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Dear Colleagues and Friends,

I couldn’t be prouder and more excited to officially welcome you to the 49th Annual Global Congress on Minimally Invasive Gynecologic Surgery (MIGS), the first virtual annual congress, November 6-14, 2020.

The "Breaking Barriers" theme for AAGL 2020 was chosen before the COVID Pandemic and is certainly timely as we each strive to become better surgeons and physicians when confronted with many barriers. The barriers we must overcome may be psychological, technical, gender, racial, communication, financial or most importantly, self-imposed. The challenges presented by the COVID Pandemic only reinforce the theme of our conference as we transition from an in-person annual congress to a virtual one.

An incredible amount of hard work has been done over the past year by the exceptional Scientific Program Committee. With the dedicated, tireless and resourceful AAGL staff, AAGL is poised to break new barriers presented by the Pandemic to bring you a Congress packed full of innovative and engaging content and educational opportunities for the novice as well as advanced gynecologic surgeons.

Prerecorded courses for registered participants are available from October 19, 2020 to April 1, 2021. Live sessions begin virtually on November 6 with thoughtful time consideration for a worldwide audience. Participants will have opportunities to engage the faculty in small group settings for the live Q&A sessions scheduled throughout the Congress.

The robust, nine day, expanded scientific program meticulously developed by the Scientific Program Committee and myself, has something for everyone. It includes 19 interactive postgraduate courses, numerous CME (continuing medical education) opportunities, 24 open communication sessions, 8 plenary sessions, 9 panel discussions, 8 surgical tutorials, chat rooms with mentoring by MIGS experts, a poster hall with narration from presenters, and a record breaking 16+ live streamed surgeries from master surgeons around the globe. The AAGL 2020 Virtual Congress is an incredible, unprecedented opportunity for learning. We are breaking barriers by providing language translation of program content in real time and removing travel, cost, and time limitations.

Three dynamic general sessions punctuate the event. The Opening Session will be anchored by the phenomenal work of Dr. Vito Chiantera as he leads us through the labyrinth of pelvic neuroanatomy. In General Session II, our keynote speaker, Dr. Carla Pugh, the highly acclaimed researcher and educator, will dramatically reshape how surgical skills can be measured and taught by presenting her groundbreaking innovations on the use of sensors, motion tracking and simulation technology. Shifting from the technical to the mental aspects of surgery, Dr. Cara King and Dr. Samar Nahas will host a round table discussion entitled, “Pushing the Surgical Envelope from Dream to Reality: Exploring the Mental Aspect of Surgery” and attempt to extract the essence of surgical mastery from legendary surgeons Dr. Javier Magrina, Dr. CY Liu and Dr. Arnaud Wattiez.

The meeting would not be complete without a lively “edutainment” session. Tune in as two generations of MIGS surgeons battle it out surgical skills style. General Session III will showcase “Stump the Professor 2020: Special Edition - The Student versus The Master “Wax On, Wax Off” to commemorate 20 years of the AAGL Fellowship.

In addition to the exciting program line up, the AAGL Virtual Congress has fun social events and an interactive virtual exhibit hall. AAGL’s Virtual Exhibit Hall is an engaging online environment with digital product booths staffed by industry representatives, LIVE product theaters and an in-booth meeting scheduler to connect attendees with the latest innovations in medical devices and technology.

Please join us at this historic, monumental congress as we transcend time and space by breaking barriers to reach the next frontier of our evolution as gynecologic surgeons.

Sincerely,

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Abstracts that were submitted for consideration for presentation and received as of May 20, 2020, are published as submitted and received at the 49th AAGL Global Congress on Minimally Invasive Gynecology. The abstracts will be presented in oral, video and virtual poster sessions.

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The Foundation of the AAGL takes great pride in presenting Signature Awards to the “best of the best” selected by our award committees. The authors of the top scoring abstracts were asked to submit a full manuscript or video for scoring by an independent committee of up to five physicians. The top scoring manuscripts and a video were selected for award and will be presented throughout the Congress.

Signature Awards will be presented live streaming in General Session II on November 7, 2020, 6:35 AM (PT) - 7:55 AM (PT)

The Foundation of the AAGL Signature Awards are supported through the generous donations received by our endowed funds and by our industry sponsors. We thank everyone who submitted their research for consideration for presentation and would like to congratulate the 2020 award winners.

**Jordan M. Phillips Endowment**  
**Best Paper on MIGS**  
*Supported by the Jordan M. Phillips Endowment*

Established in 2005 and named for the founder and inaugural President of the AAGL, this endowment provides funding for research, fellowships, and patient education. Funding for research provides AAGL's Research Committee the ability to identify key topics in need of further study for AAGL members; facilitate funding and collaboration; promote innovation; and advance research education.

**Validation of Five Gene Expression Signature for Diagnosis of Endometriosis**

Yana B. Aznaurova, MD  
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Assia A. Stepanian, MD  
Danii M. Nikitin, MSc  
Andrew V. Garazha, MSc  
Anton A. Buzdin, PhD  
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Academia of Women's Health and Endoscopic Surgery, Atlanta, Georgia  
OmicsWay Corp., Walnut, California

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**Kurt Semm Award**  
**Best Paper on Laparoscopic Surgeries**  
*Supported by the Kurt Semm Fund*

Dr. Kurt Semm, the “Father of Laparoscopy,” was an early adopter of endoscopic gynecology. Dr. Semm's legacy lives on in his eponymous medical instruments and techniques that continue to be employed by physicians to make endoscopic surgery more effective and efficient. In honor of Dr. Semm, this award is given annually to recognize the Best Abstract on Laparoscopic Surgery.

**Patterns of Recurrence After Laparoscopic and Open Abdominal Radical Hysterectomy for Cervical Cancer: A Propensity-Matched Analysis**

Giorgio Bogani, MD, PhD  
Fabio Ghezzi, MD  
Luis Chiva, MD, PhD  
Jvan Casarin, MD  
Antonino Ditto, MD  
Francesco Raspagliesi, MD  
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Jay M. Cooper Award
Best Paper on MIGS by a Current or Graduated FMIGS Fellow

Established in 2004 and named for the 26th President of the AAGL, this endowment provides an award for the best paper on minimally invasive gynecology submitted by a current or graduated FMIGS fellow within five years of their fellowship. Dr. Cooper was renowned for his clarity of vision and gift for communication. This award is a tribute to his passion for excellence in women’s healthcare, both in research and in surgical education.

Complications Following Total Laparoscopic Hysterectomies: A Cohort Study Analyzing One vs. Two-Layer Laparoscopic Vaginal Cuff Closure

Ann Peters, MD, MS
Riyas Ali, MD
Christine E. Foley, MD
Shana Miles, MD, PhD
Alexandra Buffie, MD
Suketu M. Mansuria, MD
Moulana Hospital, Perinthalmanna, India
Magee-Womens Hospital of UPMC, Pittsburgh, Pennsylvania
Mercy Medical Center, Baltimore, Maryland

Jerome J. Hoffman Award
Best Paper Submitted by a Resident or Fellow

Dr. Hoffman was an early AAGL Board member, a philanthropist, and an educator who strongly believed in supporting residents and fellows. Dr. Hoffman was enthusiastically supportive of the Foundation of the AAGL and was its first Executive Director.

Utility of Post-Hysterectomy Examinations in Detecting Cuff Dehiscence in Asymptomatic Women

Ritchie Mae M. Delara, MD
Meenal Misal, MD
Devika Das
Jennifer Talbott
Marlene Girardo, MS
Megan N. Wasson, DO
Mayo Clinic, Phoenix, Arizona
Mayo Clinic Alix School of Medicine, Scottsdale, Arizona

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Richard Farnam, MD, Peter Lotze, MD, Frank Tu, MD
Daniel F. Kott Award
Best Paper on New Instrumentation or Technology on MIGS
Supported by the Daniel F. Kott Fund

Established in 1996, this award is given annually to recognize the Best Abstract on New Instrumentation or Technology. Colonel Daniel F. Kott was a pioneer in the field of medical audiovisual technology and the first to document live surgeries by videotaping them – a unique concept in 1973! Colonel Kott practiced at Tripler Army Medical Center where the AAGL held some of its earliest meetings.

Comparing Participant-Reported Confidence During Laparoscopic Vaginal Cuff Suturing After Training with Two Laparoscopic Simulators

Emily Lin, MD
Megan Runge, MS
David Aaby, MS
Susan Duyar, MD
Jessica Traylor, MD
Kayla E. Nixon, MD, MS
Angela Chaudhari, MD
Susan C. Tsai, MD
Victor P. Trinkus, MD
Christopher Carl DeStephano, MD, MPH
Magdy P. Milad, MD, MS
Northwestern University Feinberg School of Medicine, Chicago, Illinois
Northwestern Medicine, Silver Spring, Maryland
Mayo Clinic, Jacksonville, Florida
Northwestern Memorial Hospital, Chicago, Illinois

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IRCAD Award
Excellence in Education

Honoring the best research in education by a FMIGS Fellow, the IRCAD award recognizes innovative ideas in teaching.

Laparoscopic Excision of Pericardial and Diaphragmatic Endometriosis

Dong Bach Nguyen, MD
Sebastien Gilbert, MD
Kristina Arendas, MD
Caitlin A. Jago, MD
Sukhbir Sony Singh, MD
The Ottawa Hospital, Ottawa, Ontario, Canada

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Golden Laparoscope Award
Best Surgical Video on MIGS
Supported by an Educational Grant from Olympus America, Inc.

Understanding Anterior Parametrectomy for Preventing Local and Pelvic Recurrences in Cervical Cancer - An Answer to Failure of LACC Trial

Shailesh P. Puntambekar, MD
Aditi Singh, MS
Seema Puntambekar, MD
Lakshmi Chethana Raj, DNB
Honey Chahal, MS
Galaxy Care Hospital, Pune, India

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Golden Hysteroscope Award
Best Paper on Hysteroscopy
Supported by an Educational Grant from Olympus America, Inc.

Is Diagnostic Hysteroscopy Safe for the Investigation of Type 2 Endometrial Cancer? A Retrospective Cohort Analysis

Luiz Gustavo Oliveira Brito, MD, MSc, PhD
Carolina R. Machado, MD
Cristina Laguna B. Pinto, MD, PhD
Julio C. Teixeira, MD, PhD
Daniela A. Yela, MD, PhD
University of Campinas, Campinas, Brazil

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Oral Presentations

SUNDAY, NOVEMBER 8, 2020

Plenary 1: Laparoscopy
(5:00 PM — 6:00 PM)

5:00 PM

Modern Trends in Operative Time and Outcomes in Minimally Invasive Hysterectomy

Luchrist D., 1* Brown O., 2 Kenton K., 2 Bretschneider C.E. 1, 2 Female Pelvic Medicine and Reconstructive Surgery, Duke University, Durham, NC; 1 Female Pelvic Medicine and Reconstructive Surgery, Northwestern University, Chicago, IL

*Corresponding author.

Study Objective: To describe trends in utilization of laparoscopic (TLH) and vaginal hysterectomy (TVH) for benign indications in a modern cohort of women and to evaluate whether TVH remains associated with lower operative times and postoperative complications as compared to TLH or laparoscopic assisted vaginal hysterectomy (LAVH), as prior research suggests.

Design: A secondary analysis of the National Surgical Quality Improvement Program (NSQIP) database. Route of surgery was identified by current procedural terminology code. Primary outcomes included operative time and rates of major and minor complications. Secondary outcomes included changes in route of surgery over time.

Setting: N/A

Patients or Participants: Between 2008 and 2018, 161,626 women underwent a minimally invasive hysterectomy for benign indications without concomitant procedures.

Interventions: N/A

Measurements and Main Results: Descriptive, bivariate and multivariable mixed regression analyses were used to assess differences in outcomes, controlling for sociodemographic factors and medical comorbidities. Sensitivity analyses used a propensity-score matched cohort to balance groups across time. Rates of TVH fell from 51 to 13 percent between 2008 and 2018, while TLH increased from 12 to 68 percent (p<0.0001). In multivariable analyses, TLH and LAVH were associated with lower odds of major complications (aOR 0.813 (CI: 0.750, 0.881) and aOR 0.873 (CI: 0.797, 0.957)) and minor complications (aOR 0.723 (CI: 0.676, 0.772) and aOR 0.896 (CI 0.832, 0.964)) compared to TVH. We observed a significant shrinking of the gap between TLH and TVH (p<0.0001) over the study period, though TVH has the shortest median operative time overall.

Conclusion: This analysis highlights recent shifts in rates of minimally invasive hysterectomy and brings to light a resultant shift in the complication rates associated with each surgical approach, as laparoscopic hysterectomy has lower rates of complications than vaginal hysterectomy despite longer operative times.

Plenary 1: Laparoscopy
(5:00 PM — 6:00 PM)

5:09 PM

A New Approach to Coincidental Appendectomy: The Vaginal Appendectomy

Ross W.T., 1* Harkins G.J. 1, Deimling T.A. 2, 3 Obstetrics and Gynecology, Penn State Milton S. Hershey Medical Center, Hershey, PA; 2 Penn State Milton S Hershey Medical Center, Hershey, PA

*Corresponding author.

Study Objective: The objective of this video is to describe performance of a coincidental appendectomy at time of laparoscopic hysterectomy via vaginal access. This technique, the vaginal appendectomy (VagAppy), is beneficial as it allows performance of a coincidental appendectomy and specimen retrieval through the colpotomy.

Design: This is an observational case series of coincidental appendectomies performed via conventional “straight stick” and robotic-assisted laparoscopy. Stepwise demonstration of the vaginal appendectomy technique is provided with narrated video footage.

Setting: The surgeries in this video were performed in the operating room at an academic medical center. The patients were positioned in dorsal lithotomy position, and the hysterectomies were completed using 5mm ports (straight stick hysterectomy) and 8mm ports (robotic-assisted hysterectomy).

Patients or Participants: Women electing for total laparoscopic hysterectomy for the surgical management of endometriosis or chronic pelvic pain.

Interventions: Coincidental appendectomy at time of total laparoscopic hysterectomy.

Measurements and Main Results: No analyses were completed for this video.

Conclusion: Vaginal appendectomy is a feasible and efficient technique to perform coincidental appendectomy at time of laparoscopic hysterectomy using a transvaginal approach. It allows for the appendectomy to be completed with a laparoscopic stapler using small or reduced laparoscopic ports.

Plenary 1: Laparoscopy
(5:00 PM — 6:00 PM)

5:18 PM

Laparoscopy in Pregnancy: A Primer

Stuparich M.A., 1* Nahas S., Behbehani S. Department of Obstetrics and Gynecology, University of California, Riverside, Riverside, CA

*Corresponding author.

Study Objective: To present principles and techniques for safe and efficient laparoscopic surgery during pregnancy.

Design: Stepwise demonstration of techniques with narrated video footage.

Setting: Laparoscopic surgery during pregnancy is safe and effective with an associated miscarriage rate of 1.3%. When feasible, it should be performed early in the 2nd trimester. In this video, we review key principles and techniques to safely perform laparoscopic surgery during pregnancy.

Patients or Participants: A 34-year-old female at 18 weeks 4 days gestation presents with a 7 cm ovarian mass causing right lower quadrant (RLQ) pelvic pain.

Interventions: The key principles for safe and effective laparoscopic surgery during pregnancy include:
Measurements and Main Results: The patient recovered well without any obstetrical or postoperative complications.

**Conclusion:** When performing laparoscopic surgery in pregnancy, a surgeon should remember these key perioperative modifications for a safe and efficient procedure.

**Plenary 1: Laparoscopy**

*(5:00 PM — 6:00 PM)*

**5:27 PM**

**Understanding Anterior Parametrectomy for Preventing Local and Pelvic Recurrences in Cervical Cancer - an Answer to Failure of LACC Trial**

*Corresponding author.*

**Patients or Participants:**

Patients who underwent a benign MIS hysterectomy (i.e., laparoscopic, vaginal, laparoscopic-assisted vaginal, or robotic-assisted laparoscopy) performed between July 2012 and June 2015 and received mechanical prophylaxis for thromboembolism.

**Interventions:** Patients were divided into cohorts who received mechanical prophylaxis alone (Mppx) or mechanical + pharmacologic prophylaxis (M+Pppx). Propensity score matching was used to minimize confounding due to differences in age, race, body mass index, hypertension, congestive heart failure, smoking, functional status, preoperative transfusion, preoperative anemia or thrombocytopenia, length of stay, and hospital teaching status. Outcomes evaluated in the propensity-matched cohorts were estimated blood loss, intraoperative time, postoperative blood transfusion, postoperative VTE, surgical site infection, reoperation, and readmission.

**Measurements and Main Results:** There were 1944 matched pairs of patients in the Mppx and M+Pppx cohorts. Intraoperative time was 21 minutes longer (168 minutes ± 63 min vs 189 ± 75 mins, p<0.0001) in the M+Pppx cohort. There were no significant differences in estimated blood loss (Mppx: 122cc ± 156cc vs M+Pppx: 132cc ± 179, p=0.08), postoperative transfusion (0.71% vs 0.67%, p=.74), or VTE (0.16% and 0.21%, p=.67). There were also no differences in surgical site infection, re-operation, or re-admission.

**Conclusion:** Further research is needed into the addition of pharmacologic prophylaxis to mechanical prophylaxis and its association with longer operative time for benign minimally invasive hysterectomy. Given extremely low rates of VTE in both groups and no difference detected in other significant peri-operative outcomes using a large database, it seems reasonable to question routine use of pharmacologic prophylaxis in these patients.

**Plenary 1: Laparoscopy**

*(5:00 PM — 6:00 PM)*

**5:45 PM**

**Laparoscopic Excision of a Noncommunicating Uterine Horn Pregnancy**

*Corresponding author.*

**Patients or Participants:** The patient was a 29 year old G1P0 female presenting with a live 11-week extrauterine pregnancy. Radiologic work-up with both pelvic ultrasound and MRI could not fully ascertain diagnosis. Differential diagnosis included tubal ectopic, horn pregnancy of a bicornuate uterus, interstitial pregnancy, and broad ligament pregnancy. Given this was a wanted pregnancy, intra-sac potassium chloride was not administered pre-operatively and the patient was consented for a diagnostic laparoscopy and possible removal of ectopic pregnancy.

**Interventions:** Laparoscopy

**Measurements and Main Results:** Diagnostic laparoscopy was undertaken where pelvic inspection revealed a right-sided normal appearing...
 unicorne uterus and a large left rudimentary noncommunicating horn distended by the pregnancy. The pregnancy was connected to the unicorne uterus via a thick fibrous band. This confirmed a pregnancy in a Type II-B Mullerian anomaly as per the ASRM classification system. Such pregnancies are rare ranging from 1 in 75,000-150,000.

Our video demonstrates a stepwise approach for the excision of such pregnancies including isolation of the ureter retroperitoneally, bladder dissection, use of peritoneal landmarks to ensure safe transection of the fibrous band, and use of hysteroscopic techniques such as vasopressin and advanced bipolar devices. In addition, we demonstrate a simple technique for oophorolysis where we stabilize a hypermobile ovary to the round ligament pedicle using a laparoscopic ligature device.

**Conclusion:** Rudimentary horn pregnancies are rare and pose a diagnostic challenge. Complications are common with >50% of such pregnancies presenting ruptured, thus resection is often recommended. We demonstrate that laparoscopy is a safe and feasible option to manage such pregnancies.

**Plenary 2: Endometriosis**

(5:00 PM — 6:00 PM)

**5:00 PM**

**Liver Mobilization for Right Diaphragm Surgery in Diaphragmatic Endometriosis**


*Corresponding author.

**Study Objective:** To demonstrate technique for liver mobilization as required for full exposure of the right diaphragm in severe right diaphragm endometriosis cases with associated diaphragm resection.

**Design:** N/A

**Setting:** Northwest Endometriosis and Pelvic Surgery, a subspecialty practice focused on endometriosis care in Portland, OR.

**Patients or Participants:** N/A

**Interventions:** This video demonstrates techniques for mobilization of the right side of the liver to achieve full exposure of the diaphragm in diaphragmatic endometriosis surgery

**Measurements and Main Results:** N/A

**Conclusion:** Diaphragmatic endometriosis is a relatively rare presentation of endometriosis, but will be frequently present in practices where high grade endometriosis patients are cared for. One of the largest challenges in performing diaphragm surgery is the obstruction of visualization and access to the diaphragm by the liver. Techniques for liver mobilization are well documented in heptobiliary surgery, and when employed in endometriosis surgery can reveal all areas of the right diaphragm. Full mobilization of the right liver involves section of the falciform ligament (liver to anterior abdominal wall and central diaphragm), triangular ligament (liver to right chest wall and lateral diaphragm), and coronary ligament (liver to posterior upper abdominal wall and posterior diaphragm). Section of each of these ligaments (when required) allows full access to anterior, lateral, and posterior aspects of the right diaphragm.

**Plenary 2: Endometriosis**

(5:00 PM — 6:00 PM)

**5:09 PM**

**Laparoscopic Resection of a De-Novo Retroperitoneal Endometrioma Involving the Left Ureter**

Hazen N.D., *1* Creswell M., *2* Robinson J.K., *3* Krassnow R.E., *4* MIGS - National Center for Advanced Pelvic Surgery, Medstar Washington Hospital Center, Washington, DC; *3* MedStar Georgetown Uni Hospital, Washington DC, DC; *2* MIGS - National Center for Advanced Pelvic Surgery, Medstar Washington Hospital Center, WASHINGTON, DC; *4* Assistant Professor, Department of Urology, Georgetown University School of Medicine, Washington, DC

*Corresponding author.

**Study Objective:** This video is a demonstration of the resection of a de-novo retro-peritoneal non-ovarian endometrioma involving the left ureter in a patient with no prior history of surgical disruption of the peritoneum, and no evidence of peritoneal endometriosis.

**Design:** Video demonstration of an unusual pathologic finding, as well as the surgical technique for management.

**Setting:** Laparoscopy in the hospital OR.

**Patients or Participants:** Patient is a female with chronic pelvic pain located focused on the left. A left sided pelvic mass was noted during a diagnostic laparoscopy, and pt was subsequently referred to our MIGS department for evaluation and resection.

**Interventions:** Laparoscopic resection of the patients left-sided retro-peritoneal non-ovarian endometrioma.

**Measurements and Main Results:** The successful resection resulted in a significant improvement in the patient’s pelvic pain. This was also a demonstration of retro-peritoneal endometriosis in a patient without prior disruption of the peritoneum, suggesting a hematogenous or metaplastic etiology.

**Conclusion:** Laparoscopy resulting in the safe resection of de-novo retro-peritoneal endometriosis.

**Plenary 2: Endometriosis**

(5:00 PM — 6:00 PM)

**5:18 PM**

**Robotic Resection of Deep Infiltrating Pelvic Sidewall Endometriosis and Concomitant Nephrectomy**

Benabou K., *1* Fernandez R., *2* Nagarkatti N., *3* Menderes G., *1* Department of Obstetrics, Gynecology and Reproductive Sciences, Bridgeport Hospital/Yale, Boston, MA; *2* Department of Obstetrics and Gynecology, Bridgeport Hospital/Yale New Haven Health, Bridgeport, CT; *3* Department of Obstetrics, Gynecology and Reproductive Sciences, Yale School of Medicine, New Haven, CT

*Corresponding author.

**Study Objective:** To demonstrate a surgical video wherein deep infiltrating endometriosis (DIE) was resected off the left pelvic sidewall.

**Design:** Step-by-step video demonstration of DIE resection from the external iliac vessels and the ureter.

**Setting:** Academic tertiary referral center.

**Patients or Participants:** 41-year-old female with history of endometriosis, presented with pelvic pain and left lower extremity swelling. Abdominal and pelvic imaging revealed extensive left pelvic sidewall fibrosis, resulting in compression of the external iliac vein, hydrocele and renal atrophy. Further urologic workup showed minimal to no residual function of the left kidney.

**Interventions:** Patient was taken to the operating room for resection of sidewall endometriosis and concomitant nephrectomy. Exploration of the peritoneal cavity showed that endometriosis was confined to the pelvis, heavily involving the left pelvic sidewall. The left retroperitoneum was entered and avascular spaces were elaborated. The left hydrocele and IP ligament were identified above the pelvic brim, as well as the common iliac vessels. Once proximal and distal access to the external iliac vessels were obtained, the majority of DIE was resected off the vessels. Complete resection of sidewall DIE would have led to vascular injury; therefore, the decision was made to proceed with debulking of fibrosis off the vessel surface and the remainder of the lesions inferior to the external iliac vessels. Given inability to salvage distal left ureter and non-functional kidney, concomitant left nephrectomy was performed.

**Measurements and Main Results:** The procedure and post-operative course were uncomplicated. There was significant improvement in
Parametrial Endometriosis Part 2: Clinical Diagnosis and Correlation of Medical Imaging with Laparoscopic Findings

**Study Objective:** This is the second video of a series introducing the concept of parametrial endometriosis (PE) and describing our approach to diagnosing and treating this particular disease presentation. The objective of this video is to discuss the presenting signs and symptoms associated with PE and to introduce diagnostic imaging and correlate these images with live surgical footage.

**Design:** Educational video that discusses the diagnosis and workup of PE, a specific pattern of endometriosis with a unique constellation of symptoms.

**Setting:** Compilation of anatomy schematics, diagnostic imaging, and surgical video clips from a tertiary center demonstrating the clinical and surgical findings that may be present with PE.

**Patients or Participants:** This video is part of an ongoing retrospective-prospective study that currently includes 28 patients who underwent surgical parametrectomies for the treatment of PE. Diagnostic images and surgical video segments have been extracted from such patients.

**Interventions:** Anatomy schematics, medical imaging and surgical video clips demonstrating the anatomy, clinical and diagnostic findings, and describing the infiltration patterns of PE. We then present some pictorial cases correlating the clinical, imaging and surgical findings.

**Measurements and Main Results:** PE infiltrates towards the pelvic sidewall and intrapelvic portions of the lumbosacral plexus producing sympotms such as lateral hip, sacral, groin and posterior thigh pain. It is often associated with neuropathic symptoms such as pudendal neuralgia, sciatica, urinary urgency and frequency, dischezia and proctalgia.

**Conclusion:** PE is a unique presentation of endometriosis with a specific constellation of symptoms and clinical findings. This video series introduces this concept and teaches the approach to clinical diagnosis setting the bases for the next video in the series, which describes the surgical technique and results of the Laparoscopic Nerve-Sparing Ultralateral Resection (LaNSURE) of PE.
Interventions: The vesicocervical and vesicovaginal spaces were dissected and the endometriotic lesion was individualized. The left vesicouterine ligament was isolated and the structures were individualized. The vesical arteries (superior, middle and inferior) were dissected and the first two were sectioned. The ureter artery and the ureter were individualized and isolated through dissection and sectioning of the intraligamentous connective tissue, thus, separating them from the infiltrative lesion. The lesion was removed and the bladder was sutured. The left anterior efferent bundles, coming from the inferior hypogastric plexus and originating from S2-S3-S4 (Pelvic Splanic Nerves), were identified and preserved.

Measurements and Main Results: There were no intraoperative complications. After 1 year the patient remains asymptomatic. MRI in the 3rd postoperative month showed absence of endometriotic lesion.

Conclusion: The Laparoscopic Nerve Sparing technique is safe and effective to treat bladder endometriosis infiltrating the anterior perineum.

MONDAY, NOVEMBER 9, 2020 Plenary 3: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:00 PM

Intravenous Tranexamic Acid Prior to Hysterectomy for Reduction of Intraoperative Blood Loss: A Randomized Placebo-Controlled Trial

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Study Objective: Only two prospective studies exist that investigated the use of TXA during benign hysterectomy. Our study objective was to evaluate the efficacy of a single, preoperative, intravenous (IV) dose of TXA in reducing intraoperative blood loss at the time of benign hysterectomy. We hypothesized that IV TXA would be more effective in reducing blood loss when compared to placebo.

Design: Randomized, double-blind, placebo-controlled trial.

Setting: Academic, tertiary care medical center.

Patients or Participants: Patients undergoing hysterectomy by any route, for benign indications from November 2017 through August 2019.

Interventions: Patients were consented at the preoperative visit. Consecutive patients were randomized to either the placebo-control group (100 mL of 0.9% sodium chloride solution) or the treatment group (1 g of IV TXA in 100 mL of 0.9% sodium chloride solution). Patient characteristics and perioperative data were recorded, including estimated blood loss (EBL) and preoperative and postoperative hemoglobin.

Measurements and Main Results: Interim analysis was conducted due to low study participant retention and recruitment rates. A total of 35 participants completed the study, 13 in the control group and 22 in the TXA group. Nonparametric tests were performed for statistical analysis. Median EBL was no different between groups, 200 g/dL for controls and 150 g/dL for TXA (p=0.58). The median drop in hemoglobin was 1.7 g/dL in the control group versus 1.9 g/dL in the TXA group (p=0.47). Median specimen weights were higher for the TXA group (323 g) than the control group (163 g, p=0.031). Operative time was not different between groups (p=0.53).

Conclusion: There was no significant benefit of using TXA for reduction of EBL or drop in hemoglobin. More robust study with a larger sample size is needed to validate the clinical efficacy of TXA for reducing blood loss in hysterectomy for benign indications.

4:09 PM

Can Robotic Surgery VR-Simulation Metrics be Used to Devise a Universal Proficiency Index That Would Allow Comparisons for All Users?

Simmonds C., 1 Brentnall M., 2 Lenihan J.P., 3* 1 mimic simulation, Seattle, WA; 2 OB-GYN, University of Washington, Seattle, WA

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Study Objective: Calculate a universal proficiency metric for Robotic Surgery VR simulation that will allow comparison of all users across any VR curriculum.

Design: Retrospective analysis of VR Simulation metrics.

Setting: Two training institutions.

Patients or Participants: Residents, Fellows and practicing surgeons.

Interventions: By analyzing a robotic surgery database of over 600,000 sessions using mimic simulators, we calculated Mean scores for each exercise. Those Mean scores were then normalized to 100. Subject’s scores were also averaged and normalized to 100. We called this Index score the MLearn2 Proficiency Index (MPI). Scores above 100 were better than average; Less than 100 were worse than average.

Measurements and Main Results: 17,648 sessions were analyzed (2017-2020) comparing 77 students (residents to practicing surgeons) working in 7 different curriculums. On average, each student spent 8 hours and 24 minutes on simulation, attempted 26.5 different exercises, and became proficient in 20.6 exercises per user. The MPI mean score for all participants in all curricula was an MPI of 104.9 (SD: 15.5).

13 students were 1 standard deviation below the norm with an average MPI of 80.15. This group averaged 9 hours 27 minutes each on the simulator attempting 23.46 exercises but becoming proficient in only 10.38 (47%) of them in 224 sessions. 12 students were 1 standard deviation above the norm with an average MPI of 127.05. This group averaged 6 hours 31 minutes each on the simulator attempting 29.08 exercises but becoming proficient in 27.5 (95%) of them in 196 sessions.

Conclusion: A universal skill-based performance index (MPI) was calculated and found to be a reliable tool that could be used to identify relative proficiency among students in different robotic surgery VR Simulation curriculums. An individual user’s proficiency can be utilized to identify a student’s progress in a given curriculum. Future studies of MPI will determine if machine learning can provide timely personalized feedback to the user.

4:18 PM

Patient Satisfaction with Initial Phone Call Vs. Office Visit Following Minimally Invasive Hysterectomy: A Randomized Controlled Trial

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Study Objective: The purpose of this study is to compare patient satisfaction on a 10 point scale between patients randomized to a phone call or clinic visit for the first assessment following minimally invasive hysterectomy.

Design: Eligible, consenting patients were enrolled at their preoperative visit and randomized at that time. Control patients had two office visits at 1-2 weeks and 6-8 weeks after surgery. Patients assigned to the study arm
received a phone call 1-2 weeks after surgery, followed by a scheduled visit 6-8 weeks after surgery. Patients in both arms completed the SCAHPS survey after the 6-8 week visit.

Setting: Academic Hospital.

Patients or Participants: All women 18-75 undergoing minimally invasive hysterectomy for benign indications.

Interventions: The study arm had a phone call in lieu of an office visit at 1-2 weeks following surgery. Both arms were seen in clinic 6-8 weeks after surgery and completed an SCAHPS survey at that time.

Measurements and Main Results: The primary endpoint, patient satisfaction on a 1-10 point scale was 10 for both arms. Nearly all patients in the study stated that the number of office visits was just right. There were no major complications in either group. There were 7/50 patients who experienced minor complications including UTI, readmission within 30 days, and surgical site infections; however, this was not statistically significantly different between groups (p=0.72). Patients in the study arm were more likely to have an unplanned emergency room or urgent care visit (5 vs 2); however, this did not reach statistical significance (p=0.25). Patients in the study arm were more likely to have unplanned office visits (3 vs 7), however this did not reach statistical significance.

Conclusion: Patients in both arms of this study were equally, highly satisfied. Consistent with findings in other specialties, phone calls are an acceptable and safe adjunct for postoperative assessments after MIH.

Plenary 3: Basic Science/Research/Surgical Education
(4:00 PM — 5:00 PM)

4:27 PM

Social Media in Minimally Invasive Gynecologic Surgery: What Is #Trending?
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Study Objective: Surveys report seven-in-ten Americans use some form of social media. Risks of social media platforms include spread of misinformation and information overload. Patients share and obtain health-care related information on such platforms. We aim to evaluate content and authorship of popular gynecological topics posted on Instagram.

Design: Retrospective content analysis.

Setting: Instagram.

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: A query of endometriosis, adenomyosis, fibroids, and hysterectomy yielded 237 hashtags. The top 10 and most recent 20 posts (determined by Instagram’s internal algorithm) for 10 popular hashtags were quantitatively (likes, comments) and qualitatively (content, authorship) reviewed. Posts cross-taggered with infertility, other chronic diseases; videos; or foreign language posts were excluded. The 10 most popular hashtags investigated were linked to 2,301,238 posts: #endometriosis (N=1,461,668), #endometriosisawareness (N=324,041), #fibroids (N=143,197), #adenomyosis (N=98,101), #hysterectomy (N=87,176), #endometriosiswarrior (N=52,503), #endometriosisawarenessmonth (N=47,728), #hysterectomyrecovery (N=35,124), #endometriosisucks (N=26,506), #endopain (N=25,132).

Of 300 posts evaluated, 97.3% were by non-healthcare authors (patients, 55%); 1.6% were authored by verified physicians/professional society.

Study Objective: To determine the difference in surgical complications for women with a prior cesarean section (CS) undergoing abdominal (AH), vaginal (VH) or laparoscopic (LH) hysterectomy.

Design: A population based retrospective cohort study.

Setting: Ontario, Canada.

Patients or Participants: This study included 71,599 women in Ontario, Canada with at least 1 delivery between July 1, 1991 and February 17, 2018 who subsequently underwent benign, non-gravid hysterectomy between April 1, 2002 and March 31, 2018.

Interventions: At least one CS delivery.

Measurements and Main Results: Of the 71,599 patients who met the study criteria, 10,300 (14.3%) had at least one previous CS. Among women with no previous CS, the incidence of AH, VH and LH was 53.6%, 24.1% and 22.3% respectively. For women with a previous CS, the respective incidences of hysterectomy were 71.6%, 7.9% and 20.6%.

Conclusion: This study demonstrates that a history of CS increases the risk of any surgical complication from hysterectomy significantly increased the odds of the primary outcome, any surgical complication 30 days from hysterectomy (OR=2.2 95% CI 2.02-2.4, p<0.0001) and 2 or more CS increased the risk even more (OR=3.2 95% CI 2.73-3.80, p<0.0001). Among women with at least 1 previous CS, the adjusted odds of any surgical complication from hysterectomy was significantly lower when performed by the vaginal approach compared to laparoscopic approach (OR 0.31 95% CI 0.19-0.49 p<0.0001). There was no difference in the odds of surgical complication between abdominal and laparoscopic approaches (OR 1.17 95% CI 0.92-1.49, p=0.19).

Conclusion: This study demonstrates that a history of CS increases the risk of any surgical complication from a subsequent hysterectomy regardless of surgical approach. Contrary to traditional teaching, acknowledging the limitations of this retrospective study, it also suggests that VH may be associated with less risk than either abdominal or laparoscopic approaches even in the setting of a previous CS.
Plenary 3: Basic Science/Research/Surgical Education
(4:00 PM — 5:00 PM)

4:45 PM

Validation of Five Gene Expression Signature for Diagnosis of Endometriosis

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Study Objective: To validate a complex gene expression biomarker for the diagnosis of endometriosis created based on differences between molecular signatures of endometrium from women with and without endometriosis.

Design: Prospective observational cohort study. II-1. Evidence obtained from a well-designed, controlled trial without randomization.

Setting: Department of Reproductive Medicine and Surgery at the A.I. Evdokimov Moscow State Medical and Dental University.

Patients or Participants: 50 women with endometriosis and 35 women without endometriosis (control group).

Interventions: Laparoscopic excision of endometriotic foci, hysteroscopy with endometrial sampling. RNA was isolated from all samples and stored in RNA Later. Following histologic analysis of all samples, RNA sequencing was performed using Illumina HiSeq 3000 equipment for single-end sequencing. Unique bioinformatic algorithms were validated using experimental gene expression datasets.

Measurements and Main Results: We performed gene expression analysis of a dataset containing 100 samples (50 endometrial and 50 endometriotic) of patients with endometriosis and 35 endometrial samples from patients of control group. We created several different gene expression signatures and validated them on separated groups of samples. The final gene signature was constructed with the core genes commonly shared by all preliminary signatures. This endometrial genetic signature successfully differentiated samples of endometriotic lesions from endometrial samples of healthy women (area under the ROC curve (AUC) = 0.982). The comparison of our dataset of 100 samples of endometrial and endometriotic tissue with preexisting dataset containing 120 samples of other tissues (cervix, ovary, stomach, lung) revealed high sensitivity (94%) and specificity (97%) in the ability of studied molecular signature to equally identify endometrium and endometriotic tissue of patients with endometriosis.

Conclusion: We obtained a complex genetic biomarker that could be potentially used as a basis for early diagnosis of endometriosis via utilization of endometrial biopsy.

Plenary 4: Fibroids
(4:00 PM — 5:00 PM)

4:00 PM

Tricky Diagnosis and Robot-Laparoscopic Surgical Approach of Disseminated Peritoneal Leiomyomatosis

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Study Objective: To show the challenging diagnosis and safe robotic surgical approach of a rare case of disseminated peritoneal leiomyomatosis (DPL).

Design: Sequential demonstration of investigation, diagnosis and surgical approach, with narrated video footage.

Setting: DPL is a rare disease, with just over 150 cases reported in literature. It is defined by sub peritoneal proliferation of benign smooth muscle cells nodules, macroscopically mimicking peritoneal carcinomatosis. The etiology remains unclear, but different hypotheses are raised, such as sub peritoneal mesenchymal stem cell metaplasia and iatrogenic origin after surgical approach of the fibroids. Early diagnosis and treatment are essential. Despite its usual benign behavior, DPL can rarely present malignant degeneration and therefore, a complete resection of multiple lesions is recommended.

Patients or Participants: Female, 45 years old patient.

Interventions: 1. Diagnostic laparoscopy with implant biopsies for a challenging investigation of DPL and its following robot-assisted laparoscopic approach, with key strategies to a safe performance. 2. Radical hysterectomy with bilateral salpingo-oophorectomy, omentectomy and wide pelvic peritoneal resection were performed. 3. For this complex procedure, identification and preservation of important landmarks and pelvic anatomy were mandatory, as well as removing all surgical specimen in monobloc.

Measurements and Main Results: Final pathology report: disseminated leiomyomatosis with no evidence of malignancy. Patient had a great recovery after surgery, with no complications.

Conclusion: DPL diagnosis can be tricky, due to its macroscopic similarity to peritoneal carcinomatosis and difficulty of identification in imaging exams. Moreover, robotic platform can be a helpful and safe tool to the surgical treatment of DPL and complete resection of all peritoneal lesions.

Elogolix with Add-Back Therapy in Women with Heavy Menstrual Bleeding, Uterine Fibroids, and Anemia: Subgroup Analysis of Two Phase 3 Trials

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Study Objective: Heavy menstrual bleeding (HMB) associated with uterine fibroids (UF) often leads to anemia, which may cause fatigue and weakness in affected women. This analysis evaluated clinical improvements in menstrual blood loss (MBL), anemia, and quality of life (QoL) in elagolix-treated women who had HMB, UF, and severe or mild anemia at the time of Elaris UF-1 or UF-2 study entry.

Interventions: Pooled subgroup analysis of UF-1 and UF-2, two replicate double-blind, randomized, placebo-controlled, 6-month phase 3 studies.

Setting: Outpatient.

Patients or Participants: Subgroup of premenopausal women with HMB (>80mL alkaline hematin-measured MBL/cycle), ultrasound-confirmed UF, and severe (hemoglobin [Hgb]<10.5g/dL) or mild anemia (Hgb=10.5-11.9g/dL) at study entry.

Interventions: Elagolix 300mg BID with add-back therapy (estradiol 1mg/norethindrone acetate 0.5mg QD) (elagolix+E2/NETA), compared with placebo.

Measurements and Main Results: In UF-1 and UF-2, a total of 426/591 (72%) women who received elagolix+E2/NETA or placebo had severe (n=189) or mild anemia (n=237) at study entry. Women with severe anemia had a numerically greater mean baseline MBL (301.6±204.1mL) than women with mild anemia (225.8±128.2mL). Of the elagolix+E2/NETA-
treated women with severe anemia at study entry, 74.1% met the study’s primary endpoint (had both <80 mL MBL during final month and ≥50% MBL reduction from baseline to final month), 57.4% had a Hgb increase >2g/dL from baseline to month 6, and 51.1% achieved Hgb≥12g/dL at month 6 (P<0.001 for all compared with placebo); the corresponding percentages for women with mild anemia were 74.6%, 25%, and 74.1% (P<0.01 for all compared with placebo). These improvements in MBL and anemia were consistent with mean improvements from baseline in Uterine Fibroid Symptom and Quality of Life questionnaire health-related QoL total score (severe: 38.1±2.5, mild: 40.7±1.9; indicating improved QoL) at month 6 (P<0.001 compared with placebo [severe: 8.3±3.4, mild: 9.3±2.3]).

Conclusion: Women with HMB, UF, and severe or mild anemia at study entry demonstrated clinical improvements in MBL, anemia, and QoL with elagolix+E2/NETA treatment.

Plenary 4: Fibroids (4:00 PM — 5:00 PM)

Relugolix Combination Therapy Reduced Uterine Fibroid-Associated Pain in Two Phase 3 Liberty Studies

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Study Objective: To evaluate the effect of Relugolix combination therapy (Rel-CT) on pain symptoms associated with uterine fibroids (UF) in women with heavy menstrual bleeding (HMB).

Design: LIBERTY 1 and 2 were phase 3, multinational, randomized, double-blind, placebo-controlled studies.

Setting: 80 (LIBERTY 1) and 99 (LIBERTY 2) clinical research centers globally, including North America.

Patients or Participants: Premenopausal woman (18–50 years) with ultrasound-confirmed UF and HMB (menstrual blood loss [MBL] volume of ≥80 mL/Cycle).

Interventions: Once-daily Rel-CT (relugolix 40 mg, estradiol 1 mg, nor-ethindrone acetate 0.5 mg).

Measurements and Main Results: A key secondary endpoint was the proportion of women with no/minimal (maximal pain score ≤1 on the 0–10 numerical rating scale [NRS]) during the last 35 days of treatment (Week 24/end of treatment) in the pain-evaluable population (women with maximum pain NRS ≥4 during the 35 days prior to randomization). Pain was also evaluated in subgroups of patients with moderate-to-severe pain during menstrual and non-menstrual days at baseline. Treatment comparisons were performed on pooled data from the LIBERTY 1 and 2 studies using the Cochran–Mantel–Haenszel test. In total, 277 patients in the pooled dataset were pain-evaluable (126 patients on Rel-CT; 151 on placebo). At Week 24/end of treatment, a significantly greater proportion of pain-evaluable patients in the Rel-CT group (45.2%) had no/minimal UF-associated pain during the last 35 days of treatment vs placebo (13.9%, P<0.0001). The proportions of women with no/minimal UF-associated pain during menstrual days (65.0% vs 19.3%, P<0.0001) and during non-menstrual days (44.6% vs 21.6%, P=0.0039) were significantly higher in the Rel-CT vs placebo group, respectively.

Conclusion: Over 24 weeks, once-daily Rel-CT reduced UF-associated pain, with a more pronounced effect on menstrual pain. Thus, Rel-CT improved two common symptoms (heavy menstrual bleeding and pain) associated with UF.

Plenary 4: Fibroids (4:00 PM — 5:00 PM)

Leiomyoma of the Urinary Bladder: A Curious Case and Its Surgical Approach

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Study Objective: To present a rare case and the difficult diagnosis and surgical approach of an urinary bladder fibroid.

Design: Case report for anatomical study and description of the procedure using video.

Setting: Under general anesthesia, dorsolothotomy position, arms alongside the body and legs abducted. Foley catheter was placed at the onset of the surgery.

Patients or Participants: 57, female, who had undergone total abdominal hysterectomy due to fibroids, complained of pelvic pressure pain and increased urinary frequency. Physical examination showed movable bulging in the anterior vaginal wall. MRI and Cystoscopy revealed a mass protruding into the posterior wall of the bladder. Initial hypothesis was a parasitic vaginal cuff fibroid.

Interventions: Using robot-assisted laparoscopy, we started by releasing adhesions and dissecting landmarks. Further, as the tumor localization was posterior to the bladder, we opted for identifying the vaginal cuff and dissecting the vesicovaginal space. However, the plan showed to be bloody and barely defined and the tumor seemed to be more caudal than it initially looked. At this point, a bladder tumor hypothesis was raised and we chose to try to access it transvesically, by making a cystotomy on the fundus of the bladder. As soon as we accessed the bladder and observed the tumor localization, we had to change our strategy once again, as the transvesical approach could harm the ureters on its implantation. The tumor was movable into the vagina when pushed by the laparoscopic forceps, so that our last move was percutaneously to access the tumor, through a colpotomy on the anterior vaginal wall.

Measurements and Main Results: Patient had no surgical complications. She returned asymptomatic. The histologic diagnosis: leiomyoma with no signs of malignancy.

Conclusion: Leiomyoma of the bladder accounts for 0.43% of all neoplasms of the bladder. These tumors can be treated successfully using different surgical approaches, and has a good prognosis after complete resection.

Plenary 4: Fibroids (4:00 PM — 5:00 PM)

Trends and Perioperative Outcomes across Elective Benign Hysterectomy Procedures from the ACS-NSQIP 2007-2017

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Study Objective: To delineate long-term national trends in the frequency of hysterectomy surgical routes, patient demographics, and perioperative morbidity with emphasis on extended length of stay and readmission rates.
**Design:** This retrospective cohort study evaluated 224,357 patients who underwent benign hysterectomy between 2007-2017.

**Setting:** In-patient hysterectomies performed at one of the participating hospitals in the American College of Surgeons- National Surgical Quality Improvement Program (ACS-NSQIP) database.

**Patients or Participants:** The ASC-NSQIP database was used to recognize patients who underwent an elective benign hysterectomy between 2007-2017. Patients were identified using Current Procedural Terminology (CPT) and International Classification of Disease (ICD) codes.

**Interventions:** Laparoscopic, transvaginal, and abdominal hysterectomy for benign indications.

**Measurements and Main Results:** Summary statistics were used to evaluate shifts in patient characteristics and postoperative outcomes by hysterectomy route and year of surgery. Multivariable logistic regression analysis comparing laparoscopic to transvaginal and abdominal hysterectomies was performed, adjusting for patient characteristics and operative time. Variables of interest included age, Body Mass Index (BMI), American Society of Anesthesiologists (ASA) classification, uterine weight > 250 grams, Extended Length Of Stay (ELOS) and readmission.

Our data shows that the rate of laparoscopic hysterectomy increased by more than 200% between 2007-2017 while that of transvaginal and abdominal hysterectomies decreased. Moreover, the mean age and rates of obesity amongst women undergoing hysterectomy increased steadily across all surgical routes, the sharpest increase in obesity noted amongst the laparoscopic hysterectomy group. In 2011, we noted a shift in the laparoscopic hysterectomy group, which by 2017, had 29% lower odds of the laparoscopic hysterectomy group consistently through our study period (P<0.001).

**Conclusion:** Although the benign surgical gynecology patient population is becoming increasingly complex, the risk of complications after hysterectomy is lowest when performed laparoscopically.

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**Plenary 4: Fibroids (4:00 PM — 5:00 PM)**

**4:45 PM**

**Hysteroscopic-Assisted Vaginal Myomectomy for a 12cm Fibroid: A Case Report**

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**Study Objective:** To demonstrate the importance of resecting large intracavitary fibroids using a combination of minimally invasive techniques, particularly vaginal morcellation and hysteroscopy.

**Design:** Video case presentation.

**Setting:** A major urban teaching institution. In the operating room, the patient was placed in dorsal lithotomy.

**Patients or Participants:** 22-year-old G0 with a 12 cm intracavitary fibroid causing heavy vaginal bleeding with a starting hemoglobin of 7.3 g/dL. She was a Jehovah’s Witness and would only accept a blood transfusion in the case of an absolute emergency.

**Interventions:** The patient was admitted to the hospital and underwent a gel foam uterine artery embolization preoperatively. She was also given preoperative misoprostol and tranexamic acid. She underwent a transvaginal fibroid resection was associated with a higher risk of subsequent hysterectomy compared to LNG-IUS in younger populations (mean age ≤52 years old, RR=5.26, 95% CI 1.21 to 22.91, p<0.03, 3 studies). In opposition, subsequent hysterectomy seemed to be less likely with endometrial ablation/resection compared to LNG-IUS in the treatment of premenopausal women with heavy menstrual bleeding and a normal uterine cavity. Thirteen studies were eligible (n=884 women).

**Interventions:** Endometrial ablation/resection versus LNG-IUS.

**Measurements and Main Results:** No significant differences were observed between endometrial ablation/resection and the LNG-IUS in terms of subsequent hysterectomy (primary outcome, risk ratio (RR) = 1.13, 95% CI 0.60 to 2.11, p=0.71, 12 studies), satisfaction, quality of life, amenorrhea and treatment failure. Side effects were less common in women treated with endometrial ablation/resection (p<0.001).

Mean age of the studied populations was identified as a significant source of heterogeneity in subgroup analysis (p=0.01): endometrial ablation/resection was associated with a higher risk of subsequent hysterectomy compared to LNG-IUS in younger populations (mean age ≤42 years old, RR≥5.26, 95% CI 1.21 to 22.91, p<0.03, 3 studies). In opposition, subsequent hysterectomy seemed to be less likely with endometrial ablation/resection compared to LNG-IUS in older populations (mean age >42 years old), although the reduction did not reach statistical significance (RR≤0.51, 95% CI 0.21 to 1.24, p=0.14, 1 study). Sensitivity analysis taking into account methodological quality of included studies and type of surgical devices (first and second generation) did not modify the results.

**Conclusion:** Endometrial ablation/resection and the LNG-IUS are two excellent treatment options for heavy menstrual bleeding, although younger women probably have a higher risk of eventually requiring hysterectomy following endometrial ablation.

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**Plenary 5: Hysterectomy (4:00 PM — 5:00 PM)**

**4:09 PM**

**Office Operative Hysterectomy for the Management of Retained Products of Conception**

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Study Objective: Office operative hysteroscopy (See-and-treat) allows most women with abnormal ultrasound findings suspected for retained products of conception (RPOC) to avoid the added risks of anesthesia and the inconvenience of the operating room. The aim of this study is to compare office to conventional operative hysteroscopy for the treatment of RPOC.

Design: A retrospective cohort study from January 2018 to March 2019.

Setting: Single tertiary medical care center.

Patients or Participants: All women who underwent hysteroscopy due to RPOC during the study period.

Interventions: Data were collected from women’s medical records. Primary outcome was defined as successful removal of all suspected RPOC. Data are presented as median and interquartile range.

Measurements and Main Results: During the study period, 229 women underwent hysteroscopy due to RPOC, of them 141 (61.57%) and 88 (38.43%) office and conventional operative hysteroscopy, respectively. No in-between group differences were observed in women’s age, body mass index and parity. Time interval to hysteroscopy was longer [2.13 (1.55-2.78) vs. 1.63 (1.02-1.63) month; p=0.001], and maximal diameter of the suspected finding was smaller for the office group compared to the conventional operative group [12.0 (8-20) vs. 20 (15-30) mm; p=0.001]. Positive finding rate on histoh-pathology was higher for the operative group (76.1% vs. 61.0%; p=0.02). Additional analysis comparing success (n=111) to failure (n=30) of office operative hysteroscopy, revealed that maximal diameter ≤27.5 mm had significantly higher success rate (p=0.007). This finding was supported by logistic regression analysis that found maximal diameter of the suspected finding as the only parameter associated with success rate in office operative hysteroscopy (B=0.12; p=0.001).

Conclusion: Office operative hysteroscopy is a feasible treatment option for the removal of RPOC when maximal content dimension is taken under consideration due to its association to success rate.

Plenary 5: Hysteroscopy (4:00 PM — 5:00 PM)

Comparison of Vaginal Danazol Vs Diphereline in Bleeding Control during Hysteroscopic Myomectomy in Women with Abnormal Uterine Bleeding

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*Corresponding author.

Study Objective: To compare the usefulness of vaginal danazol and diphereline in the management of intra-operative bleeding during hysteroscopy.

Design: Randomized controlled clinical trial.

Setting: University hospital.

Patients or Participants: One hundred and ninety participants of reproductive age were enrolled for operative hysteroscopy. Thirty women were excluded from the study.

Interventions: One hundred and sixty participants with submucous myomomas were allocated at random to receive either vaginal danazol (200mg BID, 30 days before surgery) or intramuscular diphereline (twice with a 28-day interval).

Measurements and Main Results: Overall, 145 patients completed the study. Severity of intra-operative bleeding, clarity of the visual field, volume of media, operative time, success rate for completion of operation and postoperative complications were investigated. In the danazol group, 78.1% of patients experienced no intra-operative uterine bleeding, and 21.9% experienced mild bleeding. In the diphereline group, 19.4% of patients experienced no intra-operative uterine bleeding, but mild, moderate and severe bleeding was observed in 31.9%, 45.8% and 2.8% of patients, respectively. The difference between the groups was significant (p<0.001). A clear visual field was reported more frequently in the danazol group compared with the diphereline group (98.6% vs 29.2%, p<0.001). The mean operative time was 10.9 min and 10.6min in the danazol and diphereline groups, respectively (p=0.79). The mean volume of infused media was 2.0l in both groups (p=0.99). The success rate was 100% for both groups with no intra-operative complications.

Conclusion: Both vaginal danazol and diphereline were effective in controlling uterine bleeding during operative hysteroscopy. However, vaginal danazol provided a clearer visual field.

Plenary 5: Hysteroscopy (4:00 PM — 5:00 PM)

Techniques for Optimizing Safe Hysteroscopic Myomectomy Using the Bipolar Resectoscope Loop

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*Corresponding author.

Study Objective: The objective of this video is to highlight the benefits of the bipolar resectoscope loop for hysteroscopic myomectomy and to review surgical techniques to optimize outcomes.

Design: Hysteroscopic mechanical morcellators have gained popularity given their ease of use. As a result, resectoscope loops are being used less frequently, resulting in less resident training with this device. Although the bipolar resectoscope loop has a steeper learning curve than mechanical morcellators, the bipolar device offers distinct advantages such as the ability to produce both cutting and coagulation tissue effects with electrosurgery. The ability to achieve electrosurgical hemostasis is unique to the resectoscope loop and may result in less blood loss, less extravasation of intrauterine distention media, and improved visibility allowing for a more efficient and safer surgery.

Setting: Patients should be in lithotomy position in the operating room. Standard hysteroscopic resectoscope setup is required.

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: In this video, we review specific surgical techniques for optimizing outcomes and safety with the bipolar resectoscope loop including the “bow and arrow” technique, identification of the fibroid anatomy (pseudocapsule plane), cold loop blunt dissection, the “push and tuck” method, and efficient electrosurgical hemostasis.

Conclusion: The bipolar resectoscope loop is an important tool that offers gynecologic surgeons a wider range of techniques for fibroid removal while still being able to achieve hemostasis. It is important to train residents to learn to use both hysteroscopic mechanical morcellators and resectoscope loops.

Plenary 5: Hysteroscopy (4:00 PM — 5:00 PM)

Obstetrics and Gynecology Resident Experience with Office Hysteroscopy Training

Michel L.,* Chudnoff S.G. Stamford Health, Stamford, CT  
*Corresponding author.
Conclusion: Despite numerous benefits of office hysteroscopy, our data demonstrates residency training in this area is lacking; leaving residents unprepared to perform this procedure after graduation. Programs should focus on increasing training in this area as majority of residents are interested in learning office hysteroscopy, but are dissatisfied with their training. Enhanced training in this area would likely lead to greater adoption of this modality in GYN practice.

Plenary 5: Hysteroscopy
(4:00 PM — 5:00 PM)

Combined Minimally Invasive Approach to Preserving Fertility in Patients with Cervical Pregnancy
Kozachenko A., 1 Arakelyan A.S., 2 Akinfiev D., 3 1 Department of Operative Gynecology, V.I Kulakov National Medical Research Center of Obstetrics, Gynecology, and Perinatology, Ministry of Health of the Russian Federation; Moscow, Russian Federation, Moscow, Russian Federation; 2 V.I. Kulakov National Medical Research Center for Obstetrics, Gynecology and Perinatology, Ministry of Healthcare of Russia, Moscow, Russian Federation; 3 V.I Kulakov National Medical Research Center of Obstetrics, Gynecology, and Perinatology, Ministry of Health of the Russian Federation; Moscow, Russian Federation
*Corresponding author.

Study Objective: Assess the feasibility of the minimally invasive methods in preserving the fertility in patients with cervical pregnancy.

Design: Canadian Task Force: Level II-2 Prospective and retrospective analysis.

Setting: Department of Operative Gynecology, V.I Kulakov National Medical Research Center of Obstetrics, Gynecology, and Perinatology, Ministry of Health of the Russian Federation; Moscow, Russian Federation.

Patients or Participants: 66 women with cervical pregnancies desiring preservation of fertility (ages 25-44 years), treated at the Department of Operative Gynecology during the past 13 years.

Interventions: Standard diagnostic clinical protocol was carried out in all patients. Patients with cervical pregnancy received intravenous methotrexate at an average of 50 mg/every 48 hours and 6 mg of intramuscular levodacrin rescue injection at 28 hours after methotrexate administration followed by resectoscopy or combined selective uterine embolization and resectoscopic approach. 2 women with massive bleeding on admission required hysterectomy.

Measurements and Main Results: The gestational age on admission ranged from 5 to 11 weeks with mean gestational age being 6.8 ± 0.8 weeks. 64 women underwent combined therapy with preoperative systemic methotrexate and resectoscopic excision. 28 of these patients had choric invasion into the cervix and required selective uterine artery embolization (SUAE), followed by resectoscopy. 2 patients with massive bleeding underwent emergent hysterectomy. Uterus preserving surgical procedures were started when a decreasing levels of β-hCG of 4000-7000 U/l were demonstrated. Bilateral SUAE was utilized in 28 cases, through the right femoral approach (12 cases) and through the right radial artery (16). The blood loss in all cases was less than 25 cc, including the ones with choric invasion.

Conclusion: The results of our study suggest that resectoscopic removal of embryos with previous cytostatic therapy with methotrexate allows for the preservation of fertility in young women with early cervical pregnancy. SUAE provides minimal operative blood loss and shorter hospital stay, and preserves reproductive potential in women with chorionic cervical invasion.

Plenary 6: Robotics
(4:00 PM — 5:00 PM)

4:00 PM

Robotic Assisted Laparoscopic Treatment of Cornual Ectopic Pregnancy
Winter M.L.*, Gynecology, Hoag Memorial Hospital Presbyterian, Laguna Hills, CA
*Corresponding author.

Study Objective: Demonstrate the treatment of a cornual ectopic pregnancy using robotic assisted laparoscopy.

Design: NA

Setting: Operating Room.

Patients or Participants: 1.

Interventions: Robotic Assisted Laparoscopy was used to treat the cornual ectopic pregnancy.

Measurements and Main Results: NA

Conclusion: Patient was sent home the same day, estimated blood loss was <25cc and there were no postoperative complications.

Plenary 6: Robotics
(4:00 PM — 5:00 PM)

4:09 PM

The Surgical Approach to Hysterectomy in a Patient with Mullerian Duct Anomaly
Stanton A.P., 1−2 Dinh T.A.A., 1 Leon M.G. 2 1 Medical and Surgical Gynecology, Mayo Clinic, Jacksonville, FL; 2 Gynecologic Surgery, Mayo Clinic Florida, Jacksonville, FL
*Corresponding author.

Study Objective: To present the key surgical steps to complete hysterectomy safely in the presence of uterine anomalies.
Design: An educational video reviewing Mullerian duct anomalies, their associated anatomic malformations, and the steps to safely complete laparoscopic hysterectomy in a patient with these anomalies.

Setting: Minimally Invasive Gynecology division at a tertiary care hospital.

Patients or Participants: N/A

Interventions: A 45-year-old female undergoing robotic-assisted laparoscopic hysterectomy with presence of Mullerian duct anomaly including proximal vaginal septum with two cervixes. Surgical intervention including the robotic localization and resection the proximal vaginal septum. Key points of surgical safety are reviewed including complete bilateral ureterolysis and ligation of the ureteric arteries at their origin.

Measurements and Main Results: N/A

Conclusion: Minimally invasive approaches can be ideal for use in a patient with a noted Mullerian duct anomaly. Identification of dual collecting ducts or additional renal anomalies is vital to complete hysterectomy safely in these patients, specifically if a uterine anomaly is not recognized prior to surgical intervention.

Plenary 6: Robotics
(4:00 PM — 5:00 PM)

4:18 PM

The Risk of Vaginal Cuff Dehiscence with Different Suture Types Following Endoscopic Hysterectomy

Behbehani S., M.S.,1,2* Salvador E. Suarez-, M.D., Kosiorek H., M.D., Yi J., M.D., Magnina J.F.,1,3* Department of Obstetrics and Gynecology, University of California, Riverside, Riverside, CA; 2Department of Obstetrics and Gynecology, Universidad Autonoma, Barcelona, Spain; 3Statistics, Mayo Clinic, Phoenix, AZ; 4Department of Medical and Surgical Gynecology, Mayo Clinic, Phoenix, AZ; 5Mayo Clinic, Phoenix, AZ

*Corresponding author.

Study Objective: To evaluate the rate of vaginal cuff dehiscence (VCD) after endoscopic hysterectomy using absorbable vs delayed absorbable suture.

Design: Retrospective cohort study.

Setting: Academic center, Mayo Clinic Phoenix, Arizona.

Patients or Participants: 586 consecutive patients undergoing endoscopic hysterectomy (499 robotic, 87 laparoscopic) with a specific cuff closure technique.

Interventions: Specific vaginal cuff closure technique with delayed absorbable (PDS and V-loc) or absorbable (Vicryl) suture.

Measurements and Main Results: The mean age was 50.8 years (SD 12.6) with a mean BMI of 30 kg/m^2 (SD 8.4). Most patients were premenopausal (59%) and 4.6% were on or had previously received chemotherapy. Of the hysterectomies performed, 75% were for benign indications, 94.5% were simple hysterectomies and 5.5% were radical hysterectomy (499 robotic, 87 laparoscopic) with a specific cuff closure technique.

Conclusion: Delayed absorbable suture is preferable for vaginal cuff closure at endoscopic hysterectomy as compared to absorbable suture. Risk factors for vaginal cuff dehiscence are younger age and lower BMI.

Plenary 6: Robotics
(4:00 PM — 5:00 PM)

4:27 PM

Transabdominal Cerclage and Timing of Removal: Cesarean Vs. Interval Laparoscopic

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Study Objective: To demonstrate the steps of transabdominal cerclage (TAC) placement and removal. The video addresses timing of removal at time of cesarean section versus interval laparoscopic removal and reviews tips and tricks for both approaches.

Design: The video describes a needle-less technique to TAC placement which avoids penetration into the cervical stroma, prevents scarring, and facilitates removal. Additionally, we describe tips and tricks to utilize while performing cerclage removal and highlight the advantages and disadvantages of TAC removal at the time of cesarean section.

Setting: The patient was placed in either dorsal lithotomy and/or supine position for the videos.

Patients or Participants: In this surgical video we present a case of a gravid woman with cervical insufficiency who required placement of a TAC. The pregnancy was uncomplicated and she had a scheduled cesarean section, tubal ligation, and TAC removal.

Interventions: Robotic-assisted TAC placement for cervical insufficiency followed by removal at time of cesarean section. Interval laparoscopic removal is also demonstrated.

Measurements and Main Results: Successful removal of TAC during cesarean section delivery was accomplished. If TAC removal at the time of cesarean section is precluded, it can be deferred to interval laparoscopic removal.

Conclusion: In placement of transabdominal cerclage, a minimally invasive approach is safe and effective. Removal of TAC at either time of cesarean delivery or with an interval laparoscopic removal is possible utilizing these surgical tips and tricks.

Plenary 6: Robotics
(4:00 PM — 5:00 PM)

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Total Transvaginal Vaginal Hysterectomy Using a Novel Robotic Approach

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*Corresponding author.

Study Objective: This technique video illustrates a novel hysterectomy procedure using a humanoid shaped robot assisted surgical system designed to combine the advantages of laparoscopic surgery, robot assisted surgery and the vaginal approach.

Design: N/A

Setting: N/A
Patients or Participants: N/A

Interventions: Total transvaginal laparoscopic hysterectomy with salpingo-oophorectomy performed with a novel robotic system. This system is an endoscopic instrument control system intended for single-site, transvaginal surgical procedures. The robot consists of two flexible snake-like robotic arms mimicking the human arm. Each end effector includes a monopolar spatula and bipolar graspers.

Measurements and Main Results: During this procedure, transvaginal access is achieved using a GYN trocar kit. The two robotic arms are inserted transvaginally into the pelvic cavity through the pouch of Douglas, under visual guidance of a laparoscopic camera which is inserted per standard transumbilical procedures. After accessing the pelvic cavity, the robotic arms are retro-flexed towards the point of entry. With this retroflexion, the arms are positioned in the pelvic cavity at an orientation comparable to those of standard, transumbilical laparoscopic instruments, thus allowing the surgeon to perform the procedure from a familiar vantage point and in a manner not possible with traditional manual vaginal tools. The surgeon controls joysticks while the robotic arms mimic the movements of the joystick. Standard uterine manipulators may be used as deemed necessary and the target organs are removed through the posterior fornix.

Conclusion: This video demonstrates how this new robotic technology enables performance of laparoscopic gynecologic procedures such as benign hysterectomy and salpingo-oophorectomy using single-site transvaginal access.

Plenary 6: Robotics
(4:00 PM — 5:00 PM)

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Robotic Assisted Hysterectomy for Delayed Placenta Percreta
Scott M.E.,* Lent S.E., Astell A.E. Gynecology Oncology, Kaiser Permanente Los Angeles Medical Center, Los Angeles, CA
*Corresponding author.

Study Objective: This is a novel approach to delayed hysterectomy in a case of placenta percreta. Abnormal placentation ranges 0.01 to 1.1% of pregnancies and is increasing in incidence due to rising cesarean delivery rates. Median estimated blood loss (EBL) ranges 2.5-7.8 liters with a median of 6.5 units of packed red blood cells (PRBCs) transfused. Management most often includes cesarean-hysterectomy at time of delivery, however, with advancements in endovascular intervention and advanced minimally invasive techniques, certain patients may be ideal for delayed surgical intervention with lower blood loss, less morbidity surgery, and more rapid recovery.

Design: Novel case description.

Setting: The patient was positioned in dorsal lithotomy position with extremities well-padded and arms tucked. A uterine manipulator was placed.

Patients or Participants: The patient was a 30-year-old G6P3 with documented placenta percreta with preterm labor and vaginal bleeding at 28 weeks five days.

Interventions: The patient underwent cesarean delivery and placental preservation at 28 weeks, EBL 1500ml, 4 units PRBCs transfused. After delivery she underwent bilateral uterine artery embolization. Her postpartum course was uncomplicated; she was discharged on postpartum day five and followed with weekly laboratory evaluations. Postpartum MRI confirmed placenta percreta at the bladder dome. On postpartum day number 41 the patient underwent a robotic assisted total laparoscopic hysterectomy, with cystotomy and repair, total EBL was 1000ml and she received 2 units of PRBCs, with discharge on POD2.

Measurements and Main Results: Total EBL between the two procedures was 2500ml, with a total of 6 units of PRBCs transfused. Combined length of stay was 7 days between the two procedures. No ureteral injury or significant surgical morbidity occurred.

Conclusion: Surgical management of delayed hysterectomy using robotic surgery may be a safer and less morbid procedure. Multidisciplinary care and planning are paramount to ensure patient selection and safety.

FRIDAY, NOVEMBER 13, 2020 Plenary 7: Urogynecology
(3:00 PM — 4:00 PM)

3:00 PM

Comparison between Delayed Absorbable and Permanent Sutures in Laparoscopic Sacral Colpopexy: A Randomized Controlled Trial
Raggiuri S.,1,2,4 Tagliapietra V.,1,2 Taccalitti C.,1,2 Gentile C.,2 Didonna T.,2 D’Asta M.,3 Legge F.,2 Guida P.,3 Scambia G.,3 Guido M.1,2,3 Department of Obstetrics and Gynecology, Catholic University of the Sacred Heart, Policlinico Agostino Gemelli IRCCS, Rome, Italy; 2Department of Obstetrics and Gynecology, General Regional Hospital “F. Miulli”, Acquaviva delle Fonti (BA), Italy; 3Department of Obstetrics and Gynecology, Presidio Ospedaliero Garibaldi-Nesina, Catania, Italy; 4General Regional Hospital “F. Miulli”, Acquaviva delle Fonti (BA), Italy *Corresponding author.

Study Objective: To demonstrate the non-inferiority of delayed absorbable sutures compared to non-absorbable sutures in laparoscopic sacrocolpopexy (LSC) for correction of pelvic organ prolapse.

Design: It is a randomized 1:1 non-inferiority surgical clinical trial (NCT03582410).

Setting: Obstetric and Gynecological Department of “Ospedale Regionale F. Miulli”.

Patients or Participants: 160 patients, who required surgical treatment for symptomatic prolapse were assessed for eligibility, 6 patients declined to participate and 4 patients did not meet inclusion criteria. 150 patients were enrolled and all completed follow up.

Interventions: Patients were randomized to receive LSC with delayed absorbable (group A: 75 patients) and non-absorbable sutures (group B: 75 patients) for anterior and posterior mesh fixation to vagina. Primary outcome was the correction of the prolapse at 1, 6 and 12 months after surgery. Intraoperative parameters, intraoperative and postoperative characteristics and long term morbidity were considered as secondary outcomes.

Measurements and Main Results: Baseline characteristics were comparable between groups. There were no differences in terms of blood loss, operation time, intraoperative complications. No cases of failure and no differences in terms of prolapse correction were observed. There was bowel symptoms gradual reduction in both groups. Rate de novo urinary incontinence and persistent urinary incontinence after 12 months was similar (respectively 7% in group A vs 5% in group B, p: 1.0 and 11% in group A vs 5% in group B, p: 0.229). Rate of mesh erosion at 12 months was higher in group A though not statistically significant (4% vs 0%, p:0.24).

Conclusion: Delayed absorbable sutures are comparable to non-absorbable sutures for mesh fixation in LSC in terms of success of procedure, operative parameters, intraoperative and postoperative characteristics. Other studies are needed to clarify if absorbable sutures can be associated to a decreased rate of mesh erosions.

Plenary 7: Urogynecology
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Nitrofurantoin Prophylaxis Following Short-Term Transurethral Catheterization: A Randomized Controlled Trial
Bastawros D,1,4 Kaczmarski K,2 Zhao J,3 Bender R,4 Myers E.M.,3 Tarr M.E.5, 1Novant Health Pelvic Health Center, Winston-Salem, NC; 2Obstetrics and Gynecology, Division of Female Pelvic Reconstructive Surgery, Atrium Health, Charlotte, NC; 3Center for Outcomes Research and Evaluation (CORE), Charlotte, NC; 4Atrium Health Investigational Drug Services, Charlotte, NC; 5Obstetrics and Gynecology, Division of Urogynecology and Pelvic Surgery, Atrium Health, Charlotte, NC
*Corresponding author.

Study Objective: To evaluate if nitrofurantoin prophylaxis following discontinuation of transurethral catheterization decreases the rate of urinary tract infection.

Design: Double-blind, Placebo controlled, Randomized trial.

Setting: Academic.

Patients or Participants: Women with postoperative urinary retention following pelvic reconstructive surgery managed with transurethral catheterization.

Interventions: Twice daily dosing of nitrofurantoin or placebo for five days following transurethral catheter removal.

Measurements and Main Results: This trial was conducted across two clinical sites between October 2017 and April 2019. Once participants passed the postoperative in-office voiding trial, they were randomized to receive oral nitrofurantoin 100mg or placebo twice daily for five days and keep a medication diary to evaluate medication compliance. The primary outcome was clinically suspected urinary tract infection (defined as dysuria, frequency, and irritation in the absence of vaginal discharge) and/or culture-proven urinary tract infection (defined as greater than 105 colony forming units of a single organism) within 30 days of surgery. Secondary outcomes included evaluation of adverse events related to study medication and study medication compliance.

Data from 164 consented participants were eligible for analysis (nitrofurantoin, n=82; placebo, n=82). There were no significant demographic and intraoperative differences between groups except for body mass index (27.1±4.7 vs 28.6±5.0 kg/m2, p=0.05) and race ([96.3% vs 87.8% Caucasian, p=0.04] vs [1.2% vs 9.8%, p=0.03]). Median duration of postoperative transurethral catheterization was 3 days (IQR 2-5 days, p=0.12).

Fifteen women in the nitrofurantoin group and 14 women in the placebo group experienced urinary tract infections within 30 days (18.3% vs 17.1%, p=0.84, odds ratio [95% CI] 1.09 [0.49-2.43]). There were no study medication allergies, however, nausea was the most common intolerance.

Most women in each group completed the study drug treatment (91.5% vs 86.4%, p=0.30).

Conclusion: Nitrofurantoin prophylaxis following removal of the transurethral catheter did not reduce risk of urinary tract infection in women with postoperative urinary retention following pelvic reconstructive surgery.

Plenary 7: Urogynecology
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Video Atlas of Cystourethroscopy Findings
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*Corresponding author.

Study Objective: The objectives of this video are to demonstrate normal findings at the time of cystourethroscopy, show examples of common benign findings within the bladder and urethra, and to show lesions that warrant additional investigation. We hope to provide examples of common benign and malignant findings to gynecologic surgeons to assist with recognition if they incidentally found.

Design: N/A

Setting: Tertiary academic hospital with a high-volume gynecologic surgery practice

Patients or Participants: The images shown in the video are taken from a variety of patients undergoing cystoscopy by two urogynecologists.

Interventions: Images were obtained at the time of surgery for educational purposes

Measurements and Main Results: This video demonstrates the equipment and steps of performing cystourethroscopy. We review examples of the following benign anatomic variants: shaggy urethral fronds, squamous metaplasia, cystitis cystica, bladder trabeculations, ureterocele, bladder diverticula, bladder wall cysts, ureteral orifice cysts, hypervascularity, duplicated collecting systems, foreign bodies, and fistulas. We also review two examples of neoplastic findings, including urothelial papilloma and papillary urothelial carcinoma.

Conclusion: Cystoscopy can be a useful procedure in the office and operating room. Gynecologic surgeons should be familiar with normal cystoscopy findings. If abnormalities are found, it is the surgeon’s responsibility to document and refer the patient for additional testing if indicated.

Plenary 7: Urogynecology
(3:00 PM — 4:00 PM)

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Perioperative Outcomes and Surgical Route of Colpopexy in Women with Prior Hysterectomy
OdulateWilliams A.,1,4 Jalloul R.J.,1 Elshatanoosy S.,1 Siddiqui G.2,3
1University of Texas Health in Houston, Houston, TX; 2Obstetrics and Gynecology, University of Texas Health in Houston, Bellaire, TX; 3University of Texas Health in Houston, Houston, TX
*Corresponding author.

Study Objective: To compare the perioperative outcomes associated with colpopexy performed in women with prior hysterectomy via different surgical approaches.

Design: This is a retrospective cohort study. The National Surgical Quality Improvement Project (NSQIP) database from 2014 to 2017 was queried for all women who underwent abdominal, laparoscopic/robotic or vaginal colpopexy. Our primary outcome was the composite morbidity (including surgical site infection, pulmonary, sepsis, thromboembolic, cardiac and renal complications). Our secondary outcomes included length of stay, readmission, reoperation and surgical complications. A multivariable logistic regression adjusting for Age, BMI, operative time and surgical approach was performed.

Setting: Hospitals participating in the NSQIP program.

Patients or Participants: Women with prior hysterectomy who underwent colpopexy via different routes.

Interventions: N/A

Measurements and Main Results: 2904 colpopexies were analyzed including 328 (11.3%) abdominal, 1576 (54.3%) laparoscopic and 1000 (34.4%) vaginal colpopexies. The abdominal approach was associated with an increased risk of the primary outcome compared to the laparoscopic and vaginal approaches (6%, 2%, 1.1%, aOR: ref, 0.32(0.18-0.57), 0.24(0.1-0.52) respectively, p<0.01). When assessing the different components of the primary outcome, superficial site infection was the most significant factor (3.3%, 1.6%, 0.9%, respectively, p<0.01). The abdominal approach was also associated with an increase in the length of stay >2 days and readmission compared to the other approaches (all p<0.01). The mean operative time was the longest in the abdominal colpopexy route compared to the laparoscopic and the vaginal routes (183.67 (74.6), 170 (67), 107(51) minutes respectively, p<0.01).

Interestingly, vaginal colpopexy was associated with a higher risk of urinary tract infection compared to the abdominal and the laparoscopic approach (5.2%, 2.7% and 3% respectively, p<0.01).

Conclusion: Laparoscopic and vaginal colpopexy performed in women with prior hysterectomy are associated with a lower rate of perioperative morbidity compared to the abdominal approach. The minimally invasive routes should be performed when feasible.
Plenary 7: Urogynecology
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Difficult Vaginal Dissection of the Anterior Cul-de-sac:
5 Key Principles
Moraes L.R., Kho R.M. 1
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*Corresponding author.

Study Objective: The rate of vaginal hysterectomy (VH) continues to decline likely due to the difficulty in performing the procedure, lack of adequate surgeon exposure and training and declining hysterectomy numbers. Dissecting the anterior cul-de-sac is a rate limiting step of the procedure due to incomplete dissection of vaginal attachments to the cervix, adhesions from previous surgeries, minimum uterus descensus and concern for bladder injuries. The objective of this video is to demonstrate 5 key surgical principles that can be used to facilitate the dissection of de anterior cul de sac. Videos from the laparoscopic approach will be brought in to emphasize these principles and techniques.

Design: N/A
Setting: N/A
Patients or Participants: N/A
Interventions: N/A
Measurements and Main Results: N/A
Conclusion: Dissection of the anterior cul-de-sac is a critical step in vaginal hysterectomy. We consider that this principles can help the surgeon to succeed: Completely excise the vaginal attachments from the cervix, incise the posterior leaf of the broad ligament, isolate uterine arteries bilaterally from posterior, dissect adhesions from lateral to the cervix, incise the posterior leaf of the broad ligament, isolate uterine arteries bilaterally from posterior, dissect adhesions from lateral to midline and morcellate to decompress and achieve anterior descensus.

Plenary 7: Urogynecology
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Tamsulosin to Prevent Urinary Retention Following Female Pelvic Reconstructive Surgery: A Multicenter Randomized Controlled Trial
Chapman G., 1, 6 Sheyn D., 1 Slopnick E., 3 Roberts K., 3 Mangel J., 5 Pollard R.R., 1 El-Nashar S., 2 Henderson J.W., 1 Hijaz A.K., 7 Mahajan S. 5
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*Corresponding author.

Study Objective: To determine if tamsulosin is effective in reducing the risk of postoperative urinary retention in women undergoing pelvic reconstructive surgery.

Design: We performed a multicenter double-blind randomized controlled trial.
Setting: Surgery for pelvic organ prolapse with or without a concomitant incontinence procedure.
Patients or Participants: All patients undergoing surgery for pelvic organ prolapse from August 2018 to March 2020 at two academic institutions were screened. Patients with a history of urinary retention requiring catheterization, sulfa allergy, or a preoperative post-void residual volume of greater than 100ml were not eligible. Participants who experienced cystotomy were excluded from analysis. A total of 132 patients were enrolled.

Interventions: Using permuted block randomization, participants were allocated to receive a 10-day course of either tamsulosin 0.4mg or placebo, beginning 3 days prior to surgery. Both patients and providers were blinded to treatment group. A standardized voiding trial was performed on postoperative day one.

Measurements and Main Results: An intention-to-treat analysis of 118 patients was performed. Patients received either tamsulosin (n=57) or placebo (n=61). Mean age was 61.2 ± 10.2 years, 86.4% were Caucasian, and 71.2% had stage 2 or 3 prolapse. Procedures included vaginal prolapse repair in 85.6%, abdominal prolapse repair in 49.2%, hysterecomy in 66.9%, and midurethral sling in 60.2%. Groups were similar in regards to demographics, pelvic organ prolapse quantification scores, baseline urinary symptoms, urodynamic parameters, and surgical details. Tamsulosin users had a significantly lower rate of urinary retention compared to placebo (8.7% vs 24.6%, p=0.03). Postoperative urinary tract infection and prolonged urinary retention requiring reoperation did not differ between groups. Variables associated with the development of postoperative urinary retention included tamsulosin use (OR 0.29, 95%CI 0.10-0.85) and American Urological Association Symptom Index score (OR 0.90, 95%CI 0.82-0.98).

Conclusion: This study supports the prophylactic use of tamsulosin to reduce the risk of postoperative urinary retention following female pelvic reconstructive surgery.

Plenary 8: Oncology
(3:00 PM — 4:00 PM)

3:00 PM

The Added Value of Sentinel Node Mapping in Endometrial Cancer
Kogan L., Matanes E., Wissing M., Mitric C., How J., Amajoud Z., Abitbol J., Yasmeen A., Lopez-ozuna V., Eisenberg N., Lau S., Salvador S., Gotlieb W.H., 1 Gynecology Oncology, McGill University, Montreal, QC, Canada; 2Division of Obstetrics and Gynecology, Shaare Zedek Medical Center, Jerusalem, Israel; 3Gynecology Oncology, McGill University, Montreal, QC, Canada; 4Obstetrics & Gynecology, McGill University, Montreal, QC, Canada; 5Department of Obstetrics and Gynecology, Shaare Zedek Medical Center, Jerusalem, Israel; 6Division of Obstetrics and Gynecology, McGill University, Montreal, QC, Canada; 7Epidemiology of cancer, McGill university, Montreal, QC, Canada; 8Division of Obstetrics and Gynecology, McGill University, Montreal, QC, Canada; 9Division of Obstetrics and Gynecology, McGill University, Montreal, QC, Canada; 10Division of Obstetrics and Gynecology, McGill University, Montreal, QC, Canada; 11Division of Obstetrics and Gynecology, McGill University, Montreal, QC, Canada; 12Division of Obstetrics and Gynecology, McGill University, Montreal, QC, Canada; 13Department of Urology, University Hospitals Cleveland Medical Center, Cleveland, OH
*Corresponding author.

Study Objective: To evaluate long-term oncological outcomes and the added value of sentinel lymph node sampling (SLN) compared to pelvic lymph node dissection (LND) in patients with endometrial cancer.

Design: During the evaluation phase of SLN for endometrial cancer, we performed LND and SLN and retrospectively compared the oncologic outcome with the immediate non-overlapping historical era during which patients underwent LND.

Setting: Tertiary gynecology oncology center.
Patients or Participants: From 2007 to 2010, 193 patients underwent LND and from December 2010 to 2014, 250 patients had SLN mapping with completion LND.

Interventions: Pelvic lymph node dissection (LND) versus sentinel lymph node sampling (SLN) followed by LND.

Measurements and Main Results: During a median follow-up period of 6.9 years, addition of SLN was associated with more favorable oncological outcomes compared to LND with 6-year overall survival (OS) of 90% compared to 81% (p=0.009), and progression free
survival (PFS) of 85% compared to 75% (p=0.01) respectively. SLN was associated with improved OS (HR 0.5, 95% CI 0.3-0.8, p=0.004), and PFS (HR 0.6, 95% CI 0.4-0.9, p=0.03) in a multivariable analysis, adjusted for age, ASA score, stage, grade, non-endometrioid histology, and LVSI. Patients who were staged with SLN were less likely to have a recurrence in the pelvis or lymph node basins compared to patients who underwent LND only (6-year recurrence-free survival 95% vs 90%, p=0.04).

Conclusion: Addition of SLN to LND was ultimately associated with improved clinical outcomes compared to LND alone in patients with endometrial cancer undergoing surgical staging, suggesting that the data provided by the analysis of the SLN added relevant clinical information, and improved the decision on adjuvant therapy.

Plenary 8: Oncology
(3:00 PM — 4:00 PM)

3:09 PM
Survival and Surgical Approach Among Women with Advanced Ovarian Cancer Treated with Neoadjuvant Chemotherapy

Peresena C.,1,*, Pyrzak A.,1 Barber E.L.1,2, Obstetrics & Gynecology, Northwestern University Feinberg School of Medicine, Chicago, IL; 2Robert H. Lurie Comprehensive Cancer Center of Northwestern University, Chicago, IL
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Study Objective: To determine the effect of surgical approach on overall survival (OS) for women with advanced, epithelial ovarian cancer (EOC) following neoadjuvant chemotherapy (NACT) and to determine sociodemographic and medical factors associated with surgical approach.

Design: Retrospective cohort study.

Setting: National Cancer Database.

Patients or Participants: Women with stage IIIC/IV EOC treated with NACT within 90 days of diagnosis followed by cytoreductive surgery (CRS) from 2010-2016.

Interventions: Primary exposure was surgical approach (MIS versus open) and was evaluated by intention to treat. Our primary outcome was OS. Associations were examined using Chi-squared tests, Wilcoxon rank sum tests and multivariable logistic regression. Survival analysis was performed with Kaplan Meier methods and Cox proportional hazards models.

Measurements and Main Results: 8,085 women were identified; 6,713 (83%) underwent open CRS and 1,372 (17%) underwent MIS. The proportion undergoing MIS after NACT increased from 2% in 2010 to 11% in 2016, a nearly 6-fold increase. There was no difference in OS between women who underwent MIS and open CRS (median OS 36.5 vs 35.2 months, HR 0.94, 95%CI 0.86-1.04). Even after adjusting for demographic and clinical variables, including age, race, ethnicity, income, education, insurance, and comorbidity score, no difference in OS was observed (HR 0.95, 95%CI 0.86-1.04). Women of older age (OR 1.35, 95%CI 1.05-1.74) and Hispanic ethnicity (OR 1.46, 95%CI 1.14-1.88) had increased odds of receiving MIS, while low income (<$38,000/year) women had decreased odds of receiving MIS (OR 0.76, 95%CI 0.58-0.99, p=0.03). Length of stay differed for patients undergoing MIS versus open CRS (3 vs 5 days, p<0.01).

Conclusion: MIS has similar survival outcomes to open CRS among women with EOC who have undergone NACT.

Plenary 8: Oncology
(3:00 PM — 4:00 PM)

3:18 PM
A Phase II Study on the Safety of Minimally Invasive Surgery Using Endoscopic Stapler to Prevent Tumor Spillage in Cervical Cancer

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*Corresponding author.

Study Objective: The Laparoscopic Approach to Cervical Cancer (LACC) trial demonstrated that patients treated with minimally invasive surgery (MIS) techniques resulted in poorer outcomes than those treated with laparotomic techniques. In order to overturn the suggestion that MIS is inferior to laparotomic techniques, we designed and are now performing a phase II study on the safety of laparoscopic or robotic radical surgery using endoscopic stapler for inhibiting tumor spillage of cervical neoplasms (SOLUTION trial).

Design: A 42-year-old patient with cervical cancer clinical stage IB3 underwent robotic radical hysterectomy, bilateral salpingo-oophorectomy, pelvic and para-aortic sentinel lymphadenectomy with additional steps to improve surgical and morbidity outcomes.

Setting: In a Trendelenburg position, the patient is placed under general anesthesia.

Patients or Participants: This study is a prospective, multi-center phase II trial recruiting patients with early-stage cervical cancer.

Interventions: Key points of the operation are as follows: First, we perform tubal ligation and vaginal tube insertion, and then intracorporeal colpotomy using an endoscopic stapler to prevent tumor spillage into the peritoneal cavity. Second, we resected the stapled vaginal stump to retrieve the tumor specimen, and then close the vaginal stump again with continuous suture. Finally, we perform washing cytology three times: after trocar site insertion, intracorporeal colpotomy, and vaginal stump closure to check tumor spillage.

Measurements and Main Results: Ten patients so far have been enrolled in this study and all have received this surgery successfully without positive washing cytology, indicating no tumor spillage during the surgery. We plan to enroll a total of 120 patients within three years.

Conclusion: This is a feasible study design that can be performed with MIS, which is why it is valuable to prove its efficacy and safety through a phase II trial in order to overcome the limitations of MIS suggested in LACC trial. (SOLUTIONClinicalTrials.gov number, NCT04370496)

Plenary 8: Oncology
(3:00 PM — 4:00 PM)

3:27 PM
Sentinel Node Mapping Vs. Sentinel Node Mapping Plus Backup Lymphadenectomy in Endometrial Cancer: 3-Year Outcome

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Study Objective: Sentinel node mapping (SLNM) has replaced lymphadenectomy for staging surgery in apparent early-stage endometrial cancer
(EC). Here, we evaluate long-term survival of two different approaches of nodal assessment in EC.

**Design:** This is a multi-institutional retrospective study evaluating long-term outcomes (at least 3 years) of EC patients having SLNM alone and SLNM followed by lymphadenectomy. In order to reduce possible confounding factors we applied a propensity-matched algorithm. Survival outcomes were assessed using Kaplan-Meier and Cox proportional hazard models.

**Setting:** Three oncologic referral centers.

**Patients or Participants:** Consecutive EC patients having minimally invasive surgical staging.

**Interventions:** Laparoscopic hysterectomy plus SLNM with or without backup lymphadenectomy.

**Measurements and Main Results:** Applying a propensity score matching algorithm we selected 180 patients having SLNM (90 SLNM vs. 90 SLNM followed by lymphadenectomy). Median follow-up time was 69 months. Overall, 10% of patients were diagnosed with positive nodes. Low volume disease was observed in 16 cases (5 micrometastasis and 11 isolated tumor cells). Patients having SLNM followed by lymphadenectomy had not a higher possibility to be diagnosed with a stage IIIC disease in comparison to SLNM alone (p=0.389). The survival analysis comparing did not show statistical differences in terms of disease-free (p=0.570, log-rank test) and overall survival (p=0.911, log-rank test) were similar between groups. No survival differences were observed also after stratification in low, intermediate and high-risk patients (p>0.20).

**Conclusion:** Our study highlighted that laparoscopic staging is safe and effective in EC. SLNM provides similar long-term oncologic outcomes than lymphadenectomy. Further evidence is warranted to assess the prognostic value of low-volume disease detected by ultra staging in patients following SLNM.

**Plenary 8: Oncology**

3:00 PM — 4:00 PM

3:36 PM

**Patterns of Recurrence after Laparoscopic and Open Abdominal Radical Hysterectomy for Cervical Cancer: A Propensity-Matched Analysis**

**Bogani G.**, **Ghezzi F.**, **Chiva L.**, **Casarin J.**, **Ditto A.**

**Raspagliesi F.**, **Fondazione IRCCS Istituto Tumori Milano, Milano, Italy; University of Insubria, Varese, Italy; University of Navarra, Navarra, Spain**

*Corresponding author.

**Study Objective:** To identify different patterns of recurrence after laparoscopic and open abdominal radical hysterectomy for cervical cancer.

**Design:** This a retrospective multi-institutional study evaluating patients with recurrent cervical cancer after laparoscopic and open abdominal surgery. In order to reduce possible confounding factors, we applied a propensity-matching algorithm.

**Setting:** Two oncologic referral centers.

**Patients or Participants:** Consecutive cervical cancer patients who developed recurrence after surgical treatments.

**Interventions:** Laparoscopic and open abdominal radical hysterectomy.

**Measurements and Main Results:** Chart of 1,058 cervical cancer patients were retrieved. The study population included 117 (14.2%) and 35 (14.9%) patients with recurrent cervical cancer who had had open abdominal and laparoscopic surgery, respectively. Applying a propensity matched comparison (1:2) we reduced the study population to 105 patients (35 vs. 70 patients having recurrence after laparoscopic and open abdominal radical hysterectomy). The groups had similar baseline characteristics. Patients having laparoscopic radical hysterectomy experienced shorter progression-free survival than patients having open abdominal procedures (median progression-free survival: 8.0 vs. 15.8 months; HR: 1.98 (95%CI: 1.32 to 2.97); p=0.005). Site-specific progression-free survival for vaginal, lymphatic and distant recurrences was similar between groups. However, patients having laparoscopy are at high risk of developing intra-pelvic recurrences and peritoneal carcinomatosis (HR: 17.9 (95%CI: 3.42 to 93.7); p=0.0006 log-rank test).

**Conclusion:** Patients having laparoscopy are at high risk of developing intra-pelvic recurrences and peritoneal carcinomatosis, due to unknown reasons (possibly due to a contamination of the pelvic area during colpotomy). Further evidence is needed in order to identify the best surgical treatment modality for cervical cancer patients.

**Plenary 8: Oncology**

3:00 PM — 4:00 PM

3:45 PM

**Robotic Radical Trachelectomy with an Abdominally Placed Vaginal Cercle**

**Tynon-Rosario J.R.**, **Khadraoui W.K.**, **Nagarkatti N.**, **Menderes G.**

**Yale University School of Medicine, New Haven, CT; Obstetrics and Gynecology, Yale New Haven Health, Bridgeport Hospital, Bridgeport, CT; Department of Obstetrics, Gynecology and Reproductive Sciences, Yale School of Medicine, New Haven, CT**

*Corresponding author.

**Study Objective:** To demonstrate a robotic radical trachelectomy where-in a vaginal purse-string suture was placed abdominally in order to contain the cervical tumor.

**Design:** A case report.

**Setting:** A tertiary referral center.

**Patients or Participants:** A 32-year-old gravida 0 presented with stage IB1 squamous cell carcinoma of the cervix. Pelvic MRI demonstrated a tumor the size of 1.5cm where the upper margin of the lesion was >2 cm from the uterine isthmus. PET/CT was without evidence of metastatic disease.

**Interventions:** The patient desired future fertility and opted for a robotic radical trachelectomy. The patient was placed in dorsal lithotomy position. No intrauterine manipulator was placed. ICG dye was injected onto cervix for delineation of pelvic sentinel lymph nodes. Bilateral pararectal, paravesical, and obturator spaces were developed after which bilateral pelvic sentinel lymph nodes were removed with negative frozen results. The uterine arteries were skeletonized and separated from their ureteral attachments. The rectovaginal and vesicovaginal spaces were developed. The bilateral paracervix were transected off. 2-0 prolene suture was utilized to place a purse-string suture onto upper vagina. The colpotomy was then performed circumferentially and cervix was amputated about 1 cm below the uterine isthmus. Trachelectomy specimen margins were negative. The upper vagina was then reconstructed to the lower uterine segment. A pediatric Foley was placed into the lower uterine segment to minimize the risk of cervical stenosis.

**Measurements and Main Results:** Robotic radical trachelectomy was performed without any complications, where-in a uterine manipulator was avoided and a purse-string suture was placed onto upper vagina to minimize tumor manipulation and prevent spillage into peritoneal cavity, respectively.

**Conclusion:** We believe that if MIS surgeons adhere to basic oncologic surgical principles, we will be able to provide our patients with proven MIS benefits without compromising oncological safety.
SAVE THE DATE

2\textsuperscript{nd} ISSA INTERNATIONAL, HANDS-ON INTENSIVE MASTER IN BASIC AND ADVANCED LAPAROSCOPIC SURGICAL ANATOMY OF THE FEMALE PELVIS AND TECHNIQUES

IN COLLABORATION WITH AAGL

VERONA, ITALY
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Open Communications 1: Laparoscopy (4:00 PM — 5:00 PM)

4:00 PM

Laparoscopic Management of Cesarean Scar Ectopic Pregnancy: A Step-By-Step Approach
Kent L.M.,1, 2 Einarsson J.I.,1 Pepin K.J.,1 Greenberg J.A.1,2 *Corresponding author.
1Obstetrics and Gynecology, The University of South Florida, Tampa, FL; 2Obstetrics and Gynecology, University of South Florida, Tampa, FL

Study Objective: The objective of this video is to present an overview of diagnosis and management of cesarean scar ectopic pregnancy and demonstrate a step-by-step approach for laparoscopic management.

Design: N/A

Setting: University teaching hospital.

Patients or Participants: N/A

Interventions: Laparoscopic resection of cesarean scar ectopic pregnancy.

Measurements and Main Results: N/A

Conclusion: Cesarean scar ectopic pregnancy is a rare type of ectopic pregnancy and is associated with risks including life threatening hemorrhage, uterine rupture, hysterectomy, and complications in future pregnancies. Minimally Invasive Surgery is a safe and feasible management option for this serious condition.

Open Communications 1: Laparoscopy (4:00 PM — 5:00 PM)

4:06 PM

Impact of Morcellation on Operative Time during Benign Laparoscopic Hysterectomy
Pepin K.J.,1, 2 Goedheijt M.J. Schreuder,1 Maghsoudlou P.,1 Einarsson J.I.,1 Greenberg J.A.1,2 *Corresponding author.
1Minimally Invasive Gynecologic Surgery, Brigham and Women’s Hospital, Boston, MA; 2Brigham and Women’s Hospital, Boston, MA

Study Objective: Estimate the impact of morcellation on operating room time during benign hysterectomy, while adjusting for other factors known to impact operative time.

Design: Retrospective cohort study.

Setting: Two medical centers in Boston, MA.

Patients or Participants: All patient undergoing laparoscopic or robotic hysterectomy for benign indications between November 2014 to December 2017.

Interventions: All patients underwent a hysterectomy by a laparoscopic or robotic, total or supracervical, approach and required morcellation for specimen removal. In all cases morcellation was manual and contained in a specimen bag. Laparoscopic hysterectomies with additional concomitant surgical procedures were excluded with the exception of salpingectomy, oophorectomy and cystoscopy. Data was collected with regards to patient demographics, surgical history, surgical indication, operative time, pathologic uterine weight and surgeon’s annual hysterectomy volume.

Measurements and Main Results: A total of 959 patients met inclusion criteria. The mean operative time in the morcellation group was 146 ± 4 minutes vs. 109 ± 2 minutes in the group not requiring morcellation (p < 0.01). Uterine weight in the morcellation group was 468 ± 22 grams vs. 213 ± 9 grams in the group not requiring morcellation (p < 0.01). Multiple linear regression was used to create a model to explain variation in operative time. When adjusted for pathologic uterine weight, history of laparotomy, body mass index, endometriosis as the surgical indication and surgeon’s annual hysterectomy volume, operative time was 32.6 minutes [95%CI 26.2 — 39.0] longer in hysterectomies that require morcellation (p <0.01). The model, with six predictors, was a significant predictor of operative time, F statistic = 85.5, p <0.01 accounted for 41% of variation in operative time.

Conclusion: Need for morcellation independently contributes to operative time when adjusting for other measures that can contribute to prolonged operating time. If intended, morcellation should be named in the operative procedure title to maximize efficiency of operative schedules.

Open Communications 1: Laparoscopy (4:00 PM — 5:00 PM)

4:12 PM

Management of Vascular Entrainment with Coexisting Fibrosis on the Sacral Nerve Roots
Selcuk N.F.T. Topbas,1, 2 Usta T.A.,1 Oral E.,1 Kale A.1 *Corresponding author.
1Gynecology and Obstetrics, Health Sciences University, Istanbul Sisli Hamidiye Efyal Training and Research Hospital, Istanbul, Turkey; 2Gynecology and Obstetrics, Acibadem Altunizade Hospital, Istanbul, Turkey.

Study Objective: To demonstrate decompression of sacral nerves from aberrant vessels and fibrous tissue located on the plexus.

Design: Video presentation of two cases.

Setting: Tertiary center specializing in advanced gynecologic surgery and neuropaevlogey.

Patients or Participants: Case 1: A 43-year-old gravidity 1 parity 1 female patient presented with dysmenorrhea, dyspareunia and pudendal pain with dysuria. Gynecological examination revealed deep infiltrative endometriosis with rectovaginal nodule and partial obliteration of pouch of Douglas. She had a history of laparoscopic endometriosis surgery with left oophorectomy and was treated with intravascular coil embolization for pelvic congestion syndrome.

Case 2: A 41-year-old gravidity 1 parity 1 female patient presented with chronic pelvic pain and left sided sciatic pain with chronic dysesthesia in the dermatome of sciatic nerve without any motor deficit of lower extremity. Gynecological examination revealed deep infiltrative endometriosis and full obliteration of pouch of Douglas. She had a history of multiple laparoscopic and laparotomic operations for endometriosis.

Interventions: Robot-assisted laparoscopic sacral nerve decompression and dissection of cul-de-sac with rectal nodule shaving (case1) and laparoscopic sacral nerve decompression and dissection of cul-de-sac (case 2).

Measurements and Main Results: Patients were evaluated at 3rd and 6th month postoperatively. Both patients report significant pain reduction with visual analog scale score.

Conclusion: Since lumbo sacral plexus is located over the sacral bone, it can be compressed easily by an abnormal structure (abnormal vessels, fibrous tissue, tumor, etc.) located on the plexus. Deep infiltrative endometriosis may affect retroperitoneal tissue by causing fibrosis. An abnormal vessel, which is located on the sacral plexus may entrap the roots much easier with coexisting fibrosis. On six months follow up the visual analog scale score of case 1 and 2 decreased from 10 to 4 and 10 to 3, respectively. Patients are still under surveillance.
Open Communications 1: Laparoscopy  
(4:00 PM — 5:00 PM)

4:18 PM

Laparoscopic Approach to the Obliterated Anterior Cul-De-Sac
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Study Objective: To review surgical principles that can be used to approach the obliterated anterior cul-de-sac. Additionally, to demonstrate application of these principles during total laparoscopic hysterectomy

Design: N/A

Setting: This procedure took place in a hospital-based operating room. Four laparoscopic ports were utilized, including a camera at the umbilicus, right and left lower quadrant ports and a suprapubic port.

Patients or Participants: The patient is a 46 year old female with complex chronic pelvic pain. Her surgical history included a prior Cesarean delivery. Ultrasound showed small 8 wk uterus with likely adenomyosis

Interventions: This video demonstrates a laparoscopic management of an obliterated anterior cul-de-sac as performed during total laparoscopic hysterectomy and bilateral salpingectomy.

Measurements and Main Results: N/A

Conclusion: Prior cesarean delivery can complicate laparoscopic hysterec- tomy. However, reliance on sound surgical principles can help ensure success. These include: Isolation and control of blood supply prior to adhesiolyis; Understanding and identifying safe spaces where anatomy is not altered by adhesive disease; Maintaining forward progress; Restoring anatomy

Open Communications 1: Laparoscopy  
(4:00 PM — 5:00 PM)

4:24 PM

Predictive Factors for Recurrence of Adnexal Torsion
Levin G., 1, 2* Meller N., 1 Komem D., 1 Cohen A., 1 Abu-Bandora E., 1 Mohr-Sasson A., 2 Cohen S., 3 Maushack R., 1 Meyer R., 1 Obstetrics and Gynecology, Hadassah Medical Center, Naale, Israel; 2Obstetrics and Gynecology, Sheba Medical Center, Ramat-Gan, Israel; 3Hadassa Medical Center, Jerusalem, Israel; 4Tel-Aviv University, Tel-Aviv, Israel; 5Department of Obstetrics and Gynecology, Sheba Medical Center, Tel-Hashomer, Ramat-Gan, Israel

*Corresponding author.

Study Objective: To investigate the predisposing factors for recurrent adnexal torsion (rAT) in patients who had surgical intervention for primary adnexal torsion (pAT).

Design: A retrospective cohort study between 2011 and 2020.

Setting: A tertiary, university affiliated medical center.

Patients or Participants: 358 women with a primary occurrence of surgically proven adnexal torsion.

Interventions: Adnexal detorsion, with adjuvant cystectomy, salpingec- tomy or salpingo-oophorectomy by laparoscopy.

Measurements and Main Results: We collected demographic and clinical characteristics, sonographic findings and laboratory results of all pAT episodes. We compared those who had experienced rAT to those who had not. The study included 358 women. Of those, 35 (9.8%) had a rAT. Women who experienced rAT were younger (mean age 26 vs. 30, p<0.01) with higher proportion of age ≤15 [Odds Ratio (OR) 95%CI 4.4(1.80-11.1)]. A history of hysterectomy was positively associated with rAT [3 (8.6%) vs. 1(0.3%), p=0.003]. Pregnancy rates during pAT were comparable between study groups. However, rAT was associated with lower gestational age at pAT (mean 9 weeks vs. 12 weeks, p=0.01) and conception by assisted reproductive technologies [OR 95%CI 6.0(1.21-29.65), p=0.02]. Clinical characteristics did not differ between groups except smaller ovarian cyst diameter in those with rAT (mean 42 vs. 59 mm. p<0.001). Laparoscopic detorsion alone was associated with rAT [OR 95%CI 2.13 (1.02-4.42), p=0.03], while a performance of cystectomy was negatively associated with rAT [OR 95% CI 0.10 (0.01-0.79), p=0.006]. On multivariate regression analysis, only age ≤15 and cyst diameter were independently associated with the risk for rAT [aOR 95% CI 5.0(1.09-23.2) and 0.68(0.50-0.93), for each 10 mm increase of cyst diameter, respectively].

Conclusion: Recurrent adnexal torsion is more common than previously thought. Younger age and smaller ovarian cyst at pAT are independently associated with the risk for future recurrence of adnexal torsion. These factors should be considered when contemplating oopheroraphy at pAT.

Open Communications 1: Laparoscopy  
(4:00 PM — 5:00 PM)

4:30 PM

Laparoscopic Transversus Abdominis Plane Block in Minimally Invasive Gynecologic Surgery
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*Corresponding author.

Study Objective: To describe an evidence-based technique for performing laparoscopic guided Transversus Abdominis Plane (TAP) block at time of minimally invasive gynecologic surgery.

Design: Narrated video demonstrating surgical technique

Setting: The patient is placed in dorsal lithotomy position then prepped and draped in sterile fashion. After establishment of pneumoperitoneum and prior to additional trocar placement, the laparoscopic guided TAP block is performed in order to decrease perioperative pain, postoperative opioid use, time to return of bowel function, and time to discharge.

Patients or Participants: N/A

Interventions: After identification of anatomic landmarks, 7-8cc of local anesthetic is injected in 6-7 lateral locations extending from the anterior superior iliac spine to the costal margin. Our local anesthetic includes 20cc liposomal bupivacaine, combined with 30cc 0.5% bupivacaine and 30cc injectable saline for 80cc total. To locate the correct plane, the needle is inserted through the abdominal wall under laparoscopic visualization until it can be seen tenting the peritoneum. After retracting the needle slightly using tactile feedback, the local anesthetic is injected between the transversus abdominis muscle and the internal oblique muscle. A gentle bulging of the tissue, called Doyle’s bulge, should be noted laparoscopically. After completion of bilateral TAP block, we proceed with the scheduled surgery.

Measurements and Main Results: N/A

Conclusion: Benefits of perioperative TAP block include decreased opioid use, quicker discharge, and faster return of bowel function at time of laparo- scopic hysterectomy. Laparoscopic TAP block has demonstrated superiority over ultrasound guided approach in a randomized controlled trial. Lastly, Liposomal bupivacaine has improved benefit when compared to plain bupivacaine when used for TAP block.

Open Communications 1: Laparoscopy  
(4:00 PM — 5:00 PM)

4:36 PM

Surgical Management of Interstitial Ectopic Pregnancy
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Canada; 3 Ottawa Hospital Research Institute, Ottawa, ON, Canada

*Corresponding author.

**Study Objective:** To demonstrate a minimally invasive surgical technique for management of interstitial ectopic pregnancy

**Design:** N/A

**Setting:** Operating room

**Patients or Participants:** Patients with interstitial ectopic pregnancy requiring surgical management

**Interventions:** Removal of interstitial ectopic pregnancy

**Measurements and Main Results:** N/A

**Conclusion:** Management of interstitial ectopic pregnancy has traditionally been performed via cornual wedge resection. We present a minimally invasive approach using a four-step process: (1) identify the location of the interstitial pregnancy, (2) utilize hemostatic measures such as vasopressin, vessel occlusion, or tranexamic acid, (3) create a circumferential linear incision over the specimen leaving a tissue pedicle, and (4) complete a double layer running closure for re-approximation and hemostasis.

Open Communications 1: Laparoscopy

(4:00 PM — 5:00 PM)

**4:42 PM**

**Predictive Variables for Postoperative Opioid Requirements Following Hysterectomy**

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5 Department of Obstetrics and Gynecology, St Michael’s Hospital, University of Toronto, Toronto, ON, Canada

*Corresponding author.

**Study Objective:** To identify predictive factors for opioid consumption following hysterectomy by determining the relationship between perioperative opioid requirements, preoperative pelvic pain scores and patient variables.

**Design:** A prospective cohort study.

**Setting:** Canadian tertiary care academic center.

**Patients or Participants:** The study included 191 women undergoing hysterectomy.

**Interventions:** Preoperatively, all patients completed the Pain Sensitivity Questionnaire (PSQ), Pain Catastrophizing Scale and the Numeric Rating Scale (NRS). Cumulative opioid consumption (COCA), calculated in oral morphine equivalents (OME), was the sum of opioid consumption recorded during three time periods; (i) intraoperatively, (ii) recovery room, and (iii) first 24-hours postoperatively.

**Measurements and Main Results:** 191 women underwent hysterectomy, 68 vaginal (36%), 91 laparoscopic assisted (48%), and 32 open (17%). The mean age and body mass index were 50 (27–77) and 27 (17-64) kg/m2, respectively. Most hysterectomies (138, 73%) were performed in premenopausal women. The majority of all hysterectomies were for benign indications (166, 87%), and 40 (21%) were pain-related. Median COCA for all hysterectomies was 75 mg OME, and median 24h postoperative COCA was 16 mg OME.

In multivariate analysis, preoperative NRS scores, PSQ minor scores, preoperative use of pain medication and an open approach were found to be significant predictors of increased COCA. Each additional point on the PSQ minor mean score and preoperative NRS score was found to be associated with an increase of 4 and 2.5 mg OME, respectively. Patients with open hysterectomy consumed 59.75 mg OME more than minimally invasive surgery patients, when all other factors were equal. Each additional preoperative pain medication was associated with a 9 mg OME increase.

**Conclusion:** Predictors of cumulative postoperative opioid requirements for hysterectomy include preoperative NRS scores, PSQ minor scores, number of preoperative pain medications, and surgical approach. This information can be used to create a predictive calculator to individualize perioperative interventions, optimize postoperative pain management, and tailor opioid use.

Open Communications 2: Endometriosis

(4:00 PM — 5:00 PM)

**4:06 PM**

**Joint Treatment of De Novo Umbilical Endometriosis with Plastic Surgery and Minimally Invasive Gynecologic Surgery**

Hamouie A., 1, 2* Brunn E., 2 Orzel J., 3 Sher S.R., 4 Robinson J.K. III.

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*Corresponding author.

**Study Objective:** The purpose of this report is to visually document the surgical steps of a novel four-flap umbilicoplasty in the treatment of primary cutaneous umbilical endometriosis.

**Design:** This is a case report and surgical video presenting information gathered from chart review. Patient consent was obtained verbally and documented in the medical record.

**Setting:** The intervention was performed in a standard operating room of a community hospital located in an urban area.

**Patients or Participants:** This patient is a 36-year-old gravida 1 para 0 who presented to MIGS with a decade long history of cyclic pain and bleeding from primary cutaneous umbilical endometriosis. Symptom control was refractory to cauterization by general gynecology. She was counseled on a joint procedure with MIGS and plastic surgery.

**Interventions:** The patient underwent diagnostic laparoscopy and resection of intraperitoneal endometrial implants with MIGS. She underwent umbilical endometriosis resection with a novel four-flap umbilicoplasty with plastic surgery. She followed up appropriately postoperatively with both surgical teams without complication.

**Measurements and Main Results:** Patient reported symptom control and satisfaction with cosmetic result. Provider noted satisfactory cosmetic result and lack of complication, including infection at the surgical site.

**Conclusion:** This video demonstrates a novel treatment approach to primary cutaneous umbilical endometriosis via four-flap umbilicoplasty. The surgery was performed jointly with MIGS and plastic surgery. Interdisciplinary collaboration was a key aspect of this patient’s care in providing symptom relief as well as a cosmetically appearing outcome.

Open Communications 2: Endometriosis

(4:00 PM — 5:00 PM)

**4:06 PM**

**Cellular Phenotyping of Endometriosis at the Single Cell Level Highlights Complex Heterogeneity**

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*Corresponding author.

**Study Objective:** To understand how endometriosis cells work and interact with the surrounding cells by looking at cellular components and biomarkers.
**Design:** In this DoD funded study, both eutopic and peritoneal ectopic tissue were collected from patients with stage III-IV endometriosis. An unbiased single cell transcriptomic (scRNAseq) approach was used to comprehensively identify all the cellular components of endometriosis lesions and their microenvironment.

**Setting:** Tissue samples were obtained in the operating room and brought to the Laboratory for its fresh processing RNA sequencing.

**Patients or Participants:** Women between 18-50 who were preoperatively diagnosed with stage III or IV endometriosis were consented prior to their scheduled laparoscopic surgery. Tissue banked samples of eutopic endometrium from “non-endometriosis patients” were used for comparison.

**Interventions:** Peritoneal endometriosis lesions and eutopic endometrium were collected during surgery from patients with stage III and IV endometriosis. These tissue samples were then used to generate scRNAseq data using a droplet based RNAseq platform (10x Genomics). Matched eutopic endometrium was also analyzed for comparison.

**Measurements and Main Results:** Our unbiased single cell approach allowed us to capture multiple cell types from ectopic, adjacent ectopic, and eutopic endometrium. We identified the major cell types composing the ectopic endometrium and its microenvironment, as well as in the adjacent peritoneum. Cell types identified within the microenvironment included T cells, B cells, macrophages, endothelial, fibroblast, muscle cells, and pericytes. We identified endometrial epithelial cells, in both ectopic and matched eutopic tissues, and their single-cell differential expression analysis revealed substantial differences in their gene expression and main differences emerged from the macrophage populations.

**Conclusion:** Precise determination of the heterogeneous cellular composition of endometriosis lesion allows for characterization of important key players, such as epithelial cells and macrophages among others, for lesion formation and evolution. With this detailed approach, we hope to establish a list of potential biomarkers, a much needed effort for endometriosis diagnosis and treatment.

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**Open Communications 2: Endometriosis**

(4:00 PM — 5:00 PM)

**4:12 PM**

Endometriosis Is Associated with Abnormal Placentaion and Surgical Morbidity at the Time of Cesarean Section

Romanski P.A.1,2,3 Bakkensen J.B.1, Anchan R.M.1, Missmer S.A.2, Carusi D.A.1,3 Department of Obstetrics, Gynecology and Reproductive Biology, Brigham and Women’s Hospital and Harvard Medical School, Boston, MA; 4Department of Obstetrics, Gynecology and Reproductive Biology, College of Human Medicine, Michigan State University, Grand Rapids, MI

*Corresponding author.

**Study Objective:** Determine whether patients with endometriosis have a greater likelihood of morbidity at cesarean section.

**Design:** Retrospective cohort study

**Setting:** Academic hospital

**Patients or Participants:** Patients with a singleton pregnancy resulting in primary cesarean delivery between 01/01/2015-12/31/2018. Women with history of surgically-confirmed endometriosis were matched 1:3 to women never diagnosed with endometriosis on delivery year and whether the cesarean was indicated for myomectomy history. Endometriosis was subcategorized into rASRM stage I/II or stage III/IV by operative findings. Composite morbidity was defined by any transfusion, hysterectomy, or organ injury at cesarean. Additional outcomes included placenta previa, accreta, total surgical time for cesarean, and time from incision to hysterotomy. Multivariable logistic regression models adjusting for age, race, gravidity, IVF conception, and operative hysteroscopy quantified odds ratios (OR) and 95% confidence intervals (CI).

**Interventions:** N/A

**Measurements and Main Results:** Study population included 384 patients (rASRM stage I/II=44, III/IV=52, no endometriosis=288). Composite morbidity was clinically and statistically significantly greater (17% versus 6%; OR=3.90, CI=1.37-11.05) for stage III/IV patients compared to women without endometriosis. The stage III/IV group also had higher odds of previa (13% versus 3%; OR=4.94, CI=1.45-17.8) and trended towards increased acccreta (11% versus 1%; OR=10.18, CI=1.85-55.88) compared to women without endometriosis. Odds of composite morbidity and abnormal placentaion were similar comparing stage I/II endometriosis patients to women without endometriosis. Time from skin to uterine incision did not differ between either endometriosis group and women without endometriosis, while stage III/IV patients were more likely to have a surgical time >1 hour (OR=2.49, CI=1.21-5.11).

**Conclusion:** Among patients who had a singleton pregnancy resulting in primary cesarean delivery, women with a history of stage III/IV endometriosis had greater odds of placenta previa, and surgical morbidity compared to patients without endometriosis. These findings suggest that one or more characteristics of rASRM stage III/IV may be related to abnormal placentaion and morbidity at cesarean delivery, and endometriosis phenotypes should be better documented and further explored.

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**4:18 PM**

Percutaneous Cryoablation of Symptomatic Abdominal Wall Endometriosis at a Military Treatment Facility

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*Corresponding author.

**Study Objective:** To describe a case of symptomatic abdominal wall endometriosis treated with cryoablation.

**Design:** Case report

**Setting:** Academic military hospital

**Patients or Participants:** A 31-year-old active duty female with one prior cesarean section reported 7 years of cyclic pain at her cesarean scar that was nonresponsive to trigger point injections or oral contraceptives. The pain resolved with leuprolide, however, it was stopped due to intolerable side effects. She was initially scheduled for excision of her abdominal wall endometriosis (AWE), but the procedure was cancelled due to a year-long military deployment.

**Interventions:** Two years later the patient presented to our facility with cyclic pain and enlarging cesarean scar mass. An MRI revealed 5.5 × 3.1cm left rectus muscle AWE. General surgery recommended against surgical excision as resection and reconstruction could impact her military readiness with a high risk of medical discharge. Interventional Radiology was consulted and recommended minimally invasive percutaneous cryoablation. Percutaneous cryoablation was performed outpatient under local and moderate sedation with ultrasound- and CT-guidance. Image-guided hydrodissection was used to protect the skin, abdominal wall, and underlying bowel from ice. Appropriate cytotoxic temperatures were monitored and achieved throughout the mass. Periodic CT evaluation confirmed the ablation margin of ice extended just beyond the tumor margin. The patient tolerated the procedure well and was discharged home same-day.

**Measurements and Main Results:** Patient noted complete resolution of pain at 6 weeks post-procedure without residual AWE on follow-up MRI.
Laparoscopic Excision of Pericardial and Diaphragmatic Endometriosis

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*Corresponding author.

Study Objective: To present a five-step approach to the excision of pericardial and diaphragmatic endometriosis by laparoscopy.

Design: Surgical video.

Setting: Academic tertiary care hospital.

Patients or Participants: 35-year-old nulliparous woman followed for chronic pelvic pain and infertility with a diagnosis of diaphragmatic endometriosis at a prior laparoscopy. Symptoms included severe chest and right shoulder tip pain, refractory to multiple medical therapies.

Interventions: Excision of pericardial and diaphragmatic endometriosis by laparoscopy.

Measurements and Main Results: This video presents the relevant anatomy, the literature surrounding pericardial and diaphragmatic endometriosis, and the approach to the surgical intervention. The laparoscopic excision of the full-thickness pericardial and diaphragmatic endometriotic lesions was successfully completed following five reproducible steps: (1) upper abdominal survey; (2) liver mobilization; (3) excision of diaphragmatic endometriosis; (4) intra-thoracic laparoscopic exploration; and (5) closure of the diaphragmatic defect.

Conclusion: While rare and challenging to diagnose and treat, pericardial and diaphragmatic endometriosis and its potentially debilitating symptomatology can be successfully managed through a multidisciplinary and stepwise surgical intervention.

Open Communications 2: Endometriosis
(4:00 PM — 5:00 PM)

4:30 PM

Laparoscopic Excision of Pericardial and Diaphragmatic Endometriosis

Nguyen D.B.,1,* Gilbert S.,2 Arendas k.,1 Jago C.A.,1 Singh S.S.1
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Open Communications 2: Endometriosis
(4:00 PM — 5:00 PM)

4:30 PM

Parametrial Endometriosis Part 1: A Correlation of Parametrial Anatomy and Disease Presentation

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Study Objective: This is the first video of a series introducing the concept of Parametrial Endometriosis (PE) and describing our approach to diagnosing and treating this particular disease presentation. The objective of this video is to discuss the anatomy and innervation of the parametrium, introduce the concept of PE and explain the presenting signs and symptoms associated to this condition.

Design: Educational video that introduces the concept of PE, a specific pattern of endometriosis with a unique constellation of symptoms.

Setting: Compilation of anatomy schematics, surgical video clips from a tertiary center, and cadaveric dissections demonstrating the anatomy in the innervation of the parametrium and its correlation with the specific symptoms and signs of PE.

Patients or Participants: This video is part of an ongoing retrospective-prospective study that currently includes 28 patients who underwent surgical parametrectomies for the treatment of PE. Video images have been extracted from such patients, as well as from cadaveric dissections performed by the senior author.

Interventions: Anatomy schematics and surgical and cadaveric dissection video clips demonstrating the anatomy and innervation of the parametria, describing the infiltration patterns of PE and correlating the anatomy with the clinical features of this disease presentation.

Measurements and Main Results: PE infiltrates towards the pelvic sidewall and intrapelvic portions of the lumbosacral plexus producing symptoms such as lateral hip, sacral, groin and posterior thigh pain. It is often associated with neuropathic symptoms such as pudendal neuralgia, sciatica, urinary urgency and frequency, dyschezia and proctalgia.

Conclusion: PE is a unique presentation of endometriosis with a specific constellation of symptoms. This video series introduces this concept and sets the fundamental anatomic bases for the next videos in the series, which describe the diagnosis, as well as the surgical technique and results of the Laparoscopic Nerve-Sparing Ultralateral Resection (LaNSURe) of PE.

Open Communications 2: Endometriosis
(4:00 PM — 5:00 PM)

4:36 PM

Laparoscopic Ureterolysis in the Setting of Endometriosis

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*Corresponding author.

Study Objective: This video presentation will review the medial and lateral approaches to ureter identification and illustrate surgical techniques to perform a laparoscopic ureterolysis in cases of endometriosis and retroperitoneal fibrosis.

Design: Stepwise demonstration of advanced laparoscopic surgical techniques with narrated video footage.

Setting: Ureteral identification is crucial in the setting of advanced endometriosis when performing a laparoscopic hysterectomy. Retroperitoneal fibrosis as a result of endometriosis can make ureterolysis challenging. Associated risks can include ureteral transaction with improper identification in the retroperitoneum, unrecognized or delayed thermal injury to the ureter due to aggressive electrocautery use or incomplete resection of endometriosis surrounding the ureter.

Patients or Participants: Two patients with endometriosis requiring ureterolysis who underwent laparoscopic hysterectomy.

Interventions: Identification of the ureter and laparoscopic ureterolysis can be safely performed in the setting of endometriosis with several key strategies:

1. Use of the medial and lateral approaches to ureter identification, which may be facilitated by the placement of a preoperative ureteral stent when dense retroperitoneal fibrosis is present
2. Minimizing risk of thermal injury by use of directed blunt dissection with the “open and spread” and “hook” techniques
3. Use of reliable anatomic landmarks such as the medial umbilical ligament and development of the paravesical and pararectal spaces to aid in retroperitoneal dissection
4. Meticulous attention to hemostasis to include control of both small vessels in retroperitoneal aerolar tissue and ligation of the ureter at the origin to maintain adequate visualization.

Measurements and Main Results: N/A

Conclusion: In patients with advanced endometriosis, ureterolysis is often necessary given extensive retroperitoneal fibrosis and inherent risk of ureteral injury. An intimate knowledge of anatomic landmarks, directed blunt and sharp dissection techniques, judicious use of cautery and careful hemostasis may allow for safe and effective completion of a laparoscopic ureterolysis in complex cases.

Open Communications 3: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:00 PM

Comparing Proficiency of Laparoscopic Vaginal Cuff Suturing in Naive Learners after Training with Two Different Laparoscopic Simulators

Lin E.,1 Runge M.,1 Aaby D.,2 Traylor J.,2 Nixon K.E.,1 Chaudhari A.,1 Tsai S.C.,1 Trinkus V.P.,1 DeStephano C.C.,1 Milad M.P.1,1 Department of Obstetrics and Gynecology, Division of Minimally Invasive Gynecologic Surgery, Northwestern University Feinberg School of Medicine, Chicago, IL;2 Department of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL;3 Department of Obstetrics and Gynecology, Division of Minimally Invasive Gynecologic Surgery, Northwestern Medicine, Silver Spring, MD, United States;4 Minimally Invasive Gynecology Surgery, Mayo Clinic College of Medicine and Science, Jacksonville, FL

*Corresponding author.

Study Objective: To determine if a gynecology-specific laparoscopic simulation trainer better prepares learners to perform a gynecologic surgical task than the current standard laparoscopic simulation trainer.

Design: Randomized controlled trial incorporating block randomization and a masked design.

Setting: Participants were trained and tested during a four-hour session in the Northwestern Center for Advanced Surgical Education simulation lab.

Patients or Participants: 45 surgically naive premedical and preclinical medical students were recruited from June-November 2019.

Interventions: Participants were randomized into two laparoscopic simulator groups — Essentials in Minimally Invasive Gynecology (EMIG) or Fundamentals of Laparoscopic Surgery (FLS) — then underwent training on relevant simulation tasks for 2.5 hours.

Measurements and Main Results: Participants completed a video-recorded pre-test and post-test on a laparoscopic vaginal cuff suturing model. Videos were then masked to simulator group and test phase (pre-/post-test). High-volume minimally invasive gynecologic surgeons graded the videos using a modified version of the Global Operative Assessment of Laparoscopic Skills (GOALS) tool. Composite GOALS scores were compared using two sample t-tests with unequal variances. The mean difference between post- and pre-composite GOALS scores was 6.50 for EMIG and 4.07 for FLS, p=0.34. Differences in individual GOALS domains were compared using Wilcoxon Rank-Sum tests. The mean EMIG post-pre difference was greater for six of eight individual GOALS domains, though all p-values >0.05. A post-hoc power analysis revealed n=127 per simulation group was needed to obtain p-value=0.05.

Conclusion: Neither EMIG nor FLS was associated with better performance on the vaginal cuff suturing task with regard to statistical significance. However, when examining the raw data, EMIG-randomized participants had a larger mean difference between post- and pre-test GOALS scores across multiple domains. These results suggest that EMIG may better prepare surgically naive learners to complete a laparoscopic vaginal cuff suturing task; however, larger studies are needed to demonstrate this conclusively.

Open Communications 3: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:06 PM

Engaging the Opioid Epidemic Head on: Improving Proper Disposal of Unused Opioid Medications after Surgery

Haverland R.,1,4 Luckritz T.,4 Lim E.,2 Baras M.,3 Yi J.1, 1Gynecologic Surgery, Mayo Clinic Arizona, Phoenix, AZ;2Investigational Pharmacy Services, Mayo Clinic Arizona, Phoenix, AZ;3Department of Health Sciences Research, Mayo Clinic Arizona, Scottsdale, AZ;4Department of Health Research, Mayo Clinic Arizona, Scottsdale, AZ

*Corresponding author.

Study Objective: To improve proper opioid disposal rates after surgery by providing educational materials along with a disposal bag.

Design: Prospective Cohort

Setting: Academic

Patients or Participants: Surgical

Interventions: A prospective cohort study first evaluating a baseline understanding of medication disposal using a questionnaire was given. Subsequently, patients were provided written information on proper disposal and medication disposal bag. Study patients were then asked to complete a survey about how they disposed of their unused opioids at their last visit. The success of education and proper disposal of opioid medications were evaluated.

Measurements and Main Results: Thirty-one patients successfully completed both surveys. The surgeries performed included a variety of gynecologic procedures. Prior to education, 52%(n=16) of patients did not dispose of their narcotics. Furthermore, 71%(n=22) of patients state they had never been educated by a medical provider regarding appropriate disposal. 19% (n=6) confirmed they have used a narcotic medication prescribed to someone else. After intervention, 93.5%(n=29) of patients properly disposed of their narcotics which identifies a 45% increase in proper disposal (p<0.001). In our study alone, 477 tablets of 5mg oxycodone were properly disposed. Without education and a simple option for disposal, 228 tablets prescribed would have been subject to inappropriate diversion.

Conclusion: This study clearly shows that patient education, coupled with a reliable option for opioid disposal, is effective. We encourage other institutions to implement similar practices not only for our surgical patient’s safety but also the estimated 42,000 patients who died of opioid abuse in the last year.

Open Communications 3: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:12 PM

Utility of Post-Hysterectomy Examinations in Detecting Cuff Dehiscence in Asymptomatic Women

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*Corresponding author.

Study Objective: To determine detection rates of cuff dehiscence in asymptomatic women at the 6-week post-hysterectomy examination.

Design: Retrospective cohort

Setting: Tertiary care academic institution

Patients or Participants: 2168 women who underwent hysterectomy over a seven-year period

Interventions: Routine evaluation of vaginal cuff by pelvic examination

Measurements and Main Results: 2051 women were included in the final analysis. 117 women were excluded due to no documented post-hysterectomy
visit (5.7%). There were 1642 women (80.1%) who were asymptomatic at the 6-week post-hysterectomy examination who others endorsed vaginal bleeding (n=122, 5.9%), vaginal discharge (n=101, 4.9%), pelvic pain (n=97, 4.7%) or a combination of symptoms (n=89, 4.4%). Of the asymptomatic women, 1419 had normal findings (90.1%) on exam, 129 demonstrated granulation tissue (8.2%), 68 had no pelvic exam performed (4.8%), 24 had vaginal discharge (1.5%), 2 had partial cuff dehiscence (0.1%), and 0 had complete cuff dehiscence (0%). Irrespective of time, the total rate of complete cuff dehiscence in this cohort was 0.6% (n=13). Of the patients that developed a cuff dehiscence, at the 6 week exam all were noted to have an intact cuff, 9 patients were asymptomatic and 3 were symptomatic (vaginal bleeding n=1, pelvic pain n=2). One patient presented with dehiscence before her 6 week post-hysterectomy exam. Median time to cuff dehiscence was 106±5.6 weeks (range 51−119) for the cohort, 18.8±0.15 weeks (range 51−19.1) for benign hysterectomy, and 81.6±26.7 weeks (range 54−119) for oncologic hysterectomy. Patients with dehiscence following hysterectomy for benign indications presented with symptoms of pelvic pain and vaginal bleeding at the time of dehiscence, while those who had hysterectomy for oncologic indications were more likely to present with unprovoked dehiscence and without symptoms.

Conclusion: Performing a pelvic examination at the 6-week post-hysterectomy visit did not negate risk for future complete cuff dehiscence. Routine 6-week post-hysterectomy pelvic examinations in asymptomatic women may not be necessary.

Open Communications 3: Basic Science/Research/Surgical Education
(4:00 PM — 5:00 PM)

4:18 PM
Rapid Referral for Iron Infusion in Gynecological Patients
Ulrich A.P.,1,4 Katcher A.,1 Comfort L.,1 Plummer M.,2 Xie X.,3 Fazzari M.,1 Chaitowitz; M.,4 Luts H.K. Yettaw1, OB/GYN (Minimally Invasive Gynecologic Surgery), Montefiore Hospital/Albert Einstein College of Medicine, Bronx, NY; Albert Einstein College of Medicine, Bronx, NY; Department of Epidemiology & Population Health, Albert Einstein College of Medicine, Bronx, NY; Hematology, Montefiore Hospital/Albert Einstein College of Medicine, Bronx, NY
*Corresponding author.

Study Objective: An IV iron rapid referral pathway (IVIRRP) was established as an electronic-medical record (EMR)-based protocol in collaboration with Hematology, to expedite delivery of IV iron to anemic patients undergoing benign hysterectomy. We evaluated the effect of the IVIRRP on the rates of preoperative anemia, referrals for IV iron, rates of transfusion, and time from referral to infusion.

Design: Quality improvement intervention study

Setting: Academic medical center

Patients or Participants: 278 patients in the pre- and 250 patients in the post-intervention cohort.

Interventions: Gynecologic surgeons were provided with guidelines for implementing the IVIRRP. Referrals were reviewed by a hematologist who coordinated IV iron infusion.

Measurements and Main Results: Baseline anemia, defined as a hemoglobin (Hb) < 12, was similar in the pre- and post-intervention groups (47.7% vs. 47.8%). In the pre-intervention group 8.3% of anemic patients were referred to hematology vs 42% post-intervention (p-value < 0.0001). The rate of IV iron infusion was 12.1% pre- and 33.6% post-intervention (p-value < 0.001). The median time from initial gynecologic visit to hematology was reduced from 28 to 14.5 days, and the time from hematology to administration of IV iron was reduced from 7.5 to 5 days. The prevalence of anemia prior to surgery was not changed, however a significant rise in Hb was observed in anemic patients; 1.2 g/dL pre- vs 1.9 g/dL post-intervention (p-value 0.01). The post-intervention intra-and post-operative transfusion rate was 2.5%, compared to 5.3% in the pre-intervention group (p-value 0.34). In the post-intervention group there was a significant increase in the number of patients who received oral iron, IV iron, or medical management (p-value 0.02).

Conclusion: Implementation of an EMR-based, multidisciplinary, rapid referral protocol for anemic patients pre-operatively increases the rate of referral for IV iron, expedites delivery of IV iron, and results in increased pre-operative hemoglobin and decreased rates of transfusion.

Open Communications 3: Basic Science/Research/Surgical Education
(4:00 PM — 5:00 PM)

4:24 PM
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*Corresponding author.

Study Objective: To investigate the utility of a gynecologic laparoscopy simulation curriculum designed for mid-level obstetrics and gynecology (OB/GYN) residents in the five Fundamentals of Laparoscopy Surgery (FLS) skills. The hypothesis was that residents would demonstrate significant improvement in all tasks.

Design: A cohort study.

Setting: A community based OB/GYN residency education program.

Patients or Participants: A total of 51 2nd and 3rd year residents.

Interventions: A comprehensive, 10 – week-long gynecologic endoscopy program, comprising both cognitive and manual skills. After an orientation week, formal assessment of baseline time and accuracy for each of the 5 FLS exercises was obtained on each resident by an FLS-certified faculty. Each week thereafter comprised a 3-hour training session with the same faculty that included approximately 90 minutes of hands-on psychomotor training using the FLS Laparoscopic System. All residents had 24 hour a day access to a training facility. On week 9, formal testing was repeated by the same faculty and the data entered into an Excel database.

Measurements and Main Results: There were 51 residents in the 10-year period and between 38 and 46 pairs of data for the 5 skills were evaluable. The baseline and week 9 completion times in seconds (SD) were as follows: Peg transfer 90.8 (40.1) and 59.4 (20.5); Pattern cut 190.7 (87.9) and 113.8 (51.0); Ligating loop 92.1 (39.6) and 65.1 (31.2); Extracorporeal tie 230.9 (88.3) and 137.8 (42.2); Intracorporeal tie 249.3 (97.9) and 134.1 (69.5). All differences were significant P < .001

Conclusion: Mid-level OB/GYN residents exposed to this gynecologic laparoscopy simulation training program significantly improved performance in the five FLS skills. Consequently, it may serve as a model for residency training programs. However, the absence of a cognitive and psychomotor hysteroscopic component in FLS is noteworthy and a shortcoming for OB/GYN training programs.

Open Communications 3: Basic Science/Research/Surgical Education
(4:00 PM — 5:00 PM)

4:30 PM
Effects of Implementation of Ergonomic Training on Reported Surgeon Musculoskeletal Pain: A Systematic Review.
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Study Objective: This study evaluates the current state of minimally invasive gynecologic surgery as perceived by residents, with a focus on the role of minimally invasive gynecologic surgery in pelvic surgeons. If we do not know what we are looking for, nor what we are expecting to find, we are exposing our patients to great risk. The overestimation of lesion extent and the underestimation of lesion extent - as various subtypes of cancers and endometriosis, affecting the ureter, vessels, colon, diaphragm, bladder, nerves and many other structures - that now need to be also mastered by pelvic surgeons. If we do not know what we are looking for, nor what we have found, we are exposing our patients to great risk. The overarching goal must always be to combine anatomical knowledge with technical and tactical training.

Open Communications 3: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:42 PM

Surgical Anatomy Masterclass
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Study Objective: Review the major anatomical landmarks of a laparoscopic surgical procedure - emphasizing the fundamentals of the deep pelvic anatomy, a required knowledge for any pelvic surgeon.

Design: A compilation of laparoscopic surgical videos were used to elaborate a both instructional and clear mapping of the major anatomical structures that must be mastered by any pelvic surgeon.

Setting: With the improvement of diagnostic technologies, deeper and more intricate lesions are detected. This requires surgeons to elevate their anatomical knowledge, both to avoid unwanted damage and provide a more reliable treatment to patients. Superficial treatments were once accepted in these situations; however, we know now much more about invasive lesions - as various subtypes of cancers and endometriosis, affecting the ureter, vessels, colon, diaphragm, bladder, nerves and many other structures - that now need to be also mastered by pelvic surgeons. If we do not know what we are looking for, nor what we have found, we are exposing our patients to great risk. The overarching goal must always be to combine anatomical knowledge with technical and tactical training.

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: N/A

Conclusion: In summary, a comprehensive review of the laparoscopic surgical anatomy was elaborated - serving as a pivotal resource for the learning process of pelvic surgeons.

Open Communications 4: Fibroids (4:00 PM — 5:00 PM)

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Perioperative Antibiotic Prophylaxis in Myomectomy Surgery
Banerjee D.1,6* Dejbakhsh S.1, Patel H.H.1, Chang J.1, Goldrath K.E.1, Yu S., Havard A.1, 2OB/GYN, University of California Los Angeles, Los Angeles, CA; 2Hoag Memorial Hospital Presbyterian, Irvine, CA *Corresponding author.

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Design: A compilation of laparoscopic surgical videos were used to elaborate a both instructional and clear mapping of the major anatomical structures that must be mastered by any pelvic surgeon.

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Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: N/A

Conclusion: In summary, a comprehensive review of the laparoscopic surgical anatomy was elaborated - serving as a pivotal resource for the learning process of pelvic surgeons.
Study Objective: We aim to evaluate antibiotic use in myomectomy surgeries and its association with the incidence of surgical site infection (SSI).

Design: A retrospective cohort study design.

Setting: Two university-affiliated hospitals in Los Angeles.

Patients or Participants: The cohort includes 1177 women who underwent either laparoscopic or abdominal myomectomy between February 2013 – December 2017.

Interventions: We collected information regarding patient demographics, antibiotic use, surgical findings, and SSI outcomes.

Measurements and Main Results: Antibiotics were used in 907 (76.9%) cases. Laparoscopic myomectomy was performed in 620 (53%) cases and open myomectomy in 563 (48%) cases. Thirty-four cases (2.9%) had SSI within a 6-week postoperative period. Univariate analyses were used to compare the control group without antibiotics to treatment group with antibiotics. Patients with obesity (BMI $\geq 30$) (p=0.009), previous abdominal surgery (p=0.001), laparotomy (p<0.0001), endometrial cavity entry (p<0.0001), >1 fibroid (p=0.0004) or aggregate fibroid weight $>500g$ (p<0.0001) were more likely to receive antibiotics. Logistic regression was used to evaluate the rate of SSI among the control and treatment groups. Among abdominal cases, the control group with no antibiotics had an increased rate of SSI with an odds ratio of 4.89 (CI 1.80-13.27, p=0.0006). Among laparoscopic cases, antibiotic use did not affect the odds of developing SSI (OR 1.08, CI 0.35-3.35). Surgical findings (including endometrial cavity entrance, fibroid weight, fibroid number and EBL) did not increase odds of SSI. Hispanic race (OR 2.95) and obesity (OR 2.21) may increase the rate of SSI, with p-value 0.07 and 0.08, respectively.

Conclusion: ACOG guidelines do not recommend use of prophylactic antibiotics for myomectomies. However, our study demonstrates that the majority of surgeons elect to use antibiotics prophylactically. Additionally, our study suggests that antibiotic use decreases SSI in abdominal myomectomy, but does not decrease SSI in laparoscopic myomectomy. These findings contribute to the limited data informing guidelines regarding antibiotic use in myomectomy surgery.

Open Communications 4: Fibroids
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Three Ways of Approach for Uterine Cervical Myoma during Laparoscopic Hysterectomy
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*Corresponding author.

Study Objective: To show surgical strategy during laparoscopic hysterectomy for cervical myomas.


Setting: Leiomyomas location in the uterine cervix can reduce the mobility of the uterus and also distort the anatomical position of neighboring structures, such as the uterine artery and ureter, possibly leading to massive bleeding or ureteral injury. Thus, the surgery for cervical myomas is difficult and challenging. In this presentation, I will show our surgical strategy during laparoscopic hysterectomy for cervical myomas.

Patients or Participants: N/A

Interventions: We categorize our approaches to cervical myoma into three methods based on the myoma size and the mobility of the uterus.

1. The first method is to perform standard Total laparoscopic hysterectomy (TLH) using our usual steps. However, the lateral mobilization of the ureter is occasionally necessary to dissect the area around the cervix and parametrium safely, consequently, separation of the anterior leaf of the vesicouterine ligament may be necessary.

2. The second method is to perform partial or total enucleation of the leiomyoma via laparoscopy. After reducing the volume of the uterus and obtaining uterine mobility by enucleation, hysterectomy is performed.

3. The third method is transvaginal myomectomy assisted laparoscopic hysterectomy. Due to poor Mobility of the uterus, large volume of the myoma and limited working space, we couldn’t perform enucleation of the myoma via laparoscopy. Therefore, we tried to performed transvaginal myomectomy. After that, we could resect the uterus via laparoscopy. However, this technique is possible only if there is adequate surgical space in the vagina, and the cul-de-sac can be reached easily.

Measurements and Main Results: Laparoscopic surgery was completed safely without requiring a conversion to laparotomy.

Conclusion: Using these three methods step by step customizing the surgery to best address each case, safe laparoscopic surgery is possible, and open surgery can be avoided.

Open Communications 4: Fibroids
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The Novel Application of Transvaginal Notes for Hysteroscopic Polypectomy and Cervicalmyomectomy
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*Corresponding author.

Study Objective: To demonstrate the advantages of using transvaginal natural orifice transluminal endoscopic surgery (vNOTES) for both hysteroscopic polypectomy and cervical myomectomy.

Design: Video presentation of the surgical procedure.

Setting: University hospital.

Patients or Participants: A sexually inactive patient with numerous comorbidities presented with irregular vaginal bleeding in the setting of worsening pelvic pain and bladder pressure for three year. Pelvic MRI showed multiple cervical fibroids and an endometrial polyp.

Interventions: After the patient was anesthetized, a narrow vagina with no visibility of the cervical os was detected. vNOTES hysteroscopic polypectomy and cervical myomectomy were determined to be more appropriate than conventional methods. A GelPOINT mini port was first placed in the vagina, which allowed for entrance into the uterine cavity. A Myosure hysteroscope and laparoscopic tenaculum were inserted through the port, and polyps in the uterine cavity were then removed. After polypectomy, a transverse incision was made on the anterior cervix through the same port for cervical myomectomy. The tenaculum was used to grab the fibroid and a harmonic scalpel was then applied for enucleation. V-loc was used to close the incision and reconstruct the cervical canal. After suturing, hysteroscopy was performed again to confirm normal anatomy. A Foley catheter was placed to prevent cervical stenosis.

Measurements and Main Results: Complete resection of cervical myoma and uterine polyp were performed, with postoperative relief of symptoms (i.e. bladder pressure). The surgery was 70 mins with <10 mL of blood loss. The patient was discharged on the same day. She reported a normal menstrual cycle and no postoperative complications at her four-week follow-up visit.

Conclusion: For patients with cervical polyps and/or myomas who cannot be operated by conventional methods, NOTES hysteroscopy and myomectomy may be an attractive option and lead to less surgical complications, reduced pain, and faster recovery.
Relugolix Combination Therapy Improves Hemoglobin Levels in Anemic Women with Uterine Fibroids: Results from the Liberty Phase 3 Program

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*Corresponding author.

Study Objective: To evaluate the effect of Relugolix combination therapy (Rel-CT) on hemoglobin in women with uterine fibroids (UF) and anemia.

Design: LIBERTY 1 and 2 are phase 3, multinational, randomized, double-blind, placebo-controlled studies.

Setting: 80 (L1) and 99 (L2) clinical research centers globally.

Patients or Participants: Premenopausal women (age 18–50 years) with ultrasound-confirmed UF and heavy menstrual bleeding (HMB; menstrual blood loss [MBL] volume of ≥80 mL/cycle confirmed by alkaline hematin method).

Interventions: Women were randomized 1:1:1 to once-daily Rel-CT (relugolix 40 mg, estradiol 1 mg, norethindrone acetate 0.5 mg; 24 weeks), Delayed Rel-CT (relugolix 40 mg alone [12 weeks] followed by Rel-CT [12 weeks]), or placebo (24 weeks).

Measurements and Main Results: Analysis of a subset of women with anemia (hemoglobin ≤10.5 g/dL) at baseline and a documented hemoglobin value at Week 24 are reported for Rel-CT and placebo groups using pooled data from LIBERTY 1 and 2. At baseline, 33% (n=83, Rel-CT group) and 32% (n=83, placebo group) of women were anemic. Anemic women, compared with the overall study population, were more likely to be Black/African American (65.2% vs 51.2%) and from North America (85.9% vs 75.5%); at baseline, they had a larger uterine volume (mean: 285.5 vs 228.8 mL), and a (85.9% vs 75.5%); at baseline, they had a larger uterine volume (mean: 285.5 vs 228.8 mL), and a (85.9% vs 75.5%); at baseline, they had a larger uterine volume (mean: 285.5 vs 228.8 mL), and a (85.9% vs 75.5%); at baseline, they had a larger uterine volume (mean: 285.5 vs 228.8 mL), and a

Conclusion: In women with UF, HMB, and anemia at baseline, Rel-CT significantly improved hemoglobin concentrations, demonstrating how reductions in MBL volume translate into clinically meaningful improvement in anemia.

Use of Transcervical Radiofrequency Ablation for Treatment of Uterine Fibroids

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*Corresponding author.

Study Objective: The purpose of this video is to demonstrate the use of transcervical radiofrequency ablation (RFA) of uterine fibroids utilizing the Sonata Procedure.

Design: Case presentation

Setting: Academic affiliated community hospital

Patients or Participants: 51yo G5P4, with a history of abnormal uterine bleeding and fibroids, who previously underwent abdominal myomectomy and presented for further management. After thorough counseling, patient opted for the Sonata procedure.

Interventions: The Sonata device was deployed to the targeted ablation zone and radiofrequency energy was applied to a goal temperature of 105 degrees Celsius. Complete ablation of a type II anterior fundal uterine fibroid was achieved without any complications.

Measurements and Main Results: Patient tolerated the procedure well. She was discharged approximately 2 hours after her procedure. She did not require any narcotic pain medications upon discharge.

Conclusion: Transcervical radiofrequency ablation is a safe and effective alternative treatment option for management of uterine fibroids. It should be considered in patients who wish to avoid major surgery or are poor surgical candidates.

Disparities in Minimally Invasive Myomectomy When Matched for Fibroid Burden

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*Corresponding author.

Study Objective: To identify whether disparities persist between route of myomectomy when matching African American and Caucasian women for fibroid burden, using preoperative, intraoperative, and postoperative findings.

Design: This is a retrospective chart review of all myomectomies at a tertiary care center between 2012 and 2018. Surgical approach to myomectomy was classified as open, laparoscopic, or robotic-assisted laparoscopic. Fibroid burden was quantified preoperatively using uterine volume, intraoperatively by number of fibroids on operative report, and postoperatively by fibroid weight from pathology report.

Setting: A single academic center where all patients have equal access to surgeons who perform minimally invasive and open myomectomy.

Patients or Participants: 689 women who underwent surgical treatment of fibroids were included.

Interventions: n/a

Measurements and Main Results: African-American women had higher fibroid burden by preoperative imaging (p<0.01) and operative report (p<0.01), but not fibroid weight on pathology report (p=0.09). Using standard logistic regression, patients who had a higher number of fibroids on operative report were more likely to undergo open myomectomy when controlling for race (p<0.01).

We then used the greedy nearest neighbor matching without replacement, within caliper width of 0.5, to match Caucasian women and African-American women by fibroid burden. Using propensity score matching for preoperative uterine volume (p=0.38), number of fibroids on operative report (p=0.84), and fibroid weight on pathology report (p=0.26), there was no statistically significant difference between African American and Caucasian women undergoing minimally invasive or open myomectomy.

Conclusion: In a single institution where all women have access to minimally invasive and open myomectomy, race did not affect whether women underwent an open or minimally invasive procedure when matched for fibroid burden. This finding suggests that access to minimally invasive myomectomy for women with a similar fibroid burden plays a role in the national disparity between African American and Caucasian women undergoing surgical treatment of fibroids.
Open Communications 4: Fibroids
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Upper Vaginectomy for Fibroid Recurrence at the Vaginal Cuff in a Patient with ER/PR Positive, HER2/Neu Negative Breast Cancer

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*Corresponding author.

Study Objective: To present an unusual case of fibroid recurrence at the vaginal cuff, and a unique approach to safely perform an upper vaginectomy

Design: The following video shows the operative technique utilized for the below presentation. Follow up included was the patient’s two week post operative appointment.

Setting: In the operating room with the patient in dorsal lithotomy position, utilizing deep trendelenberg and a robotic platform

Patients or Participants: Our patient is a 42 year old female with newly diagnosed ER/PR positive, Her2/neu negative invasive ductal carcinoma. She underwent pre operative imaging which showed a mass at her vaginal cuff. She had a history of uterine fibroids for which she underwent a laparoscopic assisted vaginal hysterectomy years prior.

Interventions: The patient was taken to the operating room for a robotic assisted upper vaginectomy and upper vaginectomy with removal of vaginal cuff mass.

Measurements and Main Results: Pathology revealed leiomyoma without evidence of malignancy

Conclusion: Robotic assisted upper vaginectomy is a safe approach for a removal of a mass at the vaginal cuff and allows the surgeon to easily perform ureterolysis to the level of the insertion of the ureters at the bladder.

Open Communications 4: Fibroids
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Surgical Treatment of Multiple Parasitic Leiomyomas 14 Years after Laparoscopic Myomectomy Utilizing Power Morcellation

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Study Objective: To describe a unique case-presentation and demonstrate the surgical technique used for complete excision of multiple parasitic leiomyomas 14 years after history of power morcellation.

Design: Video of case-presentation

Setting: Academic hospital

Patients or Participants: Single surgical patient

Interventions: Surgical technique used for removal of multiple parasitic leiomyomas

Measurements and Main Results: A 43-year-old woman presented with a symptomatic enlarged fibroid uterus, abnormal uterine bleeding, and pelvic pain 14 years after laparoscopic myomectomy using power morcellation. Diagnostic imaging revealed pelvic masses most consistent with multiple uterine fibroids with predominant large posterior pedunculated fibroid. She was scheduled for total laparoscopic hysterectomy and bilateral salpingectomy. Intraoperatively, she was found to have multiple parasitic leiomyomas throughout the abdomen and pelvis which included the abdominal wall, small bowel mesentery, and colon. Complete laparoscopic excision of all leiomyomas was performed without complication. Histopathology confirmed diagnosis of benign leiomyomatosis uteri.

Conclusion: Parasitic leiomyomas are a rare, late sequelae of laparoscopic myomectomy with power morcellation. Initial diagnostic imaging may be misleading; therefore, surgical excision is warranted for diagnosis and treatment. Laparoscopic excision of multiple parasitic myomas can be performed safely and is considered definitive treatment.

Open Communications 5: Hysteroscopy
(3:00 PM — 4:00 PM)

3:00 PM

Dego: A Novel Variable to Predict the Live-Birth Rate in Patients with Intrauterine Adhesions Following Hysteroscopic Adhesiolysis

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*Corresponding author.

Study Objective: To propose the density of endometrial glandular openings (DEGO) as a simple and reliable new variable in predicting live birth after hysteroscopic adhesiolysis (HA).

Design: Retrospective cohort study.

Setting: University hospital.

Patients or Participants: 469 patients with intra-uterine adhesions who underwent hysteroscopic adhesiolysis followed by second look hysteroscopy with images recorded. 12 were lost to follow-up or excluded by criteria. The remaining 457 were included in the study and followed up over a period of 2 years. 231 patients had live-births, 82 patients had recurrent spontaneous abortion without live-birth and 144 patients remained infertile at the end of the study.

Interventions: None

Measurements and Main Results: N/A.

Main Outcome Measure(s): The second look hysteroscopic images were evaluated by an automatic counting system to calculate the density of endometrial glandular openings (DEGO). The American Fertility Society (AFS) scores were also calculated for each patient. Logistic regression analysis was performed to develop a prediction model for each of these scores to predict live-birth-rate following hysteroscopic adhesiolysis. The performance of each of these prediction models was compared by calculating the area under the curve (AUC).

Result(s): The logistic regression analysis revealed that both DEGO and AFS scores were closely correlated with live-birth rates in patients with intra-uterine adhesions (p<0.0001). The AUCs for AFS scores pre-operatively and post-operatively (evaluated during the final second-look hysteroscopy) were 0.7611 and 0.7691 respectively; The AUC for DEGO post-operatively (evaluated during the final second-look hysteroscopy) was 0.8628. When compared with pre- or post-operative AFS score, the post-operative DEGO had an optimal prediction performance (p=0.0002, p<0.0001, respectively).

Conclusion: Post-operative DEGO has superior performance to AFS score in predicting the live-birth rate following hysteroscopic adhesiolysis for patients with intrauterine adhesions.

Open Communications 5: Hysteroscopy
(3:00 PM — 4:00 PM)

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Safety and Tolerability of Office Hysteroscopic Adhesiolysis for Asherman’s Syndrome

Williams A., 1, 2 Movilla P.R., 1 Chen T.Y., 1 Reddy H., 3 Morales B., 3 Wang J., 1 Wang J.R., 1 Tavcar J., 1 Morris S.N., 1 Loring M., 1 Issacson K.B. 1. 1 Center for Minimally Invasive Gynecologic Surgery, Newton-Wellesley Hospital, Newton, MA; 2 Center for Minimally Invasive
Hysteroscopic Adhesiolysis Using Holmium YAG Laser in Patients with Asherman’s Syndrome – Easy, Effective & Safe
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Study Objective: To evaluate the efficacy and safety of hysteroscopic adhesiolysis with Holmium YAG (Ho:YAG) Laser in patients with stage 2 and 3 Asherman’s syndrome (ASRM classification).

Design: Prospective study of patients operated from April 2016 to August 2019.

Setting: Tertiary centre dedicated to Obstetrics, Gynaecology and Urology.

Patients or Participants: 23 women of Asherman’s syndrome diagnosed on the basis of clinical presentation, transvaginal ultrasound and hysteroscopy.

Interventions: Hysteroscopic adhesiolysis was done using Holmium YAG laser delivered through a 400 micron quartz fibre at a power setting of 15 Watts. Normal saline at a pressure of 100 mm of Hg was used as the distending medium. Simultaneous laparoscopy was done in 14 patients. Post-operative intracavitary Foley catheter and sequential oestrogen & progesterone therapy was given for prevention of adhesion recurrence. Relook hysteroscopy was done in all patients after 2 months.

Measurements and Main Results: Mean operative time was 25 minutes (18 – 45 minutes). Stage 2 adhesions were seen in 15 patients & stage 3 in 8 patients. There were no intra or post-operative complications. 22 patients regained normal menstrual pattern (average flow). There were flimsy adhesions in 3 patients and dense adhesions in 1 patient on relook hysteroscopy. Adhesiolysis was done again with Ho:YAG laser. Mid cycle transvaginal ultrasound showed significant improvement in endometrial thickness (average of 7.4 mm).

Follow up of the 18 patients for 12 months showed clinical pregnancies in 12 patients (66.7%) & 9 live births (50.0%) without any intra or postpartum complications.

Conclusion: Hysteroscopic adhesiolysis with Holmium YAG laser in stage 2 and stage 3 Asherman’s syndrome is an effective, safe and easy procedure which helps to improve the menstrual function and the reproductive outcome in these patients.

Open Communications 5: Hysteroscopy
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Resection of a Complete Uterine and Cervical Septum
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*Corresponding author.

Study Objective: This video demonstrates a technique for the surgical correction of a complete uterine and cervical septum.

Design: 1. Overview of the background, clinical presentation and relevant pre-operative planning. 2. An illustration and instruction for surgical correction. 3. Discussion of the post-operative care and long-term outcomes.

Setting: The patient is positioned in lithotomy with their legs in yellow fin stirrups to allow for concurrent laparoscopic and hysteroscopic surgery.

Patients or Participants: The procedure is demonstrated using a patient’s single surgery.

Interventions: A technique for resecting a complete uterine and cervical septum using vaginal and hysteroscopic surgery under laparoscopic guidance. The septum is delineated using a Foley catheter balloon in the contralateral uterine cavity, allowing for the incision and resection of the septum. The septum is resected from the level internal cervical os to the fundus to avoid future mechanical cervical insufficiency.

Measurements and Main Results: N/A

Conclusion: This video clearly demonstrates a technique for the hysteroscopic correction of a complete uterine and cervical septum under laparoscopic guidance. The septum is delineated by using a Foley catheter balloon in the contralateral uterine cavity to create a bulge at the level of the fibrous septum.

Open Communications 5: Hysteroscopy
(3:00 PM — 4:00 PM)

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Hysteroscopic Approaches to the Removal of Malpositioned Intrauterine Devices (IUDs)
*Corresponding author.
Study Objective: The objectives of this video are to (1) demonstrate both common and uncommon clinical presentations of a malpositioned intrauterine device (IUD) and (2) demonstrate appropriate removal techniques, including those ideal for both the office and operating room setting.

Design: Surgical technique demonstration

Setting: All procedures were conducted at an academic medical center. Procedures were performed in the office setting and operating room where appropriate. The office setting includes both routine exam rooms and procedure suites. Operating room based procedures are performed in an outpatient surgery center. The patients are positioned in lithotomy using built-in table stirrups in the office and either candy cane or boot stirrups in the operating room.

Patients or Participants: Photo and video footage was collected from patients managed within the gynecology division at our institution. All patients agreed to the use of photos and videos for educational purposes via an informed consent process.

Interventions: Using a combination of surgical footage, 3-dimensional animation and imaging (ultrasound, MRI), the video progresses through several different scenarios of malpositioned and embedded IUDs and corresponding techniques for removal. These techniques include caudal traction, sharp dissection, electrosurgical dissection, cranial-caudal motion, and rotation.

Measurements and Main Results: n/a

Conclusion: This video reviews the clinical approach to the removal of malposition.

Open Communications 6: Robotics

(4:00 PM — 5:00 PM)

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Retrograde Bladder Dissection for Prevention of Bladder Injury during Robotic-Assisted Laparoscopic Hysterectomy

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*Corresponding author.

Study Objective: To demonstrate a technique for retrograde bladder dissection in a patient with extensive adhesive disease of the pelvis.


Setting: Academic tertiary referral center.

Patients or Participants: 38-year-old gravida 3, para 2 with history of two prior Cesareans and tubal ligation, presented with long-standing abnormal uterine bleeding, dysmenorrhea as well as chronic pelvic pain. She was referred to minimally invasive gynecology for definitive surgical management. Preoperative pelvic ultrasound revealed uterus measuring 10.1 × 4.9 cm and was otherwise unremarkable.

Interventions: Patient was taken to the operating room for robotic-assisted hysterectomy and bilateral salpingectomy. After general anesthesia was administered, patient was placed in dorsal lithotomy position. Intraoperatorically, the anterior cul-de-sac was obliterated due to her prior surgeries. The bladder was densely adherent to the entire length of the uterine arteries bilaterally, starting at their origin. The retroperitoneum was entered medially, then paravesical and pararectal avascular spaces were dissected bilaterally. The uterine artery was ligated at the origin to decrease pulse pressure of uterine circulation. Ureterolysis was performed bilaterally. The bladder was carefully dissected and mobilized caudally, in a lateral-to-medial and inferior-to-superior fashion to avoid injury, following the anatomical landmarks. After the bladder was mobilized, hysterectomy was safely completed without complications.

Measurements and Main Results: The patient had an uneventful postoperative course and was discharged home on the day of surgery. Pathology was benign and revealed adenomyosis as well as endometriosis in right fallopian tube. The patient was symptom-free at her 4-week postoperative visit.

Conclusion: Retrograde bladder dissection is a useful technique to safely restore anatomy in patients with dense adhesive disease and obliterated anterior cul-de-sac. Knowledge of anatomical landmarks is essential for this technique.

Open Communications 6: Robotics

(4:00 PM — 5:00 PM)

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Multi-Disciplinary Approach to Colorectal Endometriosis

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*Corresponding author.

Study Objective: To demonstrate a novel multi-disciplinary decision tree for workup of colorectal endometriosis and subsequent collaborative surgery.

Design: Case Report.

Setting: Community teaching hospital. Collaborative robotic surgical team including a minimally invasive gynecologic surgeon and colorectal surgeon utilizing the Da Vinci Xi platform.

Patients or Participants: 41-year-old Gravida 0 with morbid obesity, history of stage IV endometriosis presenting with worsening dysmenorrhea, heavy menstrual bleeding, pelvic pain and cyclic rectal bleeding.

Interventions: Utilization of a novel multi-disciplinary decision tree for workup and subsequent surgical management of colorectal endometriosis. Surgery performed was a robotic-assisted low anterior bowel resection with primary colorectal anastomosis and a total laparoscopic hysterectomy, right salpingectomy, lysis of adhesions and excision of endometriosis.

Measurements and Main Results: Complete excision of endometriosis and adenomyosis, including colorectal disease. Improvement of patient’s pelvic pain and resolution of her dysmenorrhea, heavy menstrual bleeding and rectal bleeding.

Conclusion: Utilization of our novel multi-disciplinary decision tree can standardize and optimize care for cases of complex colorectal endometriosis.

Open Communications 6: Robotics

(4:00 PM — 5:00 PM)

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Urinary Tract Infections after Minimally Invasive Hysterectomy

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*Corresponding author.

Study Objective: To determine rates and risk factors for urinary tract infection (UTI) following minimally-invasive hysterectomy (MIH).
Design: Retrospective cohort study.
Setting: Academic health system.
Patients or Participants: Women undergoing MIH between March 2017 and December 2019.
Interventions: Vaginal hysterectomy (VH), laparoscopic hysterectomy (LH), robotic hysterectomy (RH)
Measurements and Main Results: Of 1,526 women included in the study, 13% underwent VH, 30% LH, and 57% RH. Concomitant procedures included gynecologic oncological (20%) and pelvic reconstruction (16%). Post-operative UTS, defined as UTS symptoms treated within 30 days, developed in 9.6% of women. Women with pelvic reconstructive procedures had a UTS rate of 23.3% vs 7.03% without (p<0.001).
Women who developed UTSs were older (56.3±12.9 vs 53.6±12.7, p=0.0153), more likely to have chronic UTS (14% vs 3%, p<0.001) and neurologic disease (35% vs 25%, p=0.016). Hysterectomies complicated by post-operative UTIs were more likely to be VH (28% vs 11%, p<0.001), longer (265±93min vs 245±75min, p=0.0035), include adhesiolysis (10% vs 6%, p=0.028), cystoscopy (52% vs 31%, p<0.001), and bladder injury (2% vs 0.5%, p=0.048). Women who developed UTS were less likely to undergo passive voiding trial (25% vs 40%, p<0.001) and more likely to have ileus (2% vs 0.1%, p=0.003), be discharged with a Foley (30% vs 8% p<0.001), receive narcotics within 8-hours of catheter removal (64% vs 50%, p=0.004), and have urinary retention (14% vs 2%, p<0.001).
After logistic regression and excluding pelvic reconstructive cases, variables remaining independently associated with increased post-operative UTS risk included: chronic UTS (aOR 5.18; 95% CI, 2.14-12.57), neurologic disease (aOR 1.75; 95% CI, 1.05-2.92), VH (aOR 2.69; 95% CI, 1.31-5.53), adhesiolysis (aOR 3.18; 95% CI, 1.45-7.01), narcotics within 8-hours of catheter removal (64% vs 50%, p=0.004), and have urinary retention (14% vs 2%, p<0.001).

Conclusion: Risk factors for UTS after MIH include pelvic reconstructive procedures and VH.

Open Communications 6: Robotics
(4:00 PM — 5:00 PM)

4:18 PM
Suturing Techniques during Robotic-Assisted Myomectomy
Swisher T.M., 1,2 Le A. 1 Tan L.M., 1 Cho M. 1 Obstetrics and Gynecology, Kaiser Permanente Northern California, San Francisco Medical Center, San Francisco, CA; 2Obstetrics and Gynecology, Kaiser Permanente Northern California, San Rafael Medical Center, San Rafael, CA
*Corresponding author.

Study Objective: To help novice surgeons master robotic suturing techniques using side-by-side views of the surgical instruments and field as well as the surgeon’s hands at the console during robotic-assisted myomectomy.
Design: Compilation of recorded video segments showing the suturing of various myometrial defects with simultaneous views of the surgeon’s hands during robotic-assisted myomectomy.
Setting: A tertiary care hospital.
Patients or Participants: A total of four patients were selected to demonstrate different suture techniques after removal of leiomyoma of different sizes and locations within the uterus.
Interventions: Deep myometrial defects are standardly closed in three layers starting with a deep running stitch, followed by an imbricating layer, and lastly with a baseball stitch closure of the uterine serosa utilizing a unidirectional barbed suture. We demonstrate different tips and tricks for proper ergonomic placement of the hands at the console, needle handling and camera angling that can be employed, depending on the location and orientation of the hysterotomy site. The intra-abdominal surgical views are shown alongside the view of the surgeon’s hands at the console.
Measurements and Main Results: N/A
Conclusion: By offering a side-by-side view of the surgical instruments and the hand orientation of the surgeon at the console, it provides an additional perspective for a surgical learner that is otherwise not achievable in the intraoperative setting for robotic surgeries. We hope that this video can serve as a helpful resource to surgeons, instructors, and trainees for suturing techniques during robotic-assisted myomectomies.

Open Communications 6: Robotics
(4:00 PM — 5:00 PM)

4:24 PM
Hepatic Endometriosis
Mohling S.*, Pearl Women’s Center, Portland, OR
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Study Objective: Robotic assisted laparoscopic surgery may be used to excise endometriosis of the anterior hepatic lobe and overlying abdominal wall endometriosis.
Design: Patient history and magnetic resonance imaging were used to diagnose hepatic and overlying abdominal wall endometriosis. Robotic assisted laparoscopic surgical technique was used to surgically excise the disease from the liver and abdominal wall.
Setting: Community hospital setting.
Patients or Participants: 45-year-old G2P2 with worsening dysmenorrhea, 3 years of debilitating right upper quadrant abdominal pain, normal hepatic enzymes and normal ultrasound of liver and gall bladder.
Interventions: Collaboration between a gynecologist and a general surgeon trained in minimally invasive surgical technique allowed for safe excision of hepatic and abdominal wall endometriosis. A 30-degree laparoscope was used. While it is not shown in this short film, total laparoscopic hysterectomy and excision of deeply infiltrating pelvic endometriosis were also done during the same procedure and using the same ports.
Measurements and Main Results: Relief of pain 3 months following procedure at the time of this video.
Conclusion: Robotic assisted laparoscopy for surgical excision of hepatic and upper abdominal wall endometriosis is a straightforward and effective way to treat extra-pelvic disease.

Open Communications 6: Robotics
(4:00 PM — 5:00 PM)

4:30 PM
Lipoma or Liposarcoma? Robotic Resection of a Retroperitoneal Mass
Kashi P. Katebi, 1,2 Dengler K.L., 2 Hamilton C.A. 1, 3 Division of Gynecology Oncology, Department of Ob/Gyn, Inova Fairfax Women’s Hospital, Falls Church, VA; 2Division of Urogynecology, Department of Ob/Gyn, Walter Reed National Military Medical Center, Bethesda, MD; 3Division of Gynecology Oncology, Department Ob/Gyn, Inova Fairfax Women’s Hospital, Falls Church, VA
*Corresponding author.

Study Objective: Demonstrate robotic-assisted resection of a large retroperitoneal lipomatous mass.
Design: Surgical video
**Setting:** Tertiary-care operating room using DaVinci Xi system with four 8 mm trocars, and a 12 mm assistant port.

**Patients or Participants:** A 48-year-old female with a multi-fibroid uterus and seven centimeter lipomatous mass in her right hemipelvis.

**Interventions:** The patient underwent robotic-assisted excision of the right retroperitoneal mass, total hysterectomy, right salpingo-oophorectomy, left salpingectomy, and cystoscopy.

**Measurements and Main Results:** Although superficial lipomas are common and most likely benign, retroperitoneal lipomatous tumors are rare. Tumors greater than ten centimeters have a higher malignant potential and are typically found in the deep retroperitoneal space. Robotic-assisted laparoscopy revealed a large lipomatous mass in the right retroperitoneal space consistent with radiographic imaging. The surgeon divided the round ligament and extended the incision parallel to the infundibulopelvic ligament to enter the right retroperitoneum. He then carefully dissected and resected the lipomatous tumor from the pararectal space and performed the remainder of the procedures without complication. Benign lipomas and low grade liposarcoma are difficult to differentiate. The latter has a high rate of local recurrence if incompletely resected, therefore complete resection should be the surgical goal. Pathology revealed partially encapsulated mature adipose tissue consistent with lipoma with negative fluorescent in situ hybridization (FISH) analysis using a dual color MDM2/CEN12 probe set confirming the likely benign behavior of the mass.

**Conclusion:** Retroperitoneal lipomatous tumors are rare. Distinguishing between lipomas and liposarcomas is a diagnostic challenge both radiographically and intraoperatively. Confirmatory histopathology, and often molecular pathology, is necessary for the final diagnosis. Knowledge of the pathology of retroperitoneal lipomatous masses and the related surgical anatomy and goals are imperative to optimal management.

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**Open Communications 6: Robotics**

**(4:00 PM — 5:00 PM)**

**Resection of Bladder Mass**

Kharrafeh A.J.¹, ²* Elkkath A.R.²⁻¹. Obstetrics and Gynecology, University of Illinois College of Medicine - Peoria, Peoria, IL; ²Obstetrics and Gynecology, University of Illinois College of Medicine Peoria, Peoria, IL

*Corresponding author.

**Study Objective:** To illustrate surgical techniques and anatomic considerations involved in the resection of urinary bladder wall mullerianiosis.

**Design:** Video footage captured during an operative case has been adapted to highlight the surgical principles essential to safe and complete resection of this rare and morphologically complex lesion.

**Setting:** After induction of general anesthesia and endotracheal intubation, the patient was placed in dorsal lithotomy position. Robotic camera and access ports were introduced into the abdomen. A sponge stick was placed into the vagina to serve as a manipulator. The patient was placed in Trendelenburg position.

**Patients or Participants:** A 46-year-old premenopausal female with long-standing history of cyclic pelvic pain.

**Interventions:** Robotic assisted resection of the patient’s bladder wall lesion.

**Measurements and Main Results:** The procedure was successful in achieving its diagnostic and therapeutic goals. The lesion was completely resected without unplanned complications and the patient achieved improvement in her symptoms. Final surgical pathology revealed mullerianiosis.

**Conclusion:** The surgical techniques highlighted in this video can aid in the safe and complete resection of bladder wall lesions.

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**Open Communications 6: Robotics**

**(4:00 PM — 5:00 PM)**

**Robotic Port Closure: An Efficient, Safe, Novel Technique for Fascial Suturing**

Shu M.K.M.¹⁺⁻¹ Eddib A. ², ¹University at Buffalo, Williamsville, NY; ²Department of Surgery, University of Tripoli, Tripoli, Libya; ³Minimally Invasive Advanced Pelvic Floor Surgery Fellowship, Millard Fillmore Suburban Hospital, Williamsville, NY

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**Study Objective:** Minilaparotomy can be closed effectively with an intra-abdominal, robotic-assisted technique.

**Design:** N/A

**Setting:** With adoption of more laparoscopic and robotic techniques for surgical procedures, there has been a rise in the use of minilaparotomy incisions for tissue extraction. Fascial closure can be accomplished by a variety of approaches. The traditional and most common approach is approximating the fascial edges under direct vision, however, in the obese patient these incisions may be quite challenging to close in this fashion. There have been multiple instruments described for port site fascial closure (<15mm), however none thus far that can close an incision larger than 1.5 centimeters.

**Patients or Participants:** This is a 60-year-old female who presented for surgical management of stage IV pelvic organ prolapse. The patient underwent a robotic-assisted supracervical hysterectomy, bilateral salpingo-oophorectomy, and sacrocolpopexy.

**Interventions:** After extraction of the specimen, the extraction site is sealed to maintain pneumoperitoneum using any of a variety of options such as clamps, staples, tapes, or sutures. Once the pneumoperitoneum is maintained, the fascial edges are identified and freed from the overlying peritoneum. The fascial edges are then approximated with a running delayed absorbable barbed suture and then the peritoneum is closed with 2-0 delayed absorbable barbed suture to cover the fascial closure and reduce adhesions to the site.

**Measurements and Main Results:** This technique provides excellent exposure and visibility of the fascial edges regardless of a patient’s body habitus. We believe this is a safe and feasible technique that provides an easy, quick alternative to the traditional direct fascial closure technique.

**Conclusion:** Robotic-assisted intra-abdominal fascial closure is efficient and safe. With proper closure of the abdominal wall fascia at these small and difficult incision sites, including minilaparotomy, we may be able to reduce the risks of immediate and delayed incisional hernia.

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**Open Communications 6: Robotics**

**(4:00 PM — 5:00 PM)**

**Impact of Robotic Single and Dual Console Systems in the Training of Minimally Invasive Gynecology Surgery (MIGS) Fellows**

Leon M.G.¹⁺⁻¹ Carrubba A.R.¹, ¹Robertson M.W. III,¹ Lesser E.R.², DeStephano C.C.¹, ¹Dinh T.A.A.¹⁻². Gyneocologic Surgery, Mayo Clinic Florida, Jacksonville, FL; ²Biomedical Statistics and Informatics, Mayo Clinic Florida, Jacksonville, FL

*Corresponding author.

**Study Objective:** To evaluate fellow console time, surgical steps performed, and surgical takeovers between attending and fellow using a dual versus (vs) single console robotic systems.

**Design:** Quality improvement project evaluating use of dual consoles in robotic surgical education.
Setting: MIGS fellowship program in an academic institution’s tertiary care center.
Patients or Participants: Two MIGS fellows and 5 subspecialty trained gynecologic surgeons.
Interventions: Variables were prospectively collected for 62 robotic surgeries and included: dual vs single console, trainee console time, trainee, attending, surgical takeovers, docking time, type of surgery, steps performed by trainee, complications, total case time, specimen weight and estimated blood loss. Demographic patient data were also collected. Variables were compared using the Wilcoxon Rank Sum test (continuous), and the Pearson Chi-square test (categorical).
Measurements and Main Results: Fellows spent more time at the console in dual console operations compared to single (56 vs. 36 min, P=0.002). There were 11 (31%) single console procedures where the fellow had no control compared to dual console where the fellow assumed control every time (P=0.001). Median number of surgical takeovers was higher in dual console operations (3 vs. 1, P<0.001). Complications under dual and single consoles were similar, and no differences were observed in the number of surgical steps performed by the fellow. The median case time was longer when a dual console was used (169 vs. 139 min, P=0.010), and the BMI of patients in this group was lower (27 vs. 34, P=0.030). Fellow console time remained significantly longer with dual console use after multivariable logistic regression independently controlled for BMI, surgical attending, and type of surgery.
Conclusion: Dual console robotic training provide fellows the opportunity for more hands on experience and more interaction between the fellow and surgical attending, with an increased number of surgical takeovers. This opportunity presents itself at the cost of a longer case time but with similar complication rates. Knowledge of the alignment of the IUD to the longitudinal axis of the uterus and the degree of embedment, or perforation, allows for employing the most appropriate technique. Although removal can often be achieved in the office, deeply embedded IUDs or IUD fragments may require the operating room setting for safe extraction.

Open Communications 5: Hysteroscopy
(3:00 PM — 4:00 PM)

3:30 PM

Cesarean Section Scar Ectopic: Laparoscopic and Hysteroscopic Surgical Management
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Study Objective: To present a case of resection of cesarean section scar ectopic pregnancy with isthmocele repair using both laparoscopic and hysteroscopic techniques.
Design: N/A
Setting: Patient was positioned in the standard dorsal lithotomy position. Throughout the entirety of the video the patient is in Trendelenburg position.
Patients or Participants: A 25 yo G7P3124 who was diagnosed with a c-section scar ectopic pregnancy via 5w4d ultrasound after presenting with vaginal bleeding and abdominal pain. After being counseled on options for medical versus surgical management, she was initially treated with a dose of methotrexate. Upon further discussion the patient was transferred and opted for surgical management.
Interventions: In anticipation of potential significant blood loss, a laparoscopic tourniquet was placed at the lower uterine segment and the uterine arteries were skeletonized for easy ligation. A bladder flap was made at the level the vesicouterine peritoneum. The ectopic products of conception were removed hysteroscopically. The isthmocele was then resected and repaired laparoscopically. Finally, hysteroscopic inspection was used to confirm normal contour of the uterus and isthmocele repair.
Measurements and Main Results: Our patient underwent uncomplicated laparoscopic and hysteroscopic resection of cesarean section scar ectopic with isthmocele repair with minimal blood loss. She was discharged from PACU and was doing well at one week follow up.
Conclusion: There is currently no standard of care for management of cesarean section scar ectopic. When opting for surgical management it is important to anticipate possible complications, including dense adhesions and hemorrhage. In this video we provide a detailed combined hysteroscopic and laparoscopic approach to removal of cesarean scar ectopic. Techniques to minimize blood loss and reduce injury to surrounding organs are highlighted; including bladder distension, laparoscopic tourniquet, and uterine artery skeletonization. Anticipating and mitigating potential complications with these techniques leads to an optimal outcome.
Monday, November 9, 2020

Open Communications 7: Urogynecology
(3:00 PM — 4:00 PM)

3:00 PM

Repair of Vesicovaginal Fistula at Time of Colpocleisis

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2Female Pelvic Medicine & Reconstructive Surgery, University of South Florida, Tampa, FL;  
3Reconstructive Urology, University of South Florida, Tampa, FL  
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Study Objective: The objective of this video is to present the surgical management of a large vesicovaginal fistula with ureters presenting through the fistula with concomitant colpocleisis.

Design: Surgical Video.

Setting: The patient was placed in the dorsal lithotomy position for the entirety of the surgery.

Patients or Participants: We present the case of an 83 year-old female with a history of stage IV prolapse who underwent initial treatment with placement of a pessary. After a year following pessary placement, the patient had the device removed and urine was noted to be in the vaginal vault, highly suspicious for a vesicovaginal fistula. Subsequently, the patient had a cystourethrogram confirming a 0.7 x 1 cm vesicovaginal fistula. For further evaluation and surgical planning, the patient underwent an exam under anesthesia and cystourethroscopy. On vaginal exam, the patient was noted to have stage IV prolapse with a large 5 cm vesicovaginal fistula with the ureters clearly visible, approximately 3 cm from the opening of the fistula. Following evaluation, the patient decided to proceed with definitive surgical management.

Interventions: Vesicovaginal fistula repair at time of colpocleisis.

Measurements and Main Results: The patient underwent a vesicovaginal fistula repair with concomitant colpocleisis. The case was performed by Urology and Urogynecology in order to preserve ureteral integrity. At the patient’s one month follow up, she had no complaints of prolapse or vaginal leaking. She additionally underwent a cystoureterogram demonstrating no leakage at the site of repair.

Conclusion: Neglect of a vaginal pessary can lead to serious complications indicating the importance of patient education and careful follow-up. Surgical planning is a key component in effectively managing a vesicovaginal fistula with ureteral presentation in order to preserve ureteral integrity. Concomitant vesicovaginal repair and colpocleisis can be performed safely with effective cure of a vesicovaginal fistula and stage IV prolapse.

Open Communications 7: Urogynecology
(3:00 PM — 4:00 PM)

3:06 PM

Duplicated Collecting System

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*Corresponding author.

Study Objective: The objective of this video is to discuss the presentation, evaluation, and treatment of duplicated urinary collecting systems, and to present a case of duplicated ureters with ectopic ureteral implantation at the vaginal introitus.

Design: N/A

Setting: N/A

Patients or Participants: We present the case of a 56 year-old presenting with a history of recurrent urinary tract infections starting in adolescence.

She reported symptoms of urinary urgency, frequency, and incontinence. She additionally reported an unclear history of an incidental diagnosis of ureteral anomaly in childhood.

Interventions: For evaluation of this patient, a computed tomography urogram was performed which revealed a right duplicated kidney with upper ureter inserting into the bladder neck, and lower ureter with unclear course. A voiding cystogram was performed to evaluate for ureteral reflux which was not demonstrated. A renal MAG3 scan was performed and demonstrated differential function between the two right renal moieties but no evidence of obstruction to the outflow tract to either renal moiety. Exam under anesthesia, cystoscopy, and right retrograde pyelogram revealed an ectopic ureteral orifice at the vaginal introitus and mild hydroureter leading to the upper renal moiety.

Measurements and Main Results: Complete mapping of this patient’s right collecting system revealed complete ureteral duplication with the lower renal moiety drained by a normal ureter leading to an orthotopic ureteral orifice and the upper renal moiety draining into a mildly dilated ureter leading to an ectopic ureteral orifice at the vaginal introitus. The patient will subsequently undergo robotic-assisted right ureteroureterostomy and excision of distal ectopic ureter in a combined laparoscopic and vaginal approach.

Conclusion: Duplicated urinary collecting systems are the most common birth defect related to the urinary tract and can be frequently encountered by the pelvic surgeon. Knowledge of the presentation and workup of these anomalies is important in determining appropriate treatment.

Open Communications 7: Urogynecology
(3:00 PM — 4:00 PM)

3:12 PM

Urinary Incontinence in Patients with Mayer-Rokitansky-Küster-Hauser Syndrome Is Independent of Treatment Strategy

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*Corresponding author.

Study Objective: Evaluate the level of distress secondary to urinary incontinence in patients with Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome and assess if it differs based on treatment strategy.

Design: Cross-sectional.

Setting: Online support communities for patients with MRKH.

Patients or Participants: Patients with MRKH aged ≥18 years who consented to participate.

Interventions: The participants answered an online-based survey in which demographic and clinical information was collected. Additionally, a section with adapted versions of the Urinary Distress Inventory-6 (UDI-6) and the Incontinence Impact Questionnaire-7 (IIQ-7) was incorporated to evaluate for urinary symptomatology and its impact on quality of life.

Measurements and Main Results: 65 patients with a median age of 32 years (range: 18-63) answered the survey. 27 (41.5%) had not undergone any procedure, 24 (36.9%) underwent vaginal dilation, 8 (12.3%) McIndoe vaginoplasty and 6 (9.2%) laparoscopic Vecchietti vaginoplasty. Overall, 53.8% reported symptoms of irritative incontinence, 63% of stress incontinence and 69.2% obstructive/discomfort symptoms. Furthermore, 32.3% of patients reported that urinary symptoms impacted their emotional health to some extent. Mean scores of the UDI-6 and IIQ-7 did not differ between treatment groups, even when non-invasive and invasive procedures were compared (p=0.96).

Conclusion: In this study, MRKH patients with four different treatment strategies did not have statistically significant differences in the severity of
urinary symptoms or their effect on quality of life.

<table>
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<tr>
<th>Procedure</th>
<th>UDI-6 (mean±SD)</th>
<th>p-value</th>
<th>IIQ-7 (mean±SD)</th>
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<tr>
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<td>Non-surgical dilation</td>
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**Open Communications 7: Urogynecology (3:00 PM — 4:00 PM)**

**3:18 PM**

Resection of a Longitudinal Vaginal Septum in a Patient with Uterus Didelphys

Davitt J.M., Wason M.N. 1, 2  
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*Corresponding author.

**Study Objective:** To demonstrate surgical excision of a longitudinal vaginal septum. To review the preoperative evaluation and postoperative care of patients undergoing resection of longitudinal vaginal septum.

**Design:** Description and demonstration of surgical technique.

**Setting:** While longitudinal vaginal septa are a relatively rare anatomic variant it is nevertheless important that gynecologic surgeons are well-versed in their evaluation and management.

**Patients or Participants:** Patient with known longitudinal vaginal septum and uterus didelphys.

**Interventions:** Resection of longitudinal vaginal septum.

**Measurements and Main Results:** Complete resection of septum and repair of vaginal epithelial defect.

**Conclusion:** Complete resection of a longitudinal vaginal septum is a relatively safe and straightforward procedure that is well within the scope of the generalist gynecologic surgeon. Resection of the septum provides substantial symptomatic relief for patients with this unique anatomic variant.

**Open Communications 7: Urogynecology (3:00 PM — 4:00 PM)**

**3:24 PM**

Transvaginal Natural Orifice Transluminal Endoscopic (vNOTES) Versus Conventional Vaginal Uterosacral Ligament Suspension

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*Corresponding author.

**Study Objective:** To study the pre- and post-operative outcomes of vNOTES versus vaginal uterosacral ligament suspension for apical compartment prolapse.

**Design:** Retrospective cohort study.

**Setting:** Academic affiliated community hospital.

**Patients or Participants:** Women with apical compartment prolapse who underwent vaginal uterosacral ligament suspension (USLS) procedure from January 2014 to February 2020.

**Interventions:** Uterosacral ligament suspension via vNOTES versus conventional vaginal approach.

**Measurements and Main Results:** Patients’ baseline characteristics, surgical characteristics, and surgical outcomes were retrieved from patients’ electronic file.

Of the 135 women underwent USLS, 65 women underwent conventional vaginal procedure while 70 women underwent vNOTES surgery. Higher incidence of intra-operative complications was observed in women that underwent vaginal USLS vs vNOTES USLS (14% vs. 6%, p<0.05). Higher incidence of intraoperative ureter obstruction and intra-abdominal bleeding was observed in the traditional vaginal approach group. Estimated blood loss was higher in the vaginal USLS vs the vNOTES USLS (143±87ml vs 58±68 ml, P<0.05). There were no statistically significant differences between vaginal and vNOTES USLS in terms of post-operative complications.

With regards to surgical outcomes, the vNOTES USLS group demonstrated a reduced operative time (125.5±27.6 vs. 101.4±22.3, p<0.05), anesthesia time (174.0±32.9 vs. 141.4±29.6, p<0.05), and slightly longer hospital stay (2.5±0.7 vs. 3.0±0.9, p<0.05). There was no statistically differences in 24 hours post-surgical pain assessment or in the demand of analgesics during hospital stay.

**Conclusion:** vNOTES USLS is associated with reduced incidence of intraoperative complications, shorter surgical and anesthesia time, and slightly longer hospital stays compared to the traditional vaginal surgical approach. There was no statistically significant difference in the rate of post-operative complications during hospital stay between the vNOTES and the traditional vaginal USLS.

**Open Communications 7: Urogynecology (3:00 PM — 4:00 PM)**

**3:30 PM**

Short Term Outcomes and Complications of a Single Incision Sling and Trans-Obturator Sling for the Treatment of Stress Urinary Incontinence

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*Corresponding author.

**Study Objective:** To compare the efficacy of the Altis single incision sling (SIS) to traditional trans-obturator (TOT) slings for the treatment of female stress urinary incontinence (SUI).

**Design:** Single center prospective non-randomized cohort study.

**Setting:** Academic Healthcare Facility.

**Patients or Participants:** 149 patients with SUI who were undergoing a mid-urethral sling placement with a SIS or a TOT sling between March 2018 and April 2019.

**Interventions:** Placement of Altis SIS or TOT sling.

**Measurements and Main Results:** Of the 149 patients who were treated for SUI, 73 had an Altis SIS placed and 76 had a TOT sling placed. Patients completed the Incontinence Questionnaire Short Form (ICIQ-SF) and the Patient Global Impression of Improvement (PGI) Form at 3, 6 and 12 months; which reflected subjective outcomes. Objective outcome was evaluated with a cough stress test at 3, 6 and 12 month intervals. At the 3 month mark there was a statistically significant difference in both subjective and objective outcomes in favor of the Altis SIS compared with the TOT sling, (p<0.05). However, no difference was noted at 6 and 12 months after sling placement (p>0.05). Subjectively there was a 88% success rate for the Altis sling and 83% for the TOT sling, with objective cure rates being 91.8% and 90.2% for the Altis SIS and TOT sling respectively. Intra-operative and postoperative complications including bleeding, transient urinary retention and pain showed no statistical significance between the 2 slings. Three sling erosion (4.1%) requiring revision were seen in the Altis SIS group compared with 1 (1.3%) in the TOT group, (p>0.05).

**Conclusion:** Findings from this study suggests that the objective and subjective outcomes as well as operative complications for the Altis SIS and the TOT sling are comparable, indicating that both slings are equally efficacious in treating patients with SUI after a short-term follow up.
Open Communications 7: Urogynecology
(3:00 PM — 4:00 PM)

3:36 PM

Preliminary Outcomes of an Innovative Approach to Transvaginal Graft Augmentation for Pelvic Organ Prolapse in the “Post-Mesh Era”

Study Objective: The objective of this study is to report the early outcomes of a novel transvaginal reconstructive repair of pelvic organ prolapse (POP) augmented with a “Y-shaped” biologic graft (Axis Dermis).

Design: Retrospective Cohort Study

Setting: Urogynecology academic private practice in central Pennsylvania

Patients or Participants: 36 women who underwent transvaginal pelvic reconstructive surgery with augmentation using Axis™ Dermis graft combined with SSL fixation using polypropylene suture for symptomatic Stage 2 prolapse or higher between April 2019 and October 2019

Interventions: All patients underwent transvaginal pelvic reconstructive surgery employing a “Y-shaped” Axis™ Dermis graft reinforced with bilateral permanent (polypropylene) suture suspension to the sacrospinous ligament (SSL).

Measurements and Main Results: Primary outcome was success of surgery, defined by both subjective and objective results up to 6 months postoperatively. Subjectively, as the resolution of bothersome pelvic prolapse or higher between April 2019 and October 2019

Conclusions: As a POP-Q Stage ≤ 1, Secondary outcomes were complications, retreatment, and reoperation. The average patient age and BMI was 69.8 years and 27.9 kg/m², respectively. The average parity was 2.5. The proportion of women with the pre-op diagnosis of uterovaginal prolapse versus post-hysterectomy vaginal vault prolapse was 72.3% and 27.7%, respectively. The subjective and objective cure rate at 6 months was 97.3% and 94.5%, respectively. There were no major complications. There was one retreatment (with a pessary) at 6 weeks postoperatively. One patient was taken for reoperation for ureteral stent placement after post-op transient ureteral dysfunction.

Open Communications 7: Urogynecology
(3:00 PM — 4:00 PM)

3:42 PM

Isolation of Uterosacral Ligament (USL): A Safe and Effective Way for Laparoscopic USL Hysteropexy / Colpocopy
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*Corresponding author.

Study Objective: Because of the potential complications from artificial mesh, native tissue repair has regained its popularity during pelvic floor reconstruction surgery. Uterosacral ligament (USL) is the most important structures for level I support. However, the attenuated or broken USL in pelvic organ prolapse (POP) patients makes it difficult to get enough strong tissue for durable pelvic support, which result in the high recurrence rate after USL suspension for uterus or vagina cuff. Besides, the close anatomical relationship between USL and other important retroperitoneal structures (ureter, vessels, nerves) and rectum may sometimes limit the accessibility and suture bite during USL colpocopy/hysterectomy. In this video, we will demonstrate the important anatomical structures near the USL, and the technique to isolate it, that will make USL suspension safe and effective.

Design: Video clips from different patients were collected and edited.

Setting: single hospital, single surgeon.

Patients or Participants: Video clips from young patient with minimal endometriosis as normal control (demonstrate transperitoneal view), video clips from patients undergoing nerve-sparing radical hysterectomy as teaching model for detailed retroperitoneal structures, and video clips from patients undergoing USL hysterectomy were collected and edited.

Interventions: Ureter was identified transperitoneally first. Peritoneal window was developed between ureter and USL, entering the Okabayashi pararectal space. All the retroperitoneal structures (including ureter, uterine artery and vein, hypogastric nerve and pelvic plexus) were lateralized. Perirectal space and rectovaginal space were opened, dissecting the rectum away from the USL.

Measurements and Main Results: After USL isolation, USL suspension can be performed with maximal durability (big bite) and safety (minimal risk of ureter kinking, nerve injury, or rectum injury).

Conclusion: Isolation of uterosacral ligament (USL) is a safe and effective way for laparoscopic USL hysterectomy / colpocopy.

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Laparoscopic Ureteroneocystostomy

Study Objective: The purpose of this video is to demonstrate our technique for ureteroneocystostomy via laparoscopy for complete ureteral transaction identified at the time of laparoscopic hysterectomy.

Design: N/A

Setting: Patient was positioned in the standard dorsal lithotomy position. Throughout the entirety of the video the patient is in Trendelenburg position.

Patients or Participants: Our patient was a 42-year-old female with chronic pelvic pain due to symptomatic uterine fibroids and endometriosis. She had a 16-week size uterus and had previously undergone four prior laparoscopic endometriosis resections.

Interventions: The space of Retzius was dissected to promote bladder mobilization. The mobilized bladder was tacked to the sidewall peritoneum to ensure a tension free anastomosis. By stabilizing the proximal ureter on the bladder prior to anastomosis, manipulation of the ureter can be minimized. This may also facilitate easier passage of the ureteral stent.

Measurements and Main Results: We present the minimally invasive management of a complete ureteral transaction identified during total laparoscopic hysterectomy. Postoperative management includes maintaining a ureteral stent for 1-2 months with endoscopic evaluation of the ureter at time of stent removal.

Conclusion: Published rates of ureteral injury in benign gynecologic surgery are approximately 0.08%, with higher risk surgeries including reconstructive surgeries, surgeries for advanced endometriosis or large uteri and surgeries complicated by significant adhesive disease. Ureteroneocystostomy via laparoscopy is a feasible and safe option for management of intraoperatively recognized distal ureteral injury at the time of laparoscopic hysterectomy.
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Comparison of Abdominal and Minimally Invasive Radical Hysterectomy in Patients with Early Stage Cervical Cancer
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Study Objective: The aim of this study was to compare survival outcomes of open radical hysterectomy and minimally invasive radical hysterectomy in early stage cervical cancer.

Design: A retrospective analysis.

Setting: Routine OR setting was done.

Patients or Participants: 148 patients with stage IB1-IIA2 cervical cancer who underwent primary surgery.

Interventions: Minimally invasive radical hysterectomy or open radical hysterectomy.

Measurements and Main Results: Tumor characteristics, recurrence rate, disease-free survival (DFS), and overall survival (OS) were compared according to surgical approach.

In total, 110 and 38 patients were assigned to open surgery and MIS groups. After a medical follow-up of 42.1 months, the groups showed similar survival outcomes (recurrence rate, DFS, and OS). However, in patients with tumor size >2 cm, recurrence rate was significantly higher in MIS group (22.5% vs 8%; p=0.008). And MIS group had significantly poorer DFS than open surgery group (p=0.017), although OS was similar between the two groups (p=0.252).

Conclusion: In patients with tumor size >2 cm, MIS was associated with higher recurrence rates and poorer DFS than open surgery. However, in patients with tumor size ≤2 cm, MIS did not seem to compromise oncologic outcomes.

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Laparoscopic Radical Hysterectomy with Enclosed Colpotomy Using Surgical Stapler for Early-Stage Cervical Cancer
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Study Objective: To report the application of Ethicon Endo-Surgery reusable linear cutter (Ethicon endocutter) in vaginal closure without usage of uterine manipulator to prevent tumor spillage in laparoscopic radical hysterectomy for early-stage cervical cancer.

Design: A step-by-step explanation of the procedures using a video.

Setting: Hospital for women’s health teaching and research.

Patients or Participants: This is a 41-year-old woman with clinical stage IB1 cervical squamous cell cancer.

Interventions: After the contraindication was removed, laparoscopic type C radical hysterectomy with pelvic lymph node dissection and ovarian transposition were performed, the surgery was finished without usage of uterine manipulator. The patient signed an informed consent that allows us to use her clinical data.

Measurements and Main Results: In this method, after completion of the radical hysterectomy procedures, an Ethicon endocutter was placed into abdominal cavity through a 12-mm trocar. The uterus was elevated with fixed sutures on the uterus. Then, the stapler was placed. Before the surgical stapler was fired to close the vagina, we should check that no other unintended structure was included in the jaws of the stapler. After being fired, the stapler places 2 triple-staggered rows of titanium staples and simultaneously knife blade cuts between them. Once the vagina has been divided, the stapler was released. The upper part of the vaginal cuff was excised and checked by pathology as a surgical margin, and the uterus was removed through the vagina. Finally, the vaginal cuff was closed with absorbable barbed sutures.

Conclusion: Vaginal closure with Ethicon endocutter before colpotomy is a useful and effective procedure to block vaginal cuff and prevent tumor spillage during laparoscopic radical hysterectomy of cervical cancer.

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A Case of Robotic Radical Parametrectomy for the Treatment Uterine Cervical Cancer Discovered after Simple Hysterectomy.
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*Corresponding author.

Study Objective: Radical parametrectomy (RP) is one of effective treatment option for patients with invasive cervical cancer incidentally diagnosed after simple hysterectomy. To demonstrate the technique of robotic RP as a minimally invasive approach.

Design: A case report

Setting: Gynecology and Obstetrics department of a general hospital.

Patients or Participants: N/A

Interventions: A 50-year-old woman, G1P1 with previous cesarean section, underwent robotic simple hysterectomy and bilateral salpingooophorectomy for the treatment of adenomyosis. Cervical cytology before surgery was negative (NILM). The final pathological examination showed stage 1B1 cervical cancer, 19mm-basaloid carcinoma with LVSI (lymph vascular space invasion) and positive surgical margin. Basaloid carcinoma of the uterine cervix is a more aggressive tumor than SCC. Robotic RP with an upper vaginectomy and pelvic lymphadenectomy was performed as an adjuvant treatment. The operative time was 343min, the estimated blood loss was 400ml, and the number of pelvic lymph nodes removed was 65. Right ureteral adventitia injury was suspected during surgery because of severe pelvic adhesion related with previous surgery, so we successfully repaired it with ureteroneocystostomy and there were no postoperative complications. 1mm-pathological residual disease of basaloid carcinoma in the resected tissue was found (pTb1N0M0). She received adjuvant chemotherapy and no recurrence has been observed.

Measurements and Main Results: Results to be presented

Conclusion: The indications for RP have been unclear as the surgical procedure is difficult and may possibly increase the complication rate. Robotic surgery may make RP a more feasible option depending on the individual case.

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Robotic Nerve Sparing Radical Hysterectomy with Cerclage Evolving Technique Post LACC Trial Era
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Study Objective: To evaluate the feasibility of the novel technique of robotic assisted radical hysterectomy with cerclage.

Design: Prospective patients who underwent robotic assisted radical hysterectomy with cerclage (RARHC) were evaluated for intraoperative outcomes such as operative time, blood loss, conversion, and complications. The pathological specimen outcomes such as parametria length, vaginal cuff margin, number of lymph nodes retrieved, grade, histology, LVSI and
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Robotic Extraperitoneal Para-Aortic and Pelvic Lymphadenectomy with the Aid of the Double Bipolar Method

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Study Objective: To evaluate the efficacy of robotic extraperitoneal para-aortic dissection using the double bipolar method (DBM).

Design: We will show our double bipolar technique and give retrospective analysis of data.

Setting: Urban general hospital.

Patients or Participants: From December 26th 2018 to April 22nd 2019, 13 patients underwent extraperitoneal paraaortic dissection and 3 patients underwent both paraaortic and pelvic extraperitoneal dissection for stage I ovarian cancer (n=5) and endometrial cancer (n=8) - stage I-III.

Interventions: Informed consent was gained from all patients. Under laparoscopic observation, we accessed the retroperitoneal space at the lower left flank extraperitoneally using an Endotip cannula. We expanded the peritoneal pocket to establish pneumo-retroperitoneum. Four extraperitoneal trocars were inserted through the left flank. The DBM was originated by a robotic gastrointestinal surgeon, Prof Ichiro Ulyama. This technique uses Robotic Maryland forceps for both cutting and coagulation. The cutting device is set with a special energy platform at macromode 60W. The lightning strike cutting mechanism is more precise than other instrumentation such as monopolar scissors and causes minimal thermal spread to adjacent organs.

Measurements and Main Results: The average operative time was 214 minutes with estimated blood loss of 112 cc. The average length of hospitalizations was 21 hours. There was no conversion, complications, or readmission.

Conclusion: Robotic assisted radical hysterectomy with Cerclage is feasible and safe. Long term outcomes compared to other surgical modalities will be reported in the future.

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Minimally Invasive Surgery Is an Effective Modality for Interval Cytoreduction in Advanced Ovarian Cancer: A Multi-Institutional Study

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Study Objective: We sought to compare the surgical and oncologic outcomes of minimally-invasive surgery (MIS), including laparoscopic (L-IDS) and robotic-assisted (R-IDS), versus laparotomy (O-IDS) in patients with advanced epithelial ovarian cancer (EOC) undergoing neoadjuvant chemotherapy (NAC).

Design: Demographic, clinical, and pathologic factors were abstracted from electronic medical records. Progression-free survival (PFS) and overall survival (OS) were analyzed on a Kaplan-Meier estimator using the log-rank method.

Setting: N/A

Patients or Participants: All consecutive patients with stages III to IV EOC who underwent NAC followed by IDS from 2008-2018 at three tertiary care centers were included in this retrospective cohort study.

Interventions: N/A

Measurements and Main Results: A total of 415 patients underwent IDS through L-IDS (n=78), R-IDS (n=44), or O-IDS (n=293). The median age of diagnosis was 65.2 and did not differ between MIS and open cohorts (p=0.1). MIS patients underwent more NAC cycles (4.1 vs 3.8, p=0.05) and less adjuvant cycles (3.0 vs 3.4, p=0.01); total cycles received were no different (7.0 vs 7.2, p=0.3). Rates of R0 (66% vs 46%, p<0.001) and optimal resection (93% vs 84%, p=0.02) were higher in patients undergoing MIS. O-IDS patients had more complex surgeries, measured by an Aletti surgical complexity score of 3 or more (36% vs 19%, p<0.001). MIS patients had less surgical blood loss (182 vs 326 cc, p<0.001), intraoperative transfusions (4% vs 25%, p<0.001), length of stay (2.2 vs 5.9 days, p<0.001), and postoperative complications (20% vs 43%, p<0.001). MIS patients had a longer median PFS (18.2 vs 15.1 months) and OS (40.9 vs 36.7 months) but differences were not statistically significant (p=0.051, p=0.5).

Conclusion: MIS is feasible and effective for IDS after NAC in patients with advanced EOC. Surgical outcomes appear to be advantageous in MIS compared with O-IDS, and oncologic outcomes appear to be no different.

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Using Regression Models to Predict Surgery Duration for Robotic-Assisted Total Laparoscopic Hysterectomy in Endometrial Cancer

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Study Objective: To develop regression models using preoperative variables that can accurately predict the operating room time of robotic surgery for endometrial cancer.

Design: A retrospective review using preoperative variables including age, BMI, ASA score, surgery start time, preoperative diagnosis, number of previous abdominal surgeries, parity, and uterine volume were used to
develop regression models. These regression models were compared to institutional models that used preoperative estimations of operating room times based on historical averages.

Setting: An urban, academic hospital.

Patients or Participants: 348 patients undergoing robotic-assisted total laparoscopic hysterectomy with staging for endometrial cancer between 2016-2020 by six surgeons.

Interventions: N/A

Measurements and Main Results: The mean operating room time was 234 minutes (range: 130 – 484). The mean preoperative estimated operating room time was 223 minutes (range: 120 – 390). Linear, ridge, lasso, and elastic net models had relatively similar performance measures, and all models outperformed preoperative estimated operating room duration. Ultimately, the elastic net model performed the best. Elastic net had the smallest median root mean square error (RMSE) 57.97 (CI of 54.44-61.72) and greatest median R-squared 0.22 (CI 0.18-0.26). Surgery start time and preoperative diagnosis were found to be most influential variables in predicting operating room time followed by BMI, uterine volume, and number of prior surgeries. Age, ASA, parity and surgery type were not important in predicting operating room time.

Conclusion: Regression modeling more accurately predicted operating room time than the institutional standard that used historical averages for robotic-assisted hysterectomy with staging for endometrial cancers. This study is novel in its application to the field of robotic surgery in gynecologic oncology as it builds off of previous work from other disciplines demonstrating improved OR time predictions with regression models. Further studies are needed with expanded databases and more robust variable sets to refine the models ability to account for variance.

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Factors Associated with Prolonged Ambulatory Surgery
Stay for Major Gynecologic Surgery
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Study Objective: To identify factors associated with overnight admission after major minimally invasive gynecologic surgery, and create a prediction model.

Design: Retrospective cohort study.

Setting: Academic Medical Center.

Patients or Participants: Patients undergoing major minimally invasive surgery by a single surgeon between 2018 and 2020.

Interventions: Pre-operative patient characteristic data and peri-operative data were collected retrospectively. Logistic regression analysis of factors associated with same-day discharge versus overnight admission was performed.

Measurements and Main Results: 461 major minimally invasive cases were identified, of which 425 cases were considered eligible for ambulatory surgery discharge and were included in the analysis. 279 (65.6%) patients were discharged same-day, and 146 (34.4%) were admitted. Patients with later procedure start times (OR 0.9), cancer pathology (OR 0.4), high four-hour postoperative pain scores (OR 0.8), and presence of urinary catheter in the recovery room (OR 0.1) had significantly decreased likelihood of same-day discharge. A prediction model including nineteen patient characteristic and peri-operative variables explained 57.8% of the variability of whether or not patients were admitted after surgery. The model correctly predicted 69.3% of admissions and 90.1% of same-day discharges, giving an overall prediction rate of 82.4%. 7 (2.5%) patients discharged same-day and 4 (2.7%) patients admitted returned to the emergency room within 30 days; 1 (0.4%) patient discharged same-day and 4 (2.7%) patients admitted had a readmission within 30 days.

Conclusion: Peri-operative factors such as surgery start time, postoperative pain level, presence of urinary catheter in the recovery room as well as diagnosis of malignancy are predictive of overnight admission. Postoperative hospital stay does not improve 30-day readmission rates or the number of ER visits after the discharge. Knowledge of factors associated with prolonged stay after major ambulatory surgery can aid in counseling and peri-operative planning.

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Is Diagnostic Hysteroscopy Safe for the Investigation of Type 2 Endometrial Cancer? a Retrospective Cohort Analysis
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Study Objective: Although hysteroscopy can be used for assessing the uterine cavity in women with suspected, endometrial cancer, it remains controversial as a procedure that can enhance metastasis spread. Endometrial cells may shed during hysteroscopy and be passively transported with fluid into the peritoneal cavity. Moreover, it is important to assess this hypothesis into type 2 endometrial cancer, a more aggressive phenotype that usually presents with endometrial atrophy and worse prognosis. Thus, we aimed to assess the prevalence of positive peritoneal cytology in type II endometrial cancer in women undergoing hysteroscopy as a diagnostic tool and determine their prognosis.


Setting: Tertiary, academic hospital.

Patients or Participants: 127 women with type II endometrial cancer.

Interventions: Diagnostic hysteroscopy (HSC)(n=43) or dilation/curettage (D&C)(n=84).

Measurements and Main Results: Clinical and pathologic characteristics, including peritoneal cytology results were reviewed. Survival curves were projected using the Kaplan-Meier method and compared using the log-rank test. Cox regression analysis with hazard ratio plus 95% confidence intervals were calculated to assess factors related to disease-free survival (DFS). There was no difference with regard to age between the groups. The D&C group showed a higher frequency of advanced stage and greater vascular invasion (p = 0.008 and p = 0.04 respectively). Positive cytology was found in 2/43 (4.6%) women following HSC and in 9/84 (10.7%) following D&C (p = 0.22). There was no statistically significant difference in the survival curve between groups. Multivariate analysis for DFS has shown that advanced staging (III and IV) (HR=3.89[1.98-7.66];p<0.001), advanced age (HR=1.073[1.028-1.119];p=0.001) and vascular invasion (OR=3.01[1.53-5.91];p=0.001) increases the risk of recurrence.

Conclusion: Diagnostic HSC did not increase the rate of positive peritoneal cytology at the time of surgical staging in this cohort of women with type II endometrial cancer and presented equal safety when compared to D&C.
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Every Inch Counts: A Prospective Randomized Trial of Anti-Slip Surfaces in Minimally Invasive Gynecologic Surgery

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Study Objective: To assess the effectiveness of common anti-slip surfaces on reducing intra-operative patient displacement while in Trendelenburg

Design: Prospective randomized controlled trial with a minimum 6-week post-operative follow up

Setting: Patient positioning with Trendelenburg

Patients or Participants: Patients undergoing major laparoscopic or vaginal surgery (hysterectomy or surgery >2 hours) were randomly assigned to one of three anti-slip surfaces: Pink Pad, Action O.R. Overlay (gelpad) or Olympic Vac-Pac (beanbag) from 6/2018-12/2019. 159 patients were enrolled with 148 found to be eligible.

Interventions: Patients were randomized 1:1:1 one of the three anti-slip surfaces.

Measurements and Main Results: Patients were pre-operatively assigned to one of three anti-slip surfaces. Intra-operative displacement was assessed by measuring multiple anatomic landmarks [perineum, anterior superior iliac spine (ASIS), umbilicus, acromion and the head] at three times during the case: 1) pre-op, 2) when placed in Trendelenburg, and 3) prior to leveling. Positioning time and time added due to obstructed uterine manipulation were recorded. There was significantly less total movement on the Pink Pad at all anatomic landmarks compared to the gelpad (2.75-5.66cm) and for the torso (ASIS & perineum) compared to the beanbag (1.22-2.69cm). The most consistent predictors of movement included: height, weight, and body mass distribution. Obesity increased displacement by 32-55%. Surgery type, length of surgery, and maximum Trendelenburg did not predict displacement. Laparoscopic surgery with robotic assistance had greater displacement than without (p<0.011) but this difference resolved after controlling for population differences. The Pink Pad was 19.2% (p=0.042) and 30.8% (p<0.001) faster to position than the gelpad and beanbag respectively. Uterine manipulation time was 5.8 times longer (p=0.023) on the beanbag vs. the Pink Pad.

Conclusion: Patients on the Pink Pad had significantly less displacement to Trendelenburg and faster positioning compared to the other surfaces. Obesity is a major predictor of movement. Uterine manipulation was easier on the Pink Pad than the beanbag.

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Taking "Charge" in the Operating Room: Tips for Safe Use of Monopolar Devices

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Study Objective: To present common pitfalls that can occur when using monopolar devices and recommendations for avoiding inadvertent patient injury and maximizing efficiency. These pitfalls include: Incorrect placement of dispersive electrode

Inappropriate power settings and current waveforms
Current leakage
Inadvertent contact
Direct coupling
Stray current
Eschar accumulation
Narrow return circuit
Decreased current density
Insufficient tension
Wet field

Design: Video Demonstration.

Setting: Operating room.

Patients or Participants: N/A.

Interventions: Video Demonstration.

Measurements and Main Results: N/A.

Conclusion: Monopolar devices, such as the laparoscopic L-hook and scissors, are commonly used in minimally invasive gynecologic surgery and play a crucial role in many procedures. There are several important pitfalls to consider when using monopolar devices to maximize safety and efficiency.
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Laparoscopic Inguinal Gonadectomy in a Case of Familial Complete Androgen Insensitivity Syndrome and Inguinal Mass
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Study Objective: Technical video demonstrating steps of inguinal gonadectomy in a case of complete androgen insensitivity syndrome (CAIS) with gonads in the inguinal canal.

Design: Technical video (Canadian Task Force classification III).

Setting: Gynecology department at a tertiary care hospital.

Patients or Participants: A patient with CAIS and inguinal mass.

Interventions: Laparoscopic inguinal gonadectomy and peritoneal closure at deep inguinal ring.

Measurements and Main Results: Androgen insensitivity syndrome (AIS) is a X-linked disorder of sex development with androgen receptor resistance. Phenotypic females with primary amenorrhea along with presence of testes and XY karyotype is diagnostic of AIS. Gonadectomy is usually advised in these patients as they are at risk of testicular germ cell tumor in undescended testis. The testes can be located at any position of embryological descent pathway. The patient in the present video is a 21 years old unmarried female with CAIS and testes present in inguinal canal. Her two siblings were also diagnosed with the same syndrome and one had undergone gonadectomy through inguinal incision. Laparoscopic inguinal gonadectomy is a minimally invasive approach with less intraoperative complications and pain, shorter hospital stay, faster postoperative recovery and aesthetically smaller scars. Laparoscopic inguinal gonadectomy is technically challenging as gonads are located in inguinal canal. We performed laparoscopic peritoneum dissection at the level of deep inguinal ring, identified the gonads and traction was applied aided with external push at level of external inguinal ring for successful retraction of gonads. Adequate closure of peritoneum at site of deep inguinal ring will prevent inguinal hernia in future.

Conclusion: Laparoscopic inguinal gonadectomy although technically difficult should be preferred over open inguinal incision to reduce postoperative morbidity.

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Comparing Total Laparoscopic Hysterectomy (TLH) Versus Total Vaginal Hysterectomy (TVH) in Large Uteri
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Study Objective: To compare surgical outcomes between total laparoscopic (TLH) and total vaginal (TVH) hysterectomy with uterine weight (UW) ≥ 250 grams.

Design: Retrospective cohort study using 1:2 propensity score (PS) matching. PS was calculated using preoperative characteristics and UW. Pairwise analysis was performed using Wilcoxon rank-sum and Fisher’s exact tests as appropriate. Multivariable logistic regression was performed to identify the independent impact of TVH on surgical outcomes.

Setting: American College of Surgeons National Quality Improvement Project Hysterectomy Specific Database.

Patients or Participants: Women undergoing benign hysterectomy for UW ≥ 250g.

Interventions: TLH or TVH.

Measurements and Main Results: There were 1,870 TVH that met all criteria for inclusion and matched to 3,740 TLH. There were no differences in preoperative demographics and comorbidities. UW was similar for both groups (376 g (IQR: 293-501) for TVH and 384 g (IQR: 302-515) for TLH, p=0.07). TVH was completed in less time than TLH, 77 (IQR: 56-111) versus 122 (IQR: 91-164) minutes, p<0.001. The rate of composite major complications was similar in the TVH compared to the TLH group, 4.3% vs 5.3%, p=0.31. TVH was associated with higher rates of perioperative transfusion (1.7% vs 1.1%, p=0.01) and intraoperative cystotomies (0.8% vs 0.3%, p=0.01), and TLH was associated with more ureteral injuries (0.6% vs 0.2%, p=0.02). After adjusting for confounders, TVH was not found to be independently associated with major morbidity (aOR=0.95, 95%CI: 0.18-5.11) or minor morbidity, readmission, reoperation, or prolonged hospitalization. TVH was associated with shorter operating times (aOR=0.55, 95%CI: 0.27-1.14).

Conclusion: In patients with similar preoperative characteristics and uterine weight TVH is not associated with an increased risk of major surgical morbidity or other adverse surgical outcomes.

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Does Your Anesthesiologist Really Matter?
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Study Objective: To investigate the impact of a consistent anesthesiologist for laparoscopic hysterectomy on time to discharge and same-day discharge.

Setting: An academic medical center.

Patients or Participants: Two hundred and twenty patients who underwent laparoscopic hysterectomy for benign indications.

Interventions: Outpatient laparoscopic or robotic-assisted hysterectomy between 2018 and 2019.

Measurements and Main Results: A total of 220 patients were included in the study with 99 patients who had a single consistent anesthesiologist and 121 patients who had inconsistent anesthesiologists from a large anesthesia provider group. Demographic and preoperative characteristics between groups were similar, except patients with an inconsistent anesthesiologist were more likely to be tobacco users (p = .005). Surgery variables not controlled by the anesthesiologist were similar between groups including operative time, uterine weight, urine output, and estimated blood loss. Variables which are controlled by the anesthesiologist at our institution included intraoperative and recovery room opioids, NSAIDS, and intravenous (IV) fluids. The consistent anesthesiologist gave intraoperative and recovery fentanyl more frequently than morphine and hydromorphone, gave more IV ketorolac, and gave less IV fluids (500mL versus 1000mL, p < .001). Patients with the consistent anesthesiologist had a significantly shorter time to discharge (193 minutes versus 219 minutes, p = .032) and a higher rate of same-day discharge (94% versus 77%, p = .001). Postoperative emergency department and urgent care visits were similar between groups. A linear regression model showed more IV fluids and use of recovery room morphine were independent predictors of longer time to discharge, as well as were...
preoperative scopolamine and tobacco use. A logistic regression model showed that patients are 4.4 times more likely to not achieve same-day discharge if they have one of the inconsistent anesthesiologists (p=.021).

**Conclusion:** The presence of a single consistent anesthesiologist significantly shortened the time to discharge and improved the success of same-day discharge after outpatient laparoscopic hysterectomy.

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**3:36 PM**

**Laparoscopic Transabdominal Cerclage: A Reusable Simulation Model**

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**Study Objective:** To develop a low-fidelity, low-cost, easy to assemble and reusable simulation model for practicing laparoscopic transabdominal cerclage placement.

**Design:** N/A.

**Setting:** A low-fidelity simulation set up in a laparoscopic box trainer.

**Patients or Participants:** N/A.

**Interventions:** The assembly and use of a laparoscopic transabdominal cerclage simulation model is demonstrated.

**Measurements and Main Results:** Five models can be created with approximately $25 worth of material from a craft store as well as surplus medical supplies. Assembly was performed by a single person using glue, duct tape and needles/thread.

**Conclusion:** A low cost, easy to assemble and reusable low-fidelity simulation model was created using materials from a craft store and surplus medical supplies. This model was used to demonstrate laparoscopic transabdominal cerclage placement and removal with surgical footage for comparison and with relevant tips and tricks.

Open Communications 9: Laparoscopy
(3:00 PM — 4:00 PM)

**3:42 PM**

**Laparoscopic Ilioinguinal Nerve Excision**

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*Corresponding author.

**Study Objective:** This surgical video presents the case of a 27yo woman with neuropathic right lower quadrant pain failing other interventions. She underwent a laparoscopic excision of the ilioinguinal nerve.

**Design:** Case review and video footage of a laparoscopic proximal ilioinguinal nerve excision.

**Setting:** Academic teaching hospital operating room.

**Patients or Participants:** One case presented and followed through from initial history and physical exam, to operation, to post-operative visit. Consent was obtained for all photographs and video footage obtained for the purpose of creating this video.

**Interventions:** Proximal excision of a 5cm segment of ilioinguinal nerve.

**Measurements and Main Results:** Pain mapping showed resolution at the 8 week post-operative visit.

**Conclusion:** Laparoscopic proximal excision of the ilioinguinal nerve is a viable option for patients with debilitating pelvic and groin pain caused by ilioinguinal nerve entrapment.

Open Communications 9: Laparoscopy
(3:00 PM — 4:00 PM)

**3:48 PM**

**Ultrasound Visceral Slide Assessment to Detect Adhesions in Patients Undergoing Abdominal Surgery — a Systematic Review and Meta-Analysis**

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**Study Objective:** To determine the diagnostic accuracy of preoperative visceral slide assessment with ultrasound to detect intra-abdominal adhesions, compared to the gold standard of intraoperative findings.

**Design:** Systematic review and meta-analysis, prospectively registered with the International Prospective Register of Systematic Reviews (PROSPERO).

**Setting:** Abdominal entry at time of laparoscopy is a critical step with risk of injury to underlying viscera due to bowel adhesions. Ultrasound can be used as a preoperative tool to assess slide of viscera underneath the abdominal wall in order to detect adhesion-free areas.

**Patients or Participants:** Prospective and cross-sectional studies in English that included patients at risk for adhesions, undergoing ultrasound visceral slide assessment followed by abdominal surgery.

**Interventions:** N/A

**Measurements and Main Results:** 3737 articles were screened through electronic searches of Cochrane, MEDLINE, EMBASE, and Google Scholar databases. Reference lists of relevant articles were searched for further articles. Two reviewers independently selected articles, extracted data, and assessed bias using the Quality Assessment of Diagnostic Accuracy Studies-2 tool. Primary authors were contacted for additional relevant data. Twenty-five articles reported on 1620 patients and 6166 assessed abdominal adhesions, with considerable heterogeneity of described abdominal areas and degrees of adhesions. Only 5 studies were performed blinded and 21 had high risk of selection bias. The periumbilical area was assessed for bowel adhesions in 869 patients in 11 studies, with 12.2% reported to have adhesions. Ultrasound assessment for periumbilical bowel adhesions had a combined sensitivity of 93.5% (95% confidence interval, 87.0-97.3), specificity of 91.7% (89.6-93.6), positive predictive value of 61.4% (55.5-66.9), and negative predictive value of 99.0% (98.0-99.5).

**Conclusion:** Visceral slide assessment with ultrasound has a high negative predictive value for absence of bowel adhesions in patients at risk for adhesions and should be considered a useful tool to detect adhesion-free areas to assist with safe laparoscopic entry.

Open Communications 10: Endometriosis
(3:00 PM — 4:00 PM)

**3:00 PM**

**No Regrets: Surgical Decision Regret in Women Pursuing Surgery for Endometriosis or Chronic Pelvic Pain**

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*Corresponding author.

**Study Objective:** Identify incidence of decision regret associated with surgery for endometriosis or pelvic pain.

**Design:** survey study.

**Setting:** academic medical center.

**Patients or Participants:** all patients who underwent surgery for endometriosis or chronic pelvic pain (CPP) from January 2016 to June 2019
Interventions: Questionnaire.
Measurements and Main Results: 253 patients were contacted to complete a survey consisting of two validated questionnaires: the decision regret scale (DRS) and the patient global impression of improvement (PG-I). 154 patients responded (60.8% response rate). 137 women (90%) agreed or strongly agreed that having surgery for endometriosis or CPP was the right decision. 134 women (87%) indicated they would choose to have surgery again. On the PG-I scale, 96 women (62.7%) reported feeling very much better or much better than before surgery. Survey responders did not differ from non-responders in age (years, 33.9 vs 35, p=0.25), robotic route of surgery (83.1% vs. 78.8%, p=0.66), or performance of hysterectomy (27.3% vs. 26.3%, p=0.85). Responders were more likely to have stage III/IV endometriosis (50.6% vs. 29.3% p<0.01), more previous surgeries for endometriosis (surgeries, 1.5 vs 0.9, p=0.01), higher rate of complications (8.4% vs. 2%, p=0.03), and pathology more frequently positive for endometriosis (87.7% vs. 77.8%, p=0.03).
Overall, 25 patients (16.3%) reported some level of regret after surgery for endometriosis or CPP. Regret was not associated with lower PG-I score (OR: 1, CI: 0.97-1.04), number of previous surgeries (OR: 1.08, CI: 0.9-1.31), pathology negative for endometriosis (OR 2.82, CI 0.95-8.32), hysterectomy (OR: 0.82, CI: 0.30-2.21), or complications (OR: 1.07, CI: 0.22-5.16).
Conclusion: Most women who pursue surgery for endometriosis or CPP are satisfied with their decision. Regret was not associated with lower PG-I score, negative pathology for endometriosis, performance of hysterectomy, or complications. Gynecologic surgeons should engage in shared decision-making with patients considering surgery for endometriosis or CPP.

Open Communications 10: Endometriosis
(3:00 PM — 4:00 PM)

3:06 PM
Isolated Sciatic Nerve Endometriosis
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Study Objective: Sciatic Nerve Endometriosis is rarely observed. Symptoms include sciatica, gluteal pain, and sometimes, locomotion problems without bladder dysfunction or Pudendal pain. Clinical gynecological pelvic examination in these patients is usually unremarkable.

Design: Case report with surgical technical details and anatomical landmark discussion.

Setting: Gynecologic Endoscopic Unit in a Tertiary Care Private Clinic.

Patients or Participants: 46-year-old patient with multiple leiomyomas and chronic pelvic pain. 3 years with progressive sciatic pain (right hip and buttock pain), alteration of sensation along L5 and S1 dermatomes with a perceived reduced power in the right ankle. All showed severe exacerbation during menstruation. Besides uteromegaly, her pelvic gynecological examination was normal. Pelvic MRI showed a 3.4 cm endometriotic lesion over the pelvic segment of her right sciatic nerve, before exiting the great sciatic foramen.

Interventions: Laparoscopic access to the Lumbosacral space and sciatic nerve cold scissors shaving.

Measurements and Main Results: The patient recovered well from her surgery. She complained of exacerbation of neurological symptoms immediately after surgery, specifically lower limb paresthesia over the first few days. After a week she had significant improvement of pain and after one year she is asymptomatic.

Conclusion: Exploration of lumbosacral space should not be undertaken lightly due to its complex anatomy and potential for serious injury to the major neurovascular structures. Once the procedure is started, resection of the lesions must be fully completed to avoid further surgical interventions which are always more challenging than the preceding one.

Open Communications 10: Endometriosis
(3:00 PM — 4:00 PM)

3:12 PM
Stepwise Approach to the Medical and Surgical Management of Endometriosis-Related Dysmenorrhea: A Cost-Effectiveness Analysis
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Study Objective: To evaluate the cost-effectiveness of sequential therapy for the treatment of endometriosis-related dysmenorrhea.

Design: A cost-effectiveness model was created to compare four stepwise treatment strategies for dysmenorrhea. Probabilities, utilities, and costs were derived from the literature. Outcomes included cost, quality-adjusted life years (QALYs), and incremental cost-effectiveness ratios (ICER). Univariate, bivariate, and multivariate sensitivity analyses were performed.

Setting: Healthcare payor perspective

Patients or Participants: Study cohort derived from the estimated number of women, aged 18-45 in the US with endometriosis-related dysmenorrhea.

Interventions: Treatment strategies modeled - (Strategy 1) Nonsteroidal anti-inflammatory drugs (NSAIDs) followed by surgery; (Strategy 2) NSAIDs, then short acting reversible contraceptives (SARCs) or long acting reversible contraceptives (LARCs) followed by surgery; (Strategy 3) NSAIDs, then a SARC or LARC, then a gonadotropin releasing hormone (GnRH) modulator followed by surgery; (Strategy 4) proceeding directly to surgery.

Measurements and Main Results: In this theoretical cohort of 4,817,894 women with endometriosis-related dysmenorrhea, all four treatment strategies were cost-effective at a standard willingness-to-pay threshold of $100,000 per QALY gained. Strategy 2 was associated with the lowest cost per QALY gained ($1,155). Requiring trial of a GnRH modulator prior to surgery would cost an additional $257 million, compared with proceeding to surgery after failing two medical treatments. The probability of improvement with surgery would need to exceed 83% for this to be the preferred first line approach.

Conclusion: All modeled management strategies for endometriosis-related dysmenorrhea were cost-effective. A trial of hormonal management after NSAIDs, before proceeding to surgery, may provide cost savings. Delaying surgical management in an individual with pain refractory to more than three medications may decrease quality of life and increase cost.

Open Communications 10: Endometriosis
(3:00 PM — 4:00 PM)

3:18 PM
Thinking Outside the Peritoneal Cavity: A Novel Approach to a Rare Disease
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Study Objective: The objective of this video is to describe a novel surgical approach to hepatic endometriosis invading the retroperitoneum.

Design: Video case presentation.

Setting: Tertiary care academic medical center.
**Open Communications 10: Endometriosis**

(3:00 PM — 4:00 PM)

3:24 PM

**A Masquerade Ball: Polypoid Endometriosis Mimicking Peritoneal Carcinomatosis**

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*Corresponding author.

**Study Objective:** To present the identifying characteristics of polypoid endometriosis as well as techniques for safe and effective resection of the disease.

**Design:** Stepwise demonstration of characteristics and techniques with narrated video footage.

**Setting:** Polypoid endometriosis is a rare variant of endometriosis first described in 1980. It microscopically resembles an endometrial polyp and is significantly associated with unopposed estrogen. It can precede premalignant and malignant conditions and has been reported in pre- and post-menopausal women. In this video, we review the visual characteristics of polypoid endometriosis as well as principles for safe and efficient resection of the disease.

**Patients or Participants:** A 60-year-old female with multiple abdominopelvic soft tissue nodules on CT scan concerning for peritoneal carcinomatosis. CT-guided biopsy demonstrated endometriosis, and the patient underwent laparoscopic cytoreductive surgery.

**Interventions:** When viewed laparoscopically, polypoid endometriosis appears as a lesion with irregular borders surrounded by scarring and fibrosis. Neovascularization appears commonly in these implants. The key principles for safe and effective resection of polypoid endometriosis include:

- Defining the borders of the lesion via palpation and thinning of the surrounding tissue
- Thoughtful instrument choice to minimize instrument switching during surgery
- Meticulous hemostasis to preserve visualization and prevent tissue staining
- Performance of ureterolysis, if necessary, to mobilize this structure away from the intended area of dissection
- Maintenance of a margin around the lesion to ensure complete resection

**Measurements and Main Results:** The patient recovered well without any postoperative complications.

**Conclusion:** Polypoid endometriosis should be a diagnostic consideration when imaging suggests peritoneal carcinomatosis.

Open Communications 10: Endometriosis

(3:00 PM — 4:00 PM)

3:30 PM

**Effect of Elagolix in Women with Moderate to Severe Pelvic Tenderness or Induration: Results from Elaris EM-I and EM-II Clinical Trials**

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*Corresponding author.

**Study Objective:** Evaluate efficacy and safety of elagolix in women with endometriosis and moderate/severe pelvic tenderness or induration.

**Design:** Subset analyses of pooled 6-month, randomized, double-blind, placebo-controlled phase 3 studies, Elaris EM-I and EM-II.

**Setting:** Multicenter clinical trials.

**Patients or Participants:** Premenopausal women (18-49) with surgically diagnosed endometriosis and moderate/severe endometriosis-associated pain.

**Interventions:** Randomized 3:2:2 to placebo, elagolix 150mgQD, and elagolix 200mgBID.

**Measurements and Main Results:** Of 1686 women randomized/treated, 66% had moderate/severe pelvic tenderness and 35% had moderate/severe induration on pelvic exam at baseline. Among women with moderate/severe pelvic tenderness, the proportion of responders with a decrease in dysmenorrhea [placebo, 20.3%; 150mgQD elagolix, 43.3%; 200mgBID elagolix, 73.6%] and nonmenstrual pelvic pain (NMPP) [placebo, 34.6%; 150mgQD elagolix, 47.8%; 200mgBID elagolix, 56.6%] at M3 was statistically significant (P<0.001) for both elagolix doses versus placebo. Similar results were demonstrated in moderate/severe induration for dysmenorrhea [placebo, 23.0%; 150mgQD elagolix, 46.1%; 200mgBID elagolix, 75.9%] and NMPP [placebo, 38.3%; 150mgQD elagolix, 53.9%; 200mgBID elagolix, 59.9%] at M3. In women with moderate/severe pelvic tenderness, the proportion of responders with a decrease in dyspareunia was significantly greater for elagolix 200mgBID versus placebo at M3 and M6. For women with moderate/severe induration, the proportion of responders with a decrease in dyspareunia at M6 was significantly greater with elagolix 200mgBID versus placebo. Dysmenorrhea and NMPP reductions from baseline to M6 were superior for both elagolix doses compared to placebo in both subsets; dyspareunia reductions at M6 were superior to placebo with elagolix 200mgBID. Common adverse events for elagolix-treated women were hot flush, headache, nausea, insomnia, and amenorrhea.

**Conclusion:** In women with baseline moderate/severe pelvic tenderness or moderate/severe induration on exam, elagolix 150mgQD and 200mgBID significantly reduced dysmenorrhea and NMPP, and elagolix 200mgBID significantly reduced dyspareunia versus placebo. These results are consistent with the overall Elaris EM-I and EM-II results.

Open Communications 10: Endometriosis

(3:00 PM — 4:00 PM)

3:36 PM

**Upper Abdomen and Thoracic Endometriosis Infiltrating the R. Diaphragm, Liver, Lung, Pericardium and Perirenal Area. Laparoscopic Approach**

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**Study Objective:** The purpose of this video is to demonstrate the technical feasibility of using laparoscopy for endometriosis excision involving multiple organs in the upper abdomen and chest (frozen upper abdomen).
Design: Laparoscopy was performed to remove a rare case of endometriosis infiltrating the right diaphragm with extension to the liver, lung, pericardium, and right renal area. The preoperative diagnosis and mapping of the lesions were performed through MRI and Ultrasound. Endometriosis of the appendix, terminal ileum, and frozen pelvis was also diagnosed and were treated later.

Setting: The patient was placed in the dorsal decubitus position with the upper right limb elevated, the arm semi-flexed and fixed on a support at face level. A 3D camera with a 30˚ lens was inserted into the umbilicus and four auxiliary punctures were placed in the upper abdomen.

Patients or Participants: A 32-year-old patient with disabling pain in the upper abdomen, epigastric region, right shoulder and neck, with breathing difficulties and not responding to clinical treatment.

Interventions: Resection of the lesions involving the right diaphragm, right lung, pericardium, liver and right renal region was performed using the laparoscopic technique. Diagnostic thoracoscopic helped to visualize the pulmonary involvement and mesh was used to close the diaphragm. The procedure lasted 460 min. and there were no complications. Bleeding equaled to 150ml.

Measurements and Main Results: Visually, all affected organs were free of lesions. The patient reported disappearance of previous symptoms at the immediate postoperative. She was discharged on the 4th postoperative day and returned to work on the 10th postoperative day.

Conclusion: Through laparoscopic technique and a team of experienced and highly trained surgeons it was possible to perform the surgical treatment of endometriosis infiltrating multiple organs in the upper abdomen and chest. There were neither intra nor immediate postoperative complications.

Open Communications 10: Endometriosis (3:00 PM — 4:00 PM)

Inguinal Canal Endometriosis: A Laparoscopic Approach
Pereira R.M.A., Pereira M.A., Jr. Lima R.F., Mandarino T., Fonseca de Oliveira J., Carvalho L.P., Camargo S.F., MIGS, Center of Endometriosis and MIGS - Santa Joana Hospital and Maternity, Sao Paulo, Brazil; Center of Endometriosis and MIGS - Santa Joana Hospital and Maternity, Sao Paulo, Brazil; Center of Endometriosis and MIGS - Londrina-Pr, Londrina, Brazil; Center of Endometriosis and MIGS - Santa Joana Hospital and Maternity, Sao Paulo, Brazil.

Study Objective: The purpose of this video is to demonstrate the viability of the laparoscopic approach for excision of endometriosis in the inguinal canal and the individualization of the anatomical structures in this region.

Design: The procedures aimed at treating symptomatic patients with cyclic groin pain, secondary to endometriosis infiltrating the inguinal canal, during a laparoscopic approach for deep endometriosis affecting the pelvis or other regions of the abdomen. All patients had a preoperative diagnosis through imaging (MRI and Ultrasound).

Setting: A 3D camera with 30˚ optics was used to provide an enlarged and suitable viewing angle of the anterior abdominal wall.

Patients or Participants: Between July 2019 and February 2020, 5 patients had a preoperative diagnosis (MRI and Ultrasound) and underwent a laparoscopic resection of endometriosis infiltrating the inguinal canal. 35 patients with endometriosis affecting only the internal inguinal ring were excluded.

Interventions: The first step was to open the peritoneum covering the internal inguinal ring, followed by the identification of the lesion inside the canal. External iliac vessels were identified and, if necessary, a double vascular bulldog interrupted venous or arterial circulation during the dissection of the vessel.

Measurements and Main Results: After three months all patients underwent a clinical MRI examination. They were asymptomatic and no residual lesions were identified.

Conclusion: A laparoscopic approach can be performed effectively and safely for the excision of endometriosis in the inguinal canal.

Open Communications 11: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

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Study Objective: To identify patient and hospital characteristics associated with minimally invasive (MIS) hysterectomy.

Design: Retrospective population-based analysis of administrative data.

Setting: Data from the Illinois Hospital Association Comparative Health Care and Hospital Data Reporting Services Database.

Patients or Participants: Women undergoing hysterectomy for benign gynecologic indications in Illinois, 2016-2018.

Interventions: None.

Measurements and Main Results: We determined the significance of the proportion of MIS versus abdominal hysterectomies by patient and hospital characteristics. Multivariable logistic regression was used to determine the association between patient and hospital characteristics and the likelihood of MIS versus abdominal hysterectomy controlling for the simultaneous effects of all patient and hospital characteristics and year of surgery. There were 42,945 hysterectomies for benign indications at 143 non-federal Illinois hospitals from 2016-2018. Over three quarters (32,387, 75.4%) of hysterectomies were MIS. Non-Hispanic Black patients had the lowest percentage of MIS (54.7%) compared to 82.1% among Whites (p <0.001). Being non-Hispanic Black (OR=0.53, 95% CI 0.47-0.60), Other/unknown race and ethnicity (OR=0.76, 95% CI 0.52-0.85), or having a diagnosis of fibroids (OR=0.54, 95% CI 0.49-0.60) were associated with lower likelihood of MIS. Patients treated at hospitals with >80% MIS, had almost six times the likelihood of MIS (OR=5.89, 95% CI 4.51-7.68).

Conclusion: Black race and a fibroid diagnosis are independently associated with decreased odds of undergoing MIS hysterectomy, while the strongest predictor of undergoing MIS hysterectomy was hospital proportion of minimally invasive procedures.

Open Communications 11: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

3:06 PM


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Study Objective: Obstetrics and gynecology (OBGYN) residents are required to pass a Fundamentals of Laparoscopic Surgery (FLS) exam to qualify for written boards. FLS exam validity evidence has been questioned recently and concerns have been raised with its applicability to gynecologic surgical training. We present preliminary data from a pilot study which aims to correlate performance on FLS manual skills to a vaginal cuff closure model in a simulated setting.

Design: Prospective descriptive study

Setting: OBGYN residency program at a large urban academic medical center.

Patients or Participants: OBGYN residents in post-graduate year three.

Interventions: In addition to the standard five FLS tasks, participants are introduced to a previously studied vaginal cuff closure model during a teaching session. Before taking FLS exam, they are evaluated on a cuff closure using the modified Global Operative Assessment of Laparoscopic Skills (GOALS) and a task-specific checklist. After assessment, residents filled out a usability survey.

Measurements and Main Results: Seven residents participated between July and December 2019. The mean time to completion of the cuff closure was 14.6 minutes (SD= 2.2 minutes) and range of 12.5 to 18.5 minutes. In our sample size of 7, we did not detect a correlation between official composite FLS and vaginal cuff scores as measured with GOALS (rho = 0.1070, p = 0.819) or the checklist (rho = 0.359, p = 0.429). All residents found the cuff to be a useful addition to curriculum and preferred to replace an FLS task with the cuff model. We plan to continue enrollment of 11 residents per year for four years, to reach a sample size of 44.

Conclusion: In this preliminary analysis of a pilot study, we did not find a correlation between performance on a vaginal cuff task trainer and FLS manual skills. Residents preferred cuff closure to FLS tasks.

Open Communications 11: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

3:12 PM

Twitter for the Gynecologist

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Study Objective: The objectives of this video are to: 1) review the importance of Twitter for gynecologists, 2) demonstrate how to create a Twitter account, and 3) describe how to effectively utilize the Twitter platform professionally.

Design: This is an educational video. Institutional review board approval was not required for this video article as the video describes the impact and use of Twitter and does not describe a clinical case. Animations were created by the authors.

Setting: Twitter as a social media platform.

Patients or Participants: Gynecologists.

Interventions: Through the use of animation and examples, the video describes how to use Twitter to: 1) be a voice for the medical community, 2) educate and inform patients and other medical professionals, 3) network and collaborate with colleagues and experts in the field, 4) stay up to date on clinical information remotely, and 5) market and brand oneself as a gynecologist.

Measurements and Main Results: The video can serve as a resource for gynecologists to learn how to create a twitter account and understand how to leverage Twitter for professional use.

Conclusion: The use of social media is growing, and social media platforms such as Twitter are being utilized ubiquitously in the medical field by patients, healthcare professionals, organizations, and journals to share information and increase visibility. It is imperative as a gynecologist to learn how to utilize Twitter professionally in order to be a voice for the medical community and disseminate evidence-based information.

Open Communications 11: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

3:18 PM

Utility of Routine Preoperative Laboratory Testing for Low-Risk Patients in Ambulatory Gynecologic Surgery

Mutter O.,* Taylor G.A., Grebenyuk E., Kuo L.E., Sanserino K., Obstetrics, Gynecology, and Reproductive Sciences, Temple University Hospital, Philadelphia, PA; General Surgery, Temple University Hospital, Philadelphia, PA; Lewis Katz; School of Medicine at Temple University, Philadelphia, PA; General Surgery, Lewis Katz; School of Medicine at Temple University, Philadelphia, PA; Department of
Measurements and Main Results: Of 19,885 patients studied, 14,258 (71.8%) received preoperative laboratory testing, with at least one abnormal test identified in 4,053 (28.4%) patients. There was no statistically significant difference in overall postoperative complication rate when comparing patients who received preoperative laboratory testing with those who did not (2.5% vs. 2.2%, p=0.30). Additionally, there was no statistically significant difference in wound complications (1.0% vs. 1.0% p=0.78), major complications (1.0% vs. 0.8% p=0.11), unplanned return to the operating room (0.1% vs. 0.2%, p=0.40), unplanned readmission (0.7% vs. 0.5% p=0.10), or overall morbidity (2.1% vs. 1.9% p=0.38). Chi-squared analyses were performed to compare categorical variables. Continuous variables were compared using unpaired t-tests.

Conclusion: Preoperative laboratory testing continues to be performed in the majority of low-risk patients undergoing ambulatory gynecologic surgery despite evidence and guidelines that do not recommend this practice. However, there was no difference in surgical outcomes between patients who did and did not receive preoperative laboratory testing. Postoperative complications are infrequent in this patient population. These results suggest that preoperative laboratory testing should be used more judiciously in low-risk patients undergoing ambulatory gynecologic surgery.
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*Corresponding author.

**Study Objective:** To identify patient, surgeon and hospital characteristics that predict same-day discharge after minimally invasive hysterectomy (MIH)

**Design:** Cross-sectional

**Setting:** Five-hospital healthcare system

**Patients or Participants:** Women undergoing benign laparoscopic or robotic-assisted hysterectomy from 7/1/2014 to 2/28/2019.

**Interventions:** NA

**Measurements and Main Results:** Independent variables included patient characteristics (age, BMI, comorbidities, race, insurance, uterine size on pre-operative imaging, indication for surgery, distance from hospital), surgical characteristics (route of surgery, concomitant procedures, EBL, duration in OR, start time of case), and surgeon/hospital characteristics (academic vs. community, surgeon specialty, surgeon volume, resident participation). Multivariate logistic regression was used to assess the odds of same-day discharge (POD#0).

Among 2,081 MIHs performed, 610 (29.3%) were discharged on POD#0. Same-day discharge increased from 22.7% in 2015 to 37.3% in 2019 (p<0.001). Discharge on POD#0 was more likely with the following factors: MISG-trained surgeon (OR 10.7 [95%CI 3.0-38.7]), resident participation (OR 2.2 [1.2-4.2]), shorter case duration (<100 min, all discharged home on POD#0; 100-150 min; OR 2.6 [1.3-5.6]), and high-volume surgeon (4-8 or more hysterectomies/month, OR 4.4-81.4 [2.5-1713.6]). Discharge on POD#0 was less likely with the following factors: ≥4 comorbidities (OR 0.10 [0.02-0.45]), low-volume surgeon (<0.5 hysterectomies/month, OR 0.01 [0.00-0.26]), higher EBL (100-250cc, OR 0.54 [0.32-0.98]; 250-500cc, OR 0.29 [0.14-0.59]; >500cc, OR 0.07 [0.02-0.25]), start time after 4pm (OR 0.05 [0.00-0.62]), longer case duration (200-250 min, OR 0.56 [0.37-0.92]; >250 min, OR 0.54 [0.30-0.97]), and living >100 miles from the hospital (OR 0.23 [0.06-0.81]).

**Conclusion:** Patient, surgical, and surgeon factors all influence the timing of post-operative discharge. If teams are interested in increasing same-day discharge after MIH, scheduling ideal candidates (based on predictive factors above) earlier in the day could help achieve this goal. Lastly, if a patient is interested in same-day discharge, referral to a high-volume and/or MISG-trained surgeon could be considered.

Open Communications 12: Combined Learning (3:00 PM — 4:00 PM)

**3:00 PM**

**Three-Year Results of the Sonata Pivotal Trial of Transcervical Fibroid Ablation (TFA) for Symptomatic Uterine Myomata**

*Corresponding author.

**Study Objective:** To report 3-year clinical outcomes of the SONATA pivotal trial of transcervical fibroid ablation (TFA) in women with symptomatic uterine myomata.

**Design:** Prospective, controlled, multicenter interventional trial.

**Setting:** 22 clinical sites (21 in the US and 1 in Mexico)

**Patients or Participants:** 147 premenopausal women with symptomatic uterine fibroids who underwent a uterus-preserving, sonography-guided TFA procedure with the Sonata® System.

**Interventions:** TFA was performed on up to 10 clinically relevant uterine fibroids, each ranging from 1 to 5 cm in diameter. Patients were treated on an outpatient basis and returned for regular follow-up visits over 2 years. Assessed outcomes included changes in symptom severity, health-related quality of life, general health status, work and activity limitations, treatment satisfaction, adverse events, surgical reintervention, and occurrence of pregnancy and associated outcomes.

**Measurements and Main Results:** The 3-year rate of surgical reintervention for heavy menstrual bleeding calculated by the binomial and Kaplan-Meier methods was 9.2% and 8.2% respectively. Compared to baseline, mean SSS decreased from 55±19 to 22±21, HRQL increased from 40±21 to 83±23, and EQ-5D increased from 0.72±0.21 to 0.88±0.16 (all p<0.001). Treatment benefit on the SSS, HRQL, and EQ-5D exceeded the minimal clinically important difference at every follow-up visit over 3 years. At 3 years, 94% reported treatment satisfaction, 88% reported improved fibroid symptoms, work absenteeism due to fibroid symptoms decreased from 2.9% to 1.4%, and impairment due to fibroids decreased from 51% to 12% for work, and 58% to 14% for physical activity (all p<0.001). No late complications occurred.

**Conclusion:** Women treated with sonography-guided TFA in the SONATA pivotal trial experienced significant and durable improvement in fibroid-related symptoms with low surgical reintervention rates over 3 years of follow-up.
Study Objective: To evaluate the clinical response of elagolix-treated women with heavy menstrual bleeding (HMB; >80mL menstrual blood loss [MBL]/cycle) and uterine fibroids (UF) who were considered “non-responders” for not meeting the primary endpoint in Elaris UF-1 or UF-2 phase 3 trials, yet may have had a clinically meaningful reduction in MBL. Design: Pooled analysis of UF-1 and UF-2 Setting: Replicate randomized placebo-controlled trials Patients or Participants: “Non-responders” were defined as women who did not simultaneously meet both primary endpoint bleeding criteria (<80mL MBL during final month [FM] and ≥50% MBL reduction from baseline to final month [BTFM]). Women were also considered “non-responders” if they prematurely discontinued treatment due to adverse events (AEs), lack of efficacy, or required surgical/invasive fibroid treatment even if they simultaneously met both primary endpoint bleeding criteria. Interventions: Elagolix 300mg BD+add-back therapy (estradiol 1mg/norethindrone acetate 0.5mg QD) (elagolix+E2/NETA) Measurements and Main Results: Of the 367 elagolix+E2/NETA-treated women with observed data, 278 (76%) met the “responder” criteria and 89 they simultaneously met both primary endpoint bleeding criteria. Accuracies of Preoperative Ultrasound in Predicting Uterine Weight across Varying Uterine Pathologies Hattiangodi R.V., 1, 5, 6 Dahlan M., 1, 5 Sydlo D.W., 5, 6 Gynecology, Virginia Mason Medical Center, Seattle, WA; 5, 6 Statistical Center for HIV/AIDS Research and Prevention, Fred Hutchinson Cancer Research Center, Seattle, WA

Study Objective: The purpose of this study is to evaluate the accuracy of preoperative ultrasound in predicting the weight of a non-gravid uterus at the time of hysterectomy. Additionally, we examine the effect of varying uterine pathologies on the accuracy of these predictions. Design: We performed a retrospective review of 386 patients who underwent hysterectomy for benign indications in 2018 at a center for minimally invasive gynecologic surgery. Setting: N/A Patients or Participants: 318 patients were selected who had a preoperative ultrasound with reported estimated uterine volumes.

Interventions: N/A Measurements and Main Results: We compared estimated uterine volumes (EUV) to actual uterine weights (AUW), as described in pathology reports. A Bland-Altman plot was devised to determine intermethod agreement with 95% limits of agreement. Simple linear regression analysis was used to correlate EUV with AUW. Multivariable linear regression was performed, allowing for subgrouping by uterine pathology, as identified on preoperative ultrasound. While EUV and AUW were significantly correlated (r=0.93, p<0.01), implying an association between the two measurements, the degree of agreement between paired measurements was wide. The Bland-Altman plot identified that AUW ranged from 0.51 to 1.99 times the magnitude predicted by preoperative ultrasound. These wide deviations in intermethod agreement were consistent amongst the various uterine pathologies. Multivariable linear regression analysis demonstrated the difference in EUV and AUW was 2 – 3.5 times larger for patients with endometrial polyps, adenomyosis and uterine fibroids as compared to normal uteri.
Conclusion: Our study shows that in 95% of cases, AUW following hysterectomy ranged from half to twice as large as estimated by preoperative ultrasound. Uterine pathology had a significant impact on the reliability and usefulness of preoperative ultrasound for estimation of uterine volume. In gynecologic practices where route of hysterectomy is influenced by preoperative estimations of uterine weight, uterine volume as measured by ultrasound should not be considered very reliable.

Open Communications 12: Combined Learning
(3:00 PM — 4:00 PM)

3:30 PM

Successful Symptomatic Relief of a Patient with Recurrent Fibroids, Undergoing Laparoscopic Radiofrequency Fibroid Ablation
Hawkins S.M.,* Davis A.N. Gynecology, Fibroid and Pelvic Wellness Center of Georgia, Alpharetta, GA
*Corresponding author.

Study Objective: To document, through a case report video, a successful Laparoscopic Radiofrequency Ablation (Lap RFA) treatment for multiple recurrent fibroids after myomectomy.

Design: Video Case Report, 7 month follow up.

Setting: Hospital OR, Straight Stick Laparoscopy with Laparoscopic Ultrasound and Guidance Mapping.

Patients or Participants: 36-year-old African American, G0 with history of open myomectomy in 2010, presented with 2-year history of urinary frequency, urgency, constipation, back pain and heavy menstrual bleeding. Ultrasound imaging showed multiple fibroids including: 4.6 cm type 5, 5.4 cm type 2, 2.4 cm type 2, 3.0 cm type 2, and 2.1 cm type 2. The patient was seeking a uterine sparing alternative to a repeat myomectomy.

Interventions: Hysteroscopy, D&C, and Laparoscopic Radiofrequency Ablation, July 2019, with six fibroids treated, and 13 minutes of total ablation time. EBL 15cc. No surgical or postoperative complications.

Measurements and Main Results: 6 week post op visit: patient reports soreness, that her pelvis subjectively feels lighter, and spotting/discharge for 2 weeks that resolved by 1 month.

3 month follow up: ultrasound shows a 7.3 x 7.2 cm vs previous 9 x 9 cm uterus, multiple fibroids, 3.9 cm (from 5.4 cm), 2.2 cm (from 3.0 cm) and 3.9 cm (from 4.6 cm) in their largest dimensions.

6 month follow up: ultrasound shows a 9 x 6 x 5 cm uterus and persistence in fibroid sizes.

7 month follow up: patient notes subjective improvement in urinary frequency, urgency, constipation, back pain and heavy menstrual bleeding.

Conclusion: Laparoscopic radiofrequency ablation resulted in decreased uterine and fibroid size and provided symptomatic relief in this patient and should be considered as a safe, minimally invasive alternative to repeat myomectomy in patients desiring uterine sparing treatment for recurrent fibroids and for those with complex, multi-fibroid uterine anatomy.

Open Communications 12: Combined Learning
(3:00 PM — 4:00 PM)

3:42 PM

The Prevalence of Hyperglycemia and the Impact on Perioperative Outcomes in Gynecologic Surgery
Chaves K.F.,1, 2 * Panza J.,1, 2 Apple A.,1, 2 Olorunfemi M.,1, 2 Helou C.M.,1 Sorabella L.,1 Dunas S.,2 Adam R.,2 Prescott L.,2 1Division of Minimally Invasive Gynecologic Surgery, Vanderbilt University Medical Center, Nashville, TN; 2Obstetrics & Gynecology, Vanderbilt University Medical Center, Nashville, TN; *Corresponding author.

Patients or Participants: Patients (n=913) undergoing major gynecologic surgery on an enhanced recovery pathway from January 2018 through July 2019.

Interventions: Major gynecologic surgery on an enhanced recovery pathway.

Measurements and Main Results: The prevalence of hyperglycemia (blood glucose ≥140 g/dL) amongst all patients was 7.3%. After adjusting for key clinical and demographic factors, diabetes (aOR 27.2; 95% CI 14.8-50.2) and malignancy (aOR 2.5; 95% CI 1.3-6.6) were associated with increased odds of hyperglycemia. Hyperglycemia was associated with increased odds of composite perioperative complication (aOR 1.9; 95% CI 1.0-3.7). There was no association between blood glucose level and wound complications. Fifty percent of non-diabetic patients met the United States Preventive Services Task Force criteria for diabetes screening, however only 30% of this group had documented diabetes screening in the three years preceding surgery.

Conclusion: While the prevalence of hyperglycemia in the gynecologic surgery population is low, preoperative hyperglycemia is associated with increased odds of perioperative complication. Additionally, compliance with diabetes screening for at-risk patients is suboptimal. Identifying and managing hyperglycemia in the preoperative period may mitigate surgical risk. Moreover, the preoperative time period provides an opportunity to ensure current diabetes screening in at-risk patients.

Open Communications 12: Combined Learning
(3:00 PM — 4:00 PM)

3:36 PM

Learning Curves and Influencing Factors of Laparoscopic Single-Site Myomectomy (LESS-M)
Li J.,* Qu X., Chen Y., Hua K. Obstetrics and Gynecology Hospital of Fudan University, Shanghai, China
*Corresponding author.

Study Objective: The objective of this study was to analyze the learning curves of laparoscopic single-site myomectomy (LESS-M) and to explore the influencing factors of operative time.

Design: Retrospective observational study.

**Tuesday, November 10, 2020**

**Open Communications 13: Combined Learning**

**(3:00 PM — 4:00 PM)**

**Cost and Diagnosis Patterns for Women with Postmenopausal Bleeding**

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*Corresponding author.

**Study Objective:** To describe common diagnosis patterns and associated cost burden for women undergoing endometrial biopsy (EMB) after being diagnosed with postmenopausal bleeding (PMB).

**Design:** US retrospective claims analysis. Healthcare resource utilization and costs were estimated on a per patient per year (PPPY) basis.

**Setting:** N/A

**Patients or Participants:** Women undergoing EMB following diagnosis of PMB between 1/1/2012 and 7/31/2019 in the 10 million person IBM MarketScan Commercial Database.

**Interventions:** N/A

**Measurements and Main Results:** 59,616 women (mean age 57 years) with PMB were identified. Of these, 26,229 (44%) had evidence of an EMB and 10,653 (41%) with 2-year continuous insurance enrolment following the EMB formed the target analysis group. 11% (1,149/10,653) received a second EMB within 2 years of their initial biopsy; 2% (238/10,653) underwent a second EMB within 90 days of the initial biopsy. Among women with one EMB, 6% were diagnosed with endometrial hyperplasia and 3% were diagnosed with endometrial cancer within 90 days of biopsy. Among women with two biopsies, 16% were diagnosed with hyperplasia and 2% with cancer. Women with repeat biopsies had more physician visits (6.95 vs 6.08) and significantly higher average PPPY cost compared to women with only a single biopsy over a year ($21,211 vs 14,795, p<0.001). On average, patients incurred $532 in healthcare costs on the day of repeat biopsy. The most common additional services billed on the day of repeat biopsy were pathology (87%), office visits (50%) and ultrasound (22%).

**Conclusion:** Approximately 11% of women receive more than one EMB within two years following a diagnosis of PMB, resulting in substantial healthcare utilization. 2% undergo a second EMB within 90 days of the first and a substantially greater number of patients have hyperplasia/carcinoma on the second EMB, suggesting that the first EMB is adequate and there is clinically significant discrepancy between the two EMBs.

**Open Communications 13: Combined Learning**

**(3:00 PM — 4:00 PM 3:06 PM)**

**Evaluation of Blood Perfusion in the Myometrium of Women with Symmetric Uterine Anomalies Using Dynamic Contrast-Enhanced MRI.**

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*Corresponding author.

**Study Objective:** The objective of our study is to evaluate functional/dynamic enhanced MRI evaluation of the vascular (capillary) circulation of the myometrium and intrauterine septum in patients with symmetric uterine anomalies.

**Design:** Prospective cohort study, Level II.

**Setting:** National Medical Research Center for Obstetrics, Gynecology and Perinatology, Moscow, Russia.

**Patients or Participants:** 247 patients of patients with symmetric uterine anomalies were evaluated and treated between 2015 and 2020 at the department of operative gynecology.

**Interventions:** Surgical correction of genital malformations was performed in accordance with clinical manifestations: miscarriage or infertility. The new method of functional/dynamic contrast enhanced (DCE) MRI was employed in order to estimate uterine blood perfusion in symmetric uterine malformations. Dynamic monitoring of serial images evaluated the blood supply in the myometrium and septum by digital diagram and color-mapping.

**Measurements and Main Results:** The functional MRI was performed in 72 patients requiring surgery, and 30 patients managed without surgical correction. Microcirculation was reduced by over 32 % in most (87%) patients with sub-septate uterus, and in 46% of patients with complete uterine septum, increasing the need for hysteroscopic metaplasty in these patients. Histopathologic evaluation of the resected septi identified the presence of significant uterine dysmorphogenesis, vascular malformations, and deep myometrial fibrosis. The asymmetric perfusion of the duplicate uterus was detected in 85% of patients, because the myometrial blood perfusion was reduced much more 22% in hemi-uteri. Successful pregnancy progressed in hemi-uteri with better perfusion results (p<0.001), indicating a potential need in IVF for embryo transfer to the cavity with more optimal blood supply.

**Conclusion:** Functional/dynamic-enhanced MRI identifies the degree of blood perfusion in the myometrium and intrauterine septum of women with symmetric uterine anomalies and may assist in development of surgical and assisted reproductive strategies in the management of these patients.

**Open Communications 13: Combined Learning**

**(3:00 PM — 4:00 PM 3:12 PM)**

**Access to Minimally Invasive Gynecologic Surgery for Adnexal Surgery: Impact of Race and Payer Mix**

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**Study Objective:** To determine racial and social disparities regarding adnexal surgery.

**Design:** Retrospective cohort.

**Setting:** Data was obtained from the Statewide Planning and Research Cooperative System (SPARCS) for New York State. The database was reviewed from 2011 - 2015 for ovarian cystectomy with or without salpingectomy for benign indications.

**Patients or Participants:** There were 68,029 patients included in this analysis. Average age was 43 years, with 81.3% between 18-55 and 17.7% older than 55. Racial composition comprised of 68.7% Caucasian, 4.8% Asian, 11.2% Black, and 15.3% as other. Payor mix included 79.6% insured, 7.4% Medicaid, 8.3% Medicare, and 4.7% other or self-payment. Majority resided in metropolitan areas (90.6%) and did not travel greater than 15 miles for care.

**Interventions:** Adnexal surgery performed via laparotomy or laparoscopy.

**Measurements and Main Results:** Of the 68,029 patients included, 54,829 were performed via laparoscopy (80.6%) while 13,200 were via laparotomy (19.4%). Compared to Caucasian, odds ratio of having a laparoscopy was 0.68 for Black, 0.81 for Hispanic, and 0.80 for other. Compared to commercial insurance, odds ratio of having a laparoscopy was 0.69 for Medicaid, 0.72 for Medicare, 0.92 self. At high-
volume surgical facilities, the odds ratio for utilizing laparoscopy was 1.83 compared to low volume facilities and 1.49 compared to medium volume facilities. At institutions with major teaching affiliation, the odds ratio was 0.91 compared to non-teaching and 1.0 for minor affiliation.

Conclusion: Race is not the only factor associated with a lower likelihood of laparoscopy for adnexal surgery. Other factors such as institution type and payer mix also impact likelihood.

Open Communications 13: Combined Learning
(3:00 PM — 4:00 PM)
3:18 PM

Cost-Effectiveness of Preoperative Type and Screen in Patients Undergoing Laparoscopic Hysterectomy
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Study Objective: To evaluate if routine preoperative type and screen (T&S) is cost-effective and clinically warranted in patients undergoing laparoscopic hysterectomy.

Design: Retrospective case-control study conducted between 01/01/2001 and 09/01/2019.

Setting: Large tertiary care center and its associated community referral hospital.

Patients or Participants: All patients who underwent laparoscopic hysterectomy for benign and malignant indications were included.

Interventions: N/A

Measurements and Main Results: Medical records were reviewed using a centralized clinical data registry. Cases were defined as patients who received a perioperative red blood cell transfusion (72 hours before or after surgery). Differences between groups were analyzed using an independent samples t-test for means, Wilcoxon rank sum test for medians, and chi-square for categorical variables. Among 8,321 patients who underwent laparoscopic hysterectomy, 61 (0.73%) had a perioperative transfusion. Age and smoking status were similar between groups; however, cases were more likely to be African-American, Asian and have a body mass index greater than 30 (p<0.05). Of those who received a transfusion, 23 (37.1%) were performed intraoperatively (7 for preoperative anemia, 13 for large intraoperative blood loss, 2 for vascular injury and 1 for unknown reasons). Conversion to open laparotomy occurred in 27 cases, of which 5 underwent transfusion. Only 4 transfusions (0.05% of hysterectomies) were performed urgently where waiting for T&S and crossmatching would not have been feasible and un-crossmatched O-negative blood would have been required. Eliminating T&S in this population is estimated to save at minimum $624,075 to $832,100 during the study period.

Conclusion: Routine T&S is not cost-effective nor clinically useful for the majority of patients undergoing laparoscopic hysterectomy. Our findings parallel other published research on minimally invasive hysterectomies. Further analysis might identify a subset of patients who are at higher risk of blood loss and would benefit from a preoperative T&S.

Open Communications 13: Combined Learning
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3:24 PM

Fine Motor Skills Task Experience and Laparoscopic Vaginal Cuff Suturing Performance after Training with Two Laparoscopic Simulators
Lin E.,1 Runge M.,1 Auby D.,1 Traylor J.,3 Nixon K.E.,1 Chaudhari A.,1 Tsai S.C.,1 Trinkus V.P.,2 DeStephano C.C.,1 Milad M.P.1 1Department of Obstetrics and Gynecology, Division of Minimally Invasive Gynecologic Surgery, Northwestern University Feinberg School of Medicine, Chicago, IL; 2Department of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL; 3Department of Obstetrics and Gynecology, Division of Minimally Invasive Gynecologic Surgery, Northwestern Medicine, Silver Spring, MD, United States; 4Minimally Invasive Gynecology Surgery, Mayo Clinic College of Medicine and Science, Jacksonville, FL *Corresponding author.

Study Objective: To determine if prior video gaming or fine motor skills task experience was associated with improved performance on a vaginal cuff suturing task following training with two laparoscopic simulators.

Design: Randomized controlled trial incorporating block randomization and a masked design.

Setting: Participants were trained and tested during a four-hour session in the Northwestern Center for Advanced Surgical Education simulation lab.

Patients or Participants: 45 surgically naïve premedical and preclinical medical students were recruited from June-November 2019.

Interventions: Participants were randomized into two laparoscopic simulator groups – Essentials in Minimally Invasive Gynecology or Fundamentals of Laparoscopic Surgery – then underwent training on relevant simulation tasks for 2.5 hours.

Measurements and Main Results: Demographic information was collected for all participants, including fine motor skills task and video gaming experience. Participants completed a video-recorded pre-test and post-test on a laparoscopic vaginal cuff suturing model. Videos were masked then graded using a modified version of the Global Operative Assessment of Laparoscopic Skills (GOALS) tool by high-volume minimally invasive gynecologic surgeons. Two sample t-tests with unequal variances were employed to compare GOALS scores. Significant differences were noted in baseline pre-test composite GOALS scores for participants with prior experience playing instruments (diff=2.7, p=0.007), sewing (diff=2.3, p=0.03) and completing artistic tasks (diff=3.05, p=0.01). However, the mean difference between post- and pre-test composite GOALS scores was not different for participants with prior video gaming or fine motor skills task experience.

Conclusion: Participants with prior fine motor skills task experience performed better at baseline on the pre-test vaginal cuff model. However, after training, these same participants did not perform better when compared to those without prior fine motor task skill experience, regardless of simulation group. These results suggest that prior fine motor skills task experience may not predispose surgically naïve learners to improved performance with certain laparoscopic simulation tasks.

Open Communications 13: Combined Learning
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3:30 PM

Impact of a Trauma Center and Surgical Priority Classification System on Gynecologic Emergency Surgery (GynES) Quality Measures
Kahan A.N.,3 Cockrum R.H., Douglass L., Snow S. University of Chicago Medicine, Chicago, IL *Corresponding author.

Study Objective: We evaluated the impact of opening a Level I Trauma Center on quality measures in GynES. The primary outcome was the time elapsed between case request and patient arrival to the operating room (R: R time).

Design: This retrospective cohort study compared cases in 2017 (pre-intervention) to 2019 (post-intervention) in a convenience sample.

Setting: Urban academic tertiary-care hospital, single institution.

Patients or Participants: Women were included (n=228) if they presented to the Emergency Department and underwent GynES for one of the three indications: ectopic pregnancy, miscarriage, or adnexal torsion.
Interventions: The intervention period in 2018 included modernizing the Emergency Department, instituting a surgical priority classification system (R:R time targets: A < 30 minutes, B < 2 hours, C < 4 hours, D < 12 hours), and optimizing perioperative services for a new Level I Trauma Center.

Measurements and Main Results: Two reviewers assigned priority class retrospectively for pre-intervention cases (Kappa=0.60). A third reviewer adjudicated discrepancies. R:R time was assessed by difference of means [95% CI] and percent compliant with targets using Welch’s T-Test and Fisher’s Exact Test (alpha=0.05), respectively. Interrupted time series logistic regression evaluated for secular trends. When compared to 2017 (n=111), R:R time in 2019 (n=117) was significantly reduced for class A cases (-42min [-67 to -17min], p=0.02) and class B cases (-59min [-99 to -20min], p=0.004). Overall compliance significantly improved from 50% to 71%, p=0.002. Logistic regression did not find confounding from pre-intervention trends. Patient and case characteristics were similar except for insurance mix, p=0.04.

Conclusion: Implementation of a Level I Trauma Center and surgical priority classification system significantly reduced delays for the most urgent gynecologic emergency surgeries.

Open Communications 13: Combined Learning (3:00 PM — 4:00 PM)

3:36 PM

The Use and Cost-Effectiveness of Routine Preoperative Blood Typing and Antibody Screening in Hysterectomy for Benign Indications
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Study Objective: The purpose of this study is to quantify preoperative blood typing and antibody screening (T&S), as well as blood transfusion rates for benign hysterectomies. We also aim to validate and adopt a model by Stanhiser et al. (2017) that predicts transfusion risk in gynecologic surgery. Lastly, we aim to assess the potential cost savings by decreasing T&S testing through application of this model.

Design: A retrospective cohort study utilizing the de-identified electronic medical record available at Vanderbilt University Medical Center’s Synthetic Derivative Database.

Setting: Risk of transfusion in hysterectomy patients is low (0.3-11%), however T&S is often ordered routinely preoperatively. Identification of patient characteristics associated with risk of transfusion in gynecologic surgery enabled the development of transfusion risk prediction models. These models may help inform value-driven preoperative laboratory testing.

Patients or Participants: 5617 patients undergoing hysterectomies (vaginal, laparoscopic, robotic-assisted, or by laparotomy) for benign indications from 2000-2016 at a large academic, tertiary care medical center.

Interventions: N/A

Measurements and Main Results: A total of 5617 hysterectomies were identified, of which 1478 were performed by laparotomy. The blood transfusion rate was 4.7% (95% confidence interval [CI], 4.2-5.3%). Preoperative T&S was obtained for 53.4% (95% CI, 52.1-54.7%) of patients. Preliminary univariate validation confirmed that transfusion was positively associated with planned laparotomy, history of hypertension, and low hemoglobin (all P < 0.001), and, contrary to the Stanhiser model, also with a history of fibroids (P < 0.037). Significant non-linear associations of parity and body mass index were similar to the Stanhiser model.

Conclusion: Preoperative T&S testing occurred in more than half of benign hysterectomy patients, while the blood transfusion rate was 4.7%. There is potential for cost savings by decreasing the use of routine testing by adopting a validated transfusion risk prediction model. Future directions include continued model validation and cost calculations.

Open Communications 13: Combined Learning (3:00 PM — 4:00 PM)

3:42 PM

Comparison of Clinical Characteristics and Sonographic Findings of Adnexal Torsion between Pregnancy Trimesters.
Meller N., 1, 2 Levin G., 1, 3 Mashiach R., 1, 3 Mohr-Sasson A., 1, 3 Cohen S., 1, 4 Korinem D., 1, 3 Cohen A., 1, 3 Abu-Bandora E., 5 Meyer R., 1, 3 Obstetrics and Gynecology, Sheba Medical Center, Ramat-Gan, Israel; 3Obstetrics and Gynecology, Hadassah Medical Center, Nachla, Israel; 5Department of Obstetrics and Gynecology, Sheba Medical Center, Tel-Hashomer, Ramat-Gan, Israel; 4Hadassah Medical Center, Jerusalem, Israel; 3Tel-Aviv University, Tel-Aviv, Israel *Corresponding author.

Study Objective: To compare the clinical characteristics and sonographic findings of adnexal torsion between pregnancy trimesters.

Design: A retrospective cohort study between 2011 and 2020.

Setting: A tertiary, university affiliated medical center.

Patients or Participants: Overall, 122 pregnant women with 131 separate episodes of surgically proven adnexal torsion.

Interventions: Laparoscopy for confirmation and treatment of adnexal torsion.

Measurements and Main Results: We collected demographic and clinical characteristics as well as sonographic findings and laboratory results of all adnexal torsion episodes. We compared the three trimesters of pregnancy. Overall, 92 of the episodes occurred during 1st trimester, 29 and 10 occurred during 2nd and 3rd trimester, respectively. The majority of cases were right sided (61%). Pregnancy achieved following assisted reproductive technology (ART) was more common in the 1st trimester group (p<0.001). Visual analogue scale score of >6 was more common in 1st and 3rd trimester, compared to 2nd trimester (p=0.02). Gastrointestinal symptoms were also more common among patients in the 1st trimester (p<0.007).

The mean diameter of affected adnexa was similar in all trimesters, while the non-affected adnexa was marginally significantly smaller in the 2nd and 3rd trimesters. In approximately one third of all cases ultrasound findings included at least one specific feature: edematous ovary, absent doppler flow or presence of whirlpool sign. Absent doppler flow was more common in the 2nd and 3rd trimester compared to the 1st trimester (p<0.03), and the presence of ovarian teratoma was more common in the 2nd and 3rd trimesters, compared to the 1st (p=0.05).

Duration from admission to surgery was significantly longer in the 2nd and 3rd trimester compared to the 1st trimester (p<0.007). The mean diameter of affected adnexa was similar in all trimesters, while the non-affected adnexa was marginally significantly smaller in the 2nd and 3rd trimesters. In approximately one third of all cases ultrasound findings included at least one specific feature: edematous ovary, absent doppler flow or presence of whirlpool sign. Absent doppler flow was more common in the 2nd and 3rd trimester compared to the 1st trimester (p<0.03), and the presence of ovarian teratoma was more common in the 2nd and 3rd trimesters, compared to the 1st (p=0.05).

Conclusion: We found differences in the clinical, sonographic and laboratory manifestations of adnexal torsion in each trimester of pregnancy. When assessing pregnant patients with suspected adnexal torsion, these differences may assist in ameliorating an accurate diagnosis.
Obliterated Cul-De-Sac in Endometriosis: Retrograde Dissection of Rectum

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Study Objective: To demonstrate a retrograde dissection technique for safe management of the obliterated cul-de-sac during hysterectomy in stage IV endometriosis.

Design: A case report.

Setting: Academic tertiary care hospital.

Patients or Participants: 50-year-old G3P3 with chronic pelvic pain and abnormal uterine bleeding requiring blood transfusion who failed medical management and was referred to our clinic for definitive surgical management. Her surgical history is significant for three prior cesarean sections and tubal ligation. Pelvic ultrasound notable for fundal fibroid, left ovary with 8 cm cystic mass and left hematosalpinx.

Interventions: Patient placed in dorsal lithotomy in Trendelenburg position with uterine manipulator in place. Patient underwent robotic-assisted laparoscopic hysterectomy, bilateral salpingectomy and left oophorectomy with lysis of adhesions and bilateral ureterolysis.

Measurements and Main Results: The retrograde technique to dissect the obliterated cul de sac poses risk for injury to rectum, ureters and hypogastric nerves during hysterectomy. Here, we present a technique to safely dissect rectum from the obliterated cul-de-sac. First, we show bilateral ureterolysis and ligation of ureteric artery at the origin to decrease risk of ureteral injury and for early control of blood supply. We show mobilization of the sigmoid colon starting above the pelvic brim. We then show a technique to perform dissection of the rectum starting at the rectovaginal septum medial to the uterosacral ligaments. The dissection is carried from deep to superficial until the rectosigmoid is completely mobilized. The remainder of hysterectomy and resection of side wall endometriosis was thus completed without any complications. Final pathology was consistent with 18cm endometrioma and uterine leiomyoma.

Conclusion: The retrograde technique to dissect the obliterated cul de sac in stage IV endometriosis is a safe surgical approach to restore normal anatomy in advanced endometriosis. These steps will help surgeon access correct surgical planes to minimize risk of injury and blood loss.

Open Communications 14: Robotics (3:00 PM — 4:00 PM)

3:12 PM

Tips and Tricks for Adapting to Single Port Robotic Surgery
Misal M.,* Delara R.M.M., Yi J., Maghiyab P.M. Department of Medical and Surgical Gynecology, Mayo Clinic, Phoenix, AZ
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Study Objective: Demonstrate ways of successfully navigating inherent limitations to the robotic single port surgical modality in the context of hysterectomy.

Design: Demonstration of surgical technique.

Setting: Academic medical center.

Patients or Participants: Women undergoing robotic single port surgery for benign indications.

Interventions: Robotic single port surgery using the SP1098 da Vinci SP® Surgical System.

Measurements and Main Results: The primary challenges with single port surgery are optimizing visualization and instrument mobility. The camera can be moved in a traditional fashion, or be cobra-ed, in which the camera retracts and is lifted above or below the instruments to allow for optimal utilization of space. It is best to keep the instruments as extended into the pelvis as is comfortable to allow the surgeon to engage the elbows of the instruments. Obtaining traction of tissue is limited with the single port robot. Medial traction and cephalad traction along the axis of the trocar is not restricted; however, adequate lateral or anterior traction is more challenging to obtain. The single port trocar accommodates a maximum of three instruments. However, two instruments are sufficient to achieve most surgical goals. If the fourth aperture of the trocar is not in use, a laparoscopic instrument can be inserted by the bedside assistant. Unfortunately, the assistant’s mobility is greatly restricted. Movement of any laparoscopic instrument is restricted to the axis of the single port trocar.

Conclusion: Robotic single port gynecologic surgery is achievable with minimal adjustments to surgical technique. Optimizing visualization and instrument mobility is key for successful use of this surgical modality.

Open Communications 14: Robotics (3:00 PM — 4:00 PM)

3:18 PM

Presacral Neurectomy: Literature Update and Surgical Approach
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Study Objective: This video will summarize the current literature and guidelines regarding presacral neurectomy (PSN), proper patient selection and surgical approach. We will identify the anatomy in the presacral space, relevant pelvic neuroanatomy and surgical pearls for performing PSN. The viewer will be able to apply key points from this video to clinical practice, allowing for optimization of PSN outcomes.

Design: N/A

Setting: Academic teaching hospital.
Patients or Participants: N/A

Interventions: PSN is a technically advanced pelvic denervation procedure. PSN has utility in addressing chronic pelvic pain and dysmenorrhea that specifically has a midline component. This video highlights the ongoing importance of effective patient selection, knowledge of anatomy and surgical expertise when performing PSN.

Measurements and Main Results: N/A

Conclusion: Presacral neuroectomy remains a useful tool for the appropriately trained surgeon in the management of chronic pelvic pain.

Open Communications 14: Robotics
(3:00 PM — 4:00 PM)

3:24 PM

Predictors of Total Operating Room Time for Minimally Invasive Benign Hysterectomy
Frost A.S., 1 Kohn J.R., 1 Mahmood M.E., 1 Tamborskeva A., 1 Hunt M.F., 3 Clark K., 3 Wang K.C., 3 Simpson K., 3 Wu H.Y., 3 Borahay M.A., 3 Patzkowsky K.E., 1 1Department of Gynecology and Obstetrics, Johns Hopkins University, Baltimore, MD; 2University of Central Florida College of Medicine/ICA GME/Ocala Regional, Ocala, FL, 3School of Medicine, Johns Hopkins University, Baltimore, MD; Division of Minimally Invasive Gynecologic Surgery, Johns Hopkins Hospital, Baltimore, MD; Division of Minimally Invasive Gynecologic Surgery, Johns Hopkins School of Medicine, Baltimore, MD
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Study Objective: To identify determinants of operative room (OR) time for benign, minimally invasive (MIS) hysterectomy and quantify the relative influence of pre-operative patient and surgical factors.

Design: Cross-sectional.

Setting: Five-hospital healthcare system.

Patients or Participants: Women undergoing MIS (laparoscopic or robotic) hysterectomy from July 2014 to February 2019 for benign indications (excluding prolapse).

Interventions: N/A

Measurements and Main Results: Assessed factors to predict OR time included patient (age, BMI, co-morbidities, race, insurance, uterine size on pre-operative imaging, indication for surgery), and surgical (route of surgery, surgeon specialty, surgeon volume, academic vs. community hospital, resident participation and concomitant procedures). Total OR time was measured as wheels in-wheels out time. Multivariate linear regression was used to develop a predictive model. A total of 1,549 hysterectomies performed during the study period with an average OR time of 200 minutes. Patient characteristics associated with a significantly increased OR time included: high BMI (+8-27min by category), 3 or more medical co-morbidities (+10-41min), non-White race (+7-10min), uterine size >10cm on pre-operative ultrasound (+25-141min). There was no relationship between OR time and indication for surgery (fibroids, endometriosis, adenomyosis, and abnormal uterine bleeding).

Compared with a laparoscopic approach, OR time was increased with a robotic approach (+33min). Compared to general gynecologists, gynecologic oncologists had longer operative times (+39min). When surgeon volume was included, for every hysterectomy performed per month on average, operative time decreased by 10 min. Resident participation resulted in a 10 min increased in OR time.

Within the five-hospital system, OR time was decreased at private and community hospitals (-16-49min). Concomitant adnexal procedures did not add statistically significant OR time.

Conclusion: Preoperative factors are associated with differences in total operative time and can be used to streamline OR schedules and productivity.

Open Communications 14: Robotics
(3:00 PM — 4:00 PM)

3:30 PM

Laparoscopic Appendectomy: Four Surgical Techniques for the Gynecologic Surgeon
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Study Objective: To demonstrate four surgical techniques for laparoscopic appendectomy including a novel approach to transvaginal appendectomy and considerations for use of each technique.

Design: A surgical video.

Setting: An academic medical center.

Patients or Participants: Four patients who underwent elective appendectomy.

Interventions: Outpatient laparoscopic or robotic-assisted appendectomy in 2019 or 2020.

Measurements and Main Results: In this surgical video, we present four techniques to perform a laparoscopic elective appendectomy. The first two techniques demonstrate variations of laparoscopic appendectomy performed with endoloop sutures. The third technique presented utilizes a laparoscopic stapler. The fourth technique presented is a novel approach to laparoscopic appendectomy utilizing an abdominal linear stapler through a transvaginal approach at time of hysterectomy. Additionally, we review considerations for use of each technique which include abdominal incision size, surgical instrument cost, operative time, and concomitant procedures performed.

Conclusion: Laparoscopic appendectomy at time of gynecologic surgery can be performed utilizing several different surgical techniques depending on surgeon preference. Understanding of anatomy, knowledge of the steps of the procedure, and good surgical technique are key for gynecologic surgeons to safely perform laparoscopic appendectomy.

Open Communications 14: Robotics
(3:00 PM — 4:00 PM)

3:36 PM

Management of Recurrent Colorectal Endometriosis with Segmental Resection
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Study Objective: To present a unique case of the workup and management of recurrent colorectal endometriosis utilizing a multidisciplinary team approach.

Design: Case Report.

Setting: Community teaching hospital. Collaborative robotic surgical team including a minimally invasive gynecologic surgeon and colorectal surgeon utilizing the Da Vinci Xi platform.

Patients or Participants: 38-year-old gravida 3, para 1 with a history of deeply-infiltrating endometriosis status post excisional surgery including shave excision of a colorectal implant six months prior. She presents with recurrent rectal pain and bleeding due to confirmed recurrent colorectal endometriosis.

Interventions: Following a multi-disciplinary case conference, colorectal surgery performed a robotic-assisted low anterior bowel resection with primary colorectal anastomosis and flexible sigmoidoscopy. Gynecology was
present to confirm all endometriosis excised and fertility was optimized for future planned frozen embryo transfer.

**Measurements and Main Results:** Complete excision of colorectal endometriosis with resolution of patient’s rectal pain and bleeding. Pathology showed transmural colorectal endometriosis including a rectal lymph node involved with endometriosis.

**Conclusion:** Unusual case of recurrent colorectal endometriosis following shave excision, managed with segmental colorectal resection. Endometriosis involving a lymph node shows the disease’s ability to be locally invasive however this phenomenon is not thought to lead to higher recurrence rates.

**Open Communications 15: Reproductive Medicine (3:00 PM — 4:00 PM)**

**3:00 PM**

**Hidden Spaces: Treatment of an Occult Utero-Vaginal Septum**

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**Study Objective:** To describe the unique presentation and surgical management of a complete utero-vaginal septum.

**Design:** Video case report.

**Setting:** Tertiary care academic medical center.

**Patients or Participants:** We present a 25-year-old G2P0020 who is referred for evaluation after imaging and clinical examination revealed conflicting information. She was initially seen by her local provider for menorrhagia. Locally, an ultrasound revealed a septate uterus and examination under anesthesia with hysteroscopy noted a single vagina and cervix with a unicornuate uterus. Due to incongruous findings, she was referred for evaluation.

**Interventions:** Magnetic resonance imaging (MRI), examination under anesthesia, vaginal surgery and operative hysteroscopy.

**Measurements and Main Results:** MRI identified a complete utero-vaginal septum with a single septate cervix. Vaginal gel was used to define vaginal anatomy and gel was noted to fill the right hemivagina, while none noted on the left.

Examination under anesthesia revealed an imperforate hymen with a small opening on the left as the cause for confusion in the clinical presentation. A hymenectomy was performed followed by guided surgical management of a complete utero-vaginal septum, unicollis.

**Conclusion:** Presentation of müllerian anomalies are often complex and anatomic variations in commonly described anomalies make misdiagnoses common. Advanced imaging with use of MRI with vaginal gel or 3-dimensional ultrasonography and detailed examination are often helpful. Differentiating between unicollis and bicollis presentations in complete utero-vaginal septum cases is an important distinction during surgical management.

**Open Communications 15: Reproductive Medicine (3:00 PM — 4:00 PM)**

**3:06 PM**

**Mini-Laparoscopic Isthmocele Repair**

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*Corresponding author.

**Study Objective:** Describe excision and repair of uterine isthmocele using mini-laparoscopic instruments.

**Design:** Instructional video on technique.

**Setting:** Individual case.

**Patients or Participants:** The patient is a 35yo g1p1 with prior term cesarean delivery and subsequent secondary infertility. Her workup was unremarkable apart from saline ultrasound showing a significant uterine isthmocele. Prior to moving forward with IVF, her reproductive endocrinologist recommended correction of the isthmocele.

**Interventions:** Laparoscopic repair of uterine isthmocele using 5 and 3-mm instruments

**Measurements and Main Results:** The isthmocele was completely excised and repaired with postoperative saline ultrasound showing thick myometrium in place of previous uterine defect.

**Conclusion:** Robust excision and repair of a uterine isthmocele can be readily accomplished with simply three small laparoscopic incisions.

**Open Communications 15: Reproductive Medicine (3:00 PM — 4:00 PM)**

**3:12 PM**

**In Vitro Fertilization in Women with Asherman’s Syndrome - Comparison of Maternal and Neonatal Morbidity**

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*Corresponding author.

**Study Objective:** We seek to examine effects of in vitro fertilization (IVF) on the maternal and neonatal morbidities of patients previously treated for Asherman’s syndrome.

**Design:** A retrospective cohort study using fertility and obstetrical data from our institution’s electronic medical records.

**Setting:** A community teaching hospital affiliated with a large academic medical center.

**Patients or Participants:** 43 singleton births identified from 40 women previously treated at our institution for Asherman’s syndrome.

**Interventions:** Data analysis comparing the maternal and neonatal outcomes in singleton births from Asherman’s syndrome patients who had been treated with hysteroscopic adhesiolysis, then either conceived spontaneously versus IVF.

**Measurements and Main Results:** Of the 43 singleton births, 27/43 (62.8%) were conceived spontaneously and 16/43 (37.2%) were conceived through IVF. No statistical differences were found in antepartum conditions within clinical pregnancies in patients who conceived spontaneously versus through IVF. There was no difference in the rate of preterm birth in Asherman’s pregnancies (11.6%) regardless of conception method. We documented 4/43 (9.3%) cases of IUGR in our study, with no difference in between spontaneous versus IVF conception groups. The rate of morbidly adherent placenta (MAP) in Asherman’s syndrome patients was 14.0%, with no differences in the rate of MAP found in the two conception groups. Postpartum hemorrhage in Asherman’s patients was documented at 32.6% (14/43). Newborn anatomic malformations of any cause were documented in 18.6% (8/43) of all singleton births.

**Conclusion:** Our series indicates a higher prevalence of IUGR, MAP, post-partum hemorrhage, and newborn anatomical malformations in Asherman’s syndrome pregnancies compared to incidences reported in pregnancies within the general population. However, we found no significant differences in the maternal and neonatal outcomes of Asherman’s syndrome.
syndrome patients who conceived either spontaneously or through IVF after being treated with hysteroscopic adhesiolysis.

Open Communications 15: Reproductive Medicine (3:00 PM — 4:00 PM)

3:18 PM

Surgical Management of Cesarean Scar Ectopic with Fertility Preservation
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Study Objective: To highlight retroperitoneal anatomy and show surgical techniques to minimize blood loss during cesarean scar ectopic resection.


Setting: University Hospital. Patient was in dorsal lithotomy position.

Patients or Participants: A 33 year-old woman G4P1 with a cesarean scar ectopic pregnancy at 10 weeks gestation that failed methotrexate injection.

Interventions: This video highlights entry into the retroperitoneal space and dissection technique for identifying the uterine arteries at their origins. Bulldog clamps are placed on all vascular pedicles that supply the uterus (bilateral uterine arteries and bilateral infundibulopelvic ligaments) to aid with hemostasis. Additionally, Vasopressin is used to further reduce blood loss. Applying these techniques allowed for successful resection of the ectopic pregnancy with only 50 cc of estimated blood loss. Control of bleeding resulted in thorough resection of the ectopic pregnancy while conserving as much surrounding myometrium as possible. The uterine defect is repaired in three layers.

Measurements and Main Results: Operative time was 199 minutes, with an estimated blood loss of 50 ml. Surgical resection of the ectopic pregnancy allowed the patient to preserve her fertility. Subsequently, the patient had an uncomplicated pregnancy which resulted in a live birth.

Conclusion: Knowledge of the avascular spaces and dissection techniques that allow for access to the origin of the uterine artery can be very useful in complex cases. Bulldog clamps can be used for transient occlusion of blood supply to the uterus resulting in resection of a cesarean scar ectopic with minimal blood loss. This is an option for patients who desire future fertility.

Open Communications 15: Reproductive Medicine (3:00 PM — 4:00 PM)

3:24 PM

Verbal Analgesia Is As Good As Oral Tramadol Prior to Intrauterine Device Insertion Among Nulliparous Women: A Randomized Controlled Trial
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Study Objective: To evaluate pain management strategies during insertion of intrauterine device (IUD) among nulliparous women as compared to the analgesic effects of oral tramadol and ‘verbal analgesia’ on pain relief.

Design: We conducted a randomized controlled trial from December 2015 to December 2018.

Setting: A multi-center outpatient clinics.

Patients or Participants: 54 nulliparous women.

Interventions: Patients who underwent Levonorgestrel-releasing intrauterine device (IUD) insertion were randomized for analgesic treatment or ‘verbal analgesia’ prior the IUD insertion.

Measurements and Main Results: All the patients were Caucasian. There was no difference between the two groups regarding gravidity, age, smoking or body mass index (BMI). No significant differences were detected between the groups on the procedure manner including ease of insertion (p=.415), number of insertion attempts (p=.514) and complicating events between the insertion (p=.150). Mean level of pain by VAS was 4.5±1.6 (2-8) for the tramadol group and 4.8±2.4 (0-10) for the verbal analgesia group. There was no spontaneous ejection of the IUD in either group, no case of endometritis, or discomfort that resulted in IUD removal.

Conclusion: There was no benefit for pain analgesia prior to the insertion of a IUD in nulliparous women. Verbal analgesia can be a suitable tool for this process and clinicians should become more familiar with its use.

Open Communications 15: Reproductive Medicine (3:00 PM — 4:00 PM)

3:30 PM

Step-By-Step Guide to the Surgical Management of Recurrent Intestinal Ectopic Pregnancy
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*Corresponding author.

Study Objective: The purpose of this educational video is to provide a brief overview of interstitial ectopic pregnancy, describe a rare case of a recurrent interstitial ectopic pregnancy after previous ipsilateral cornuectomy and demonstrate a minimally invasive surgical approach to management.

Design: N/A

Setting: Operating room at a tertiary care centre. Patient positioned in the dorsal lithotomy position.

Patients or Participants: We describe the case of a 38 year old G5P2 woman who presented with imaging concerning for a left interstitial ectopic pregnancy. She had previously undergone a left salpingectomy and left uterine wedge resection for separate pregnancies making the case complex and clinically fascinating. This educational video outlines clinical considerations and demonstrates the surgical approach to management.

Interventions: Laparoscopic resection of left interstitial ectopic pregnancy.

Measurements and Main Results: N/A

Conclusion: Recurrent interstitial ectopic pregnancy poses a high risk to patients but can be safely managed with a minimally invasive surgical approach when techniques focused on surgical planning, blood conserva-

Open Communications 15: Reproductive Medicine (3:00 PM — 4:00 PM)

3:36 PM

Obstetrical Outcomes Among Asherman’s Syndrome Patients: Comparing Classification Systems and Developing a Novel Calculator
Chen T.Y., 1 * Movilla P.R., 2 To S.B., 1 Morales B., 1 Wang J., 1 Wang J.R., 1 Williams A., 1 Reddy H., 4 Tavcar J., 1 Loring M., 1 Morris S.N., 1

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**Open Communications 15: Reproductive Medicine**

*3:00 PM — 4:00 PM*

**Surgical Technique for Removal of an Ovarian Ectopic Pregnancy: Minimizing Disruption of the Ovarian Stroma**

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**Study Objective:** To successfully complete laparoscopic removal of an ovarian ectopic pregnancy without the use of electrocautery and with minimalization of damage to the ovarian stroma.

**Design:** N/A

**Setting:** The patient was placed in dorsal lithotomy position in steep Trendelenburg to aid in performance of pelvic laparoscopy. Insufflation was carried out to 15mmHg. A primary 10mm umbilical trocar was used for the camera and three additional 5mm assist ports were placed.

**Patients or Participants:** The patient is a 34-year-old G4P1021 who was diagnosed with presumed left adnexal ectopic pregnancy at 6 weeks gestation following ovulation induction with intrauterine insemination. The patient required three doses of methotrexate in order to experience a decrease in HCG level. The patient then presented with worsening pelvic pain, and repeat transvaginal ultrasound showed presumed left ovarian ectopic pregnancy without evidence of rupture. After options counseling, she opted to proceed with laparoscopic ultrasound showed presumed left ovarian ectopic pregnancy using an Endoloop device.

**Interventions:** Diagnostic laparoscopy, removal of left ovarian ectopic pregnancy using an Endoloop device.

**Measurements and Main Results:** Final pathology confirmed ovarian ectopic pregnancy. HCG levels declined to <5 mIU/mL within 1 month following surgery. No further surgical or medical management was required.

**Conclusion:** Ovarian ectopic pregnancies can be safely and effectively removed using this simple technique while minimizing the risk of damage to ovarian stroma that may occur when performing electrocautery or a wedge resection.

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**Open Communications 16: Laparoscopy**

*3:00 PM — 4:00 PM*

**Liver Laceration with Palmer's Point Entry in the Super Obese Patient**

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*Corresponding author.

**Study Objective:** The purpose of this video is to present an uncommon liver laceration complication with Palmer’s Point entry and describe considerations for laparoscopic entry in the obese patient.

**Design:** In this surgical video, we present a case report of a liver laceration during laparoscopic entry with Palmer’s Point on an obese patient with a body mass index of eighty-seven. Given this patient’s super obesity, both her external and internal anatomy were distorted contributing to our surgical complication. Additionally, we describe strategies and considerations for laparoscopic entry in the obese patient with specific emphasis on the consideration of hepatomegaly due to fatty liver disease. Finally, we discuss the management of liver lacerations as recommended by the American Association for the Surgery of Trauma.

**Setting:** Operating room.

**Patients or Participants:** 34-year-old patient with super obesity presenting to our emergency room department with a large pelvic mass.

**Interventions:** Laparoscopic cystectomy.

**Measurements and Main Results:** N/A

**Conclusion:** A diagnosis of hepatomegaly must be considered in the super obese patient prior to planning laparoscopic entry using Palmer’s point.

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**Open Communications 16: Laparoscopy**

*3:00 PM — 4:00 PM*

**Retrograde Bladder Filling after Laparoscopic Gynecologic Surgery and Hospital Discharge: A Randomized Controlled Trial**

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*Corresponding author.

**Study Objective:** To determine whether retrograde bladder filling after outpatient gynecologic surgery (excluding hysterectomy and pelvic reconstructive surgeries) expedites time to first void and discharge from hospital.

**Design:** Double-blind randomized controlled trial.

**Setting:** Downtown academic day-surgery hospital.
Open Communications 16: Laparoscopy
(3:00 PM — 4:00 PM)

3:12 PM

Moreculation Not Required: Mini-Laparotomy Does Not Alter Same-Day Discharge Plan
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*Corresponding author.

Study Objective: The study objective was to evaluate whether the need for mini-laparotomy (ML) for intact specimen extraction adversely impacted the feasibility or safety of same-day discharge (SDD) in patients undergoing minimally invasive surgery (MIS) for gynecologic malignancies.

Design: We performed a retrospective, matched, case-control study in patients undergoing MIS for gynecologic malignancy from January 2013 through December 2019.

Setting: Single institution.

Patients or Participants: Patients undergoing MIS for gynecologic malignancy from January 2013 through December 2019.

Interventions: Patients requiring ML for specimen extraction were identified and matched to randomly selected patients not requiring ML (2:1, controls/cases). Clinical demographics, peri-operative outcomes and post-operative contact within 30 days were collected. Standard statistical analyses were performed to evaluate the data.

Measurements and Main Results: A total of 891 patients were identified. Fifty-two patients required ML for specimen extraction. From the remainder, 104 patients were selected as controls. There was no difference in age (61 vs. 63 years, p=0.42) or BMI (32 vs. 30, p=0.29) between the cases and controls. SDD rate was 79% (ML) vs. 83% (control) (p=0.67). There was no difference in median pain scores (2.3 vs. 2.2, p=0.78), length of stay (LOS) (0 days for both, p=0.67), 30-day readmission rate (7% vs. 3%) (p=0.17), ED/Urgent care visit (21% vs. 14%) (p=0.28) or any patient contact (36% vs. 37%) (p=0.97), between the groups. Specimen weight was higher for ML (485g vs. 135g, p<0.0001), as was estimated blood loss (EBL) (99cc vs. 43cc, p<0.0001), and surgery time (121 min vs. 92 min, p<0.001). When controlling for age and BMI, only EBL and OR time differed between the two groups; EBL: 54cc (p<0.001, 95% CI 28-79), and OR time: 30 minutes (95% CI 17-43).

Conclusion: Mini-laparotomy for specimen extraction does not affect SDD rates after MIS. It is a safe and feasible strategy for patients with no apparent increase in complication rate or unscheduled patient contact.

Open Communications 16: Laparoscopy
(3:00 PM — 4:00 PM)

3:24 PM

Ultrasound Guided Laparoscopic Radiofrequency Ablation for Very Large Multi-Fibroid Uterus
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*Corresponding author.

Study Objective: This video describes the technique and advantages of laparoscopic radiofrequency ablation with ultrasound guidance for the treatment of very large multi-fibroid uteri.

Design: N/A

Setting: Large tertiary care hospital.

Patients or Participants: 45-year-old gravida 2 para 0 female with menorrhagia, dysmenorrhea, and bulk symptoms secondary to a very large multi-fibroid uterus. She desired a minimally invasive and uterine conserving method to treat her symptoms.
Interventions: We performed laparoscopic radiofrequency ablation under ultrasound guidance for the patients’ multiple fibroids. The uterus was mapped ultrasonographically using the laparoscopic ultrasound transducer. Next, under laparoscopic visualization, the needle handpiece was inserted into the abdomen three centimeters away from the ultrasound transducer insertion point. With careful coordination between visualization on the ultrasound and the laparoscope, the handpiece was directed into specific myomas for ablation with deployment of the needle arrays. This allowed emission of radiofrequency energy to shrink the myoma tissue. The exact depth and total ablation time is calculated for each deployment prior to initiation of the ablation. It is important to note that larger myomas may require multiple overlapping treatments due to their size and density. The procedure was performed in an outpatient setting with an estimated blood loss of less than 10 milliliters.

Measurements and Main Results: N/A

Conclusion: Laparoscopic radiofrequency ablation for very large multi-fibroid uterus can be successfully performed under ultrasound guidance as a uterine conserving method to treat symptomatic fibroids. This technique has many advantages when compared to other surgical techniques used to treat fibroids, including minimal blood loss, decreased post-operative pain, shorter recovery time, and a potentially narrower learning curve given that advanced laparoscopic suturing skills are not required.

Open Communications 16: Laparoscopy (3:00 PM — 4:00 PM)

3:30 PM

Disparities in Access to Minimally Invasive Hysterectomy in a Suburban Community Hospital: A Patient-Level Analysis

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Study Objective: Prior studies have identified differences in access to minimally invasive hysterectomy (MIH) based on demographic characteristics. These differences do not always persist when including patient-level information that may affect surgical decision-making. This study aims to identify racial or ethnic differences in access to MIH for non-white women. This was eliminated for black and “other” women after controlling for patient-level information but persisted in Hispanic women. Further study is warranted to better understand the factors underlying this finding.

Open Communications 16: Laparoscopy (3:00 PM — 4:00 PM)

3:36 PM

A Strategic Approach to a Total Laparoscopic Hysterectomy for an Advanced Cesarean Section Scar Ectopic Pregnancy with Cystotomy Repair.

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Study Objective: Present an interesting case of an advanced cesarean scar ectopic pregnancy that failed medical management and underwent treatment with a total laparoscopic hysterectomy.

Design: Video Case Report.

Setting: Tertiary Referral Hospital at a community-based OB/GYN residency program.

Patients or Participants: 37-year-old G3P3013 at 9 weeks gestation with a cesarean scar ectopic pregnancy.

Interventions: This video will present an interesting case of a 37yo G5P3013 that presented with a 9-week cesarean scar ectopic pregnancy. Initial treatment was with injection of KCL into the fetal heart and methotrexate into the gestational sac at 10 weeks gestation. The patient presented 5 weeks after initial treatment with persistent pain and vaginal bleeding. The patient was the thoroughly counseled on her treatment options. She had no desire for future pregnancy and the plan was made for total laparoscopic hysterectomy with bilateral salpingectomy. This video presentation shows how as strategic anatomic approach using isolation of the blood supply and utilizing avascular spaces can allow this case to be completed in a minimally invasive fashion. This case will also present the steps to repairing an incidental cystotomy that was encountered in the dissection.

Measurements and Main Results: N/A

Conclusion: Advanced cesarean scar ectopic pregnancy can be treated in a minimally invasive fashion with total laparoscopic hysterectomy when future fertility is not desired.

Open Communications 16: Laparoscopy (3:00 PM — 4:00 PM)

3:42 PM

Simplifying Transvaginal Natural Orifice Transluminal Endoscopic Surgery with a Two-Step Technique

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Study Objective: To describe a two-step technique which facilitates Transvaginal Natural Orifice Transluminal Endoscopic Surgery (vNOTES) and to demonstrate the feasibility of the technique in different conditions.

Design: Description of the technique and demonstration of its performance using surgical video footage.

Setting: A tertiary university hospital.

Patients or Participants: 3 patients with tubal ectopic pregnancy, 1 patient with pregnancy of unknown location, 1 patient with paraovarian cyst.
Interventions: At the beginning of the video, using surgical video footage from a case of tubal ectopic pregnancy, we demonstrated the performance of a posterior colotomy for VNOTES in a classic fashion. Following that, our two-step technique was demonstrated in detail using surgical video footage from 2 cases of ectopic pregnancy, with one of them having significant hemoperitoneum. Both of these patients underwent unilateral salpingectomy. At the end of the video, two other cases treated using the technique were briefly demonstrated; a patient with pregnancy of unknown location who underwent a diagnostic vNOTES alone (step 1 only) and a patient with a 10-cm paraovarian cyst who underwent cystectomy.

Measurements and Main Results: N/A

Conclusion: Advancements in minimally invasive surgery go in parallel with innovations and advancements in technology. However, improvements in existing techniques and utilization of new techniques are also crucial components of advancement. Based on our own experience with vNOTES and the existing knowledge about transvaginal hydrolaparoscopy (TVHL), we described the two-step technique demonstrated in this video. We believe that this technique may be beneficial to make vNOTES more widespread as it allows both diagnostic and therapeutic procedures to be carried out in a faster and safer manner without the need for any special equipment and without increasing the costs.

Open Communications 17: Endometriosis
(3:00 PM — 4:00 PM)

3:06 PM

Comparative Assessment of Nociceptive Mechanisms in Endometriosis Vs. Primary Dysmenorrhea
Ta F.F., 1,2,4 Ashenaft G., 2 Schroer M., 2 Hellman K.M. 1,3,4 1NorthShore University HealthSystem, Evanston, IL; 2University of Chicago Medicine, Chicago, IL; 3Oh/Gyn, NorthShore Health, Evanston, IL; 4Oh/Gyn, University of Chicago, Chicago, IL
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Study Objective: Endometriosis-associated pelvic pain patients frequently experience both cyclical menstrual pain and chronic pelvic pain, suggesting dysregulated central sensory processes. The amount that chronic pain experience affects experimental pain sensitivity in comparison to cyclical menstrual pain exposure, is unknown.

Design: Subanalysis of a broader, ongoing longitudinal study of concomitant menstrual pain and bladder pain in both chronic and cyclical pain cohorts of women. We characterized body, and vaginal mechanical sensitivity (pressure algometry) as well as visceral hypersensitivity (noninvasive cystometry) during the luteal phase. Participants completed Patient Reported Outcomes Measurement System (PROMIS) anxiety, depression, fatigue and sleep measures as possible QST covariates. Contrasts were done with Wilcoxon rank-sum tests.

Setting: Patients enrolled from 8/2014 to 12/2018 at Evanston Hospital.

Patients or Participants: Women with dysmenorrhea (DYS, n=153), healthy controls (n=40), and surgically confirmed endometriosis (n=20).

Interventions: N/A

Measurements and Main Results: Dys and endometriosis participants had more vaginal mechanical pain sensitivity than controls (median pressure pain threshold 7.3 N/cm² [interquartile range [IQR] 4.2, 11.0], 5.3 [IQR 3.3, 8.9] vs. 10.6[IQR 7.3, 14.6], p<0.001). Endometriosis patients had higher provoked bladder pain than DYS only patients, with both higher than controls (33.0[IQR 9.0, 50.0] vs. 7.0[IQR 2.0, 24.0], vs. 2.0 [IQR 0.0, 3.0], p=0.003). Consistent with chronic pain symptoms, endometriosis patients also had worse anxiety, depression, sleep, and fatigue profiles, (p<0.02) than either DYS or healthy controls. Psychosocial profiles did not predict QST findings (p>0.05).

Conclusion: Endometriosis’ distinct nociceptive profile compared with pure dysmenorrhea suggests chronic pain experience has only a modest additional impact on mechanical hypersensitivity, with far greater impact on visceral (bladder) hypersensitivity.

Open Communications 17: Endometriosis
(3:00 PM — 4:00 PM)

3:12 PM

Fertility- and Nerve-Sparing Laparoscopic Eradication of Deep Endometriosis with Anterior and Posterior Compartment Peritoneomy
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*Corresponding author.

Study Objective: To show anatomical and technical highlights of novel nerve-sparing laparoscopic eradication of deep endometriosis (DE) with anterior and posterior compartment peritoneomy.

Design: Stepwise demonstration of the technique.

Setting: An urban general hospital. Laparoscopic nerve-sparing techniques represented by the Negrar method have been described as resulting in lower rates of postoperative bladder, rectal, and sexual dysfunctions than classical approaches. In addition, a recent paper showed that complete excision of DE with the posterior compartment peritoneomy could be surgical treatment of choice to decrease postoperative pain, improve fertility rate, and prevent future recurrence. However, a fertility- and nerve-sparing procedures are even more challenging than oncologic radical
Procedures because the pathology resembles advanced cervical cancer and ovarian cancer.

**Patients or Participants:** N/A

**Interventions:** After adhesiolysis and ovarian surgery, we developed retroperitoneal space at the level of promontory. The hypogastric nerve consists of the upper edge of pelvic plexus, so autonomic nerves were separated as a “nerve plane” by sharp interfascial dissection of the loose connective tissue layers both above (between fascia propria of rectum and prehypogastric nerve fascia) and below (between prehypogastric nerve fascia and presacral fascia) the hypogastric nerve. As a result of these dissections, autonomic nerves in pelvis were separated like a sheet with surrounding fascia. We then completely resected all DE lesions including peritoneal endometriosis while avoiding injury to the nerve plane.

**Measurements and Main Results:** No patients (n=40) developed postoperative bladder, rectal, and sexual dysfunctions after the surgery. This nerve-sparing method is a modification of the technique of total mesorectal excision (TME) and total mesometrial resection (TMMR). We considered that this nerve-sparing technique is also applicable to segmental bowel resection and radical hysterectomy.

**Conclusion:** Our novel nerve-sparing surgery based on detailed mesorectal anatomy reproducibly simplify this complex procedure. Step-by-step technique help to perform each part of the surgery in a logical sequence, making the procedure easier and safer to complete.

Open Communications 17: Endometriosis
(3:00 PM — 4:00 PM)

3:18 PM

**Preservation of Ovarian Reserve and Hemostasis during Ovarian Cystectomy: A Randomised Controlled Trial**

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**Study Objective:** This study aims to evaluate the safety and efficacy of the hemostatic agent on ovarian reserve during laparoendoscopic single-site (LESS) ovarian cystectomy.

**Design:** Investigator-initiated, single-blinded, randomized controlled trial.

**Setting:** LESS ovarian cystectomy.

**Patients or Participants:** From December 2017 to February 2019, 52 patients with benign unilateral ovarian cysts were enrolled.

**Interventions:** We performed LESS unilateral ovarian cystectomies based on the same surgical protocol, minimizing bipolar coagulation. In the coagulation group, the patients received hemostasis using bipolar coagulation, whereas oxidized cellulose polymer was applied in the hemostatic agent group.

**Measurements and Main Results:** We compared the hemoglobin (Hb) and anti-Müllerian hormone (AMH) levels, and ovarian volumes just before surgery, and two days (2D-POST), one week (1W-POST), and three months after surgery (3M-POST), and the decline ratio. There were no differences in the Hb levels, AMH levels, or ovarian volumes just before surgery, and two days (2D-POST), one week (1W-POST), and three months after surgery (3M-POST), and the decline ratio. Moreover, there were no differences in the decline ratio of the Hb levels and ovarian volumes between the two groups, whereas the decline ratio of serum AMH levels was greater at 3M-POST in the coagulation than in the hemostatic agent group. Overall, the difference of decline ratio of serum AMH levels was prominent in the coagulation than in the hemostatic agent group. When only patients with endometriosis were included in the analysis (median; ITT, -50.7 vs. -14.4%; PP, -50.7% vs. -14.4%; P < 0.05). Notably, the difference of decline ratio of serum AMH levels was prominent in the coagulation than in the hemostatic agent group. When only patients with endometriosis were included in the analysis (median; ITT, -50.7 vs. -14.4%; PP, -50.7% vs. -14.4%; P < 0.05). There was no difference between the two groups when only patients with non-endometriosis were included in the analysis.

**Conclusion:** Oxidized cellulose polymer hemostatic agents may be non-inferior to bipolar coagulation for preserving ovarian reserve and hemostasis during LESS ovarian cystectomy. In particular, the hemostatic agent may be better for preserving ovarian reserve than bipolar coagulation in patients with ovarian endometriosis.

Open Communications 17: Endometriosis
(3:00 PM — 4:00 PM)

3:24 PM

**Technique and Initial Results of the Laparoscopic Nerve-Sparing Ultralateral Resection (LaNSURe) of Parametrial Endometriosis**

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**Study Objective:** Parametrial endometriosis (PE) is a poorly understood and under-recognized form of deeply infiltrating endometriosis and represents a suspected cause of persistent pelvic pain after traditional excision of endometriosis. The detailed description of the clinical symptoms and signs associated with this presentation of the disease, as well as the success rate of the outcomes of the radical LaNSURe treatment strategy will contribute to closing a substantial gap in endometriosis care in Canada.

**Design:** Retrospective-prospective cohort study of patients undergoing a surgical intervention (Canadian Task Force II-3).

**Setting:** Tertiary Referral Center.

**Patients or Participants:** Interim analysis of an ongoing retrospective-prospective study that currently includes 28 patients who underwent the LaNSURe technique for the treatment of pathology-confirmed PE.

**Interventions:** Radical laparoscopic treatment of endometriosis, including a unilateral or bilateral parametrectomy using the Laparoscopic Nerve-Sparing Ultralateral Resection of Endometriosis (LaNSURe) technique.

**Measurements and Main Results:** Before each preoperative visit, patients filled out a questionnaire which included Visual Analog Scale (VAS) to report the average pain they experience, the maximum pain during flaring up and the minimal pain they feel as well as specific health-related quality of life questionnaires. The primary outcome was the average VAS scores before surgery and at the last postoperative visit. Mean follow-up time was 4.3±2.1 months.

The Average VAS post-surgery significantly decreased from preoperative 5.9±1.9 to 4.0±2.5 (p=0.004). Maximum pain went down from 7.9±2.2 to 5.3±3.0; (p=0.001). McGill Pain Questionnaire improved from 34.6±19.3 to 23.5±15.9 (p=0.04), Pain Catastrophizing Scale from 28.4±12.7 to 16.4±14.9 (p=0.005), and Pelvic Floor Distress Inventory from 164.7±44.3 to 136.2±40.6 (p=0.03).

Twenty out of 28 (71.4%) patients underwent one or more previous excision surgery by an endometriosis specialist.

**Conclusion:** The LaNSURe technique is effective at improving overall pain and quality of life while preserving nerve function in the pelvic floor.

Open Communications 17: Endometriosis
(3:00 PM — 4:00 PM)

3:30 PM

**Effects of Opioid Dependence on Outcomes of Laparoscopic Nerve-Sparing Ultralateral Resection (LaNSURe) of Parametrial Endometriosis**

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Study Objective: Chronic opioid prescription (COP) undermines the endogenous analgesia system. Parametrial endometriosis (PE) affects the nerves of the parametria and pelvic sidewall, producing neuropathic and other somatic symptoms, not usually correlated with endometriosis. Wrong/lack of diagnosis results in many patients under COP. The objective of this study was to assess the impact of COP on surgical outcomes of patients undergoing the LaNSURe of PE.

Design: Retrospective-prospective cohort study with surgical intervention (Canadian Task Force II-3).

Setting: Tertiary Care Center.

Patients or Participants: Interim analysis of an ongoing retrospective-prospective study that currently includes 28 patients who underwent the LaNSURe technique for the treatment of pathology-confirmed PE.

Interventions: LaNSURe of PE.

Measurements and Main Results: Eight out of 28 (28.6%) patients were under COP. Compared to opioid-naïve patients, their preoperative average (7.9±1.1 vs. 5.2±1.6; p<0.003) and maximum (9.3±0.8 vs. 7.4±2.4; p<0.05) VAS pain scores were significantly higher preoperatively.

While opioid-naïve patients experienced a significant reduction of average pain (from preop 5.2±1.6 to 3.0±1.9; p=0.001), COP patients did not (preop 7.9±1.1 to 6.4±2.1; p=0.13). The same was true for maximum pain (opioid naïve 7.4±2.4 to 4.1±2.7; p=0.0004; COP 9.3±.8 to 8.1±1.6; p=0.02).

Opioid-naïve patients experience a significant reduction in the Pain Catastrophizing Scale (26±13 to 15±13.2; p=0.006), and Pelvic Floor Distress Inventory (161.5±44.9 to 128.3±39.4; p=0.03) and a trend to reduction on McGill Pain Score and the Female Sexual Function Index.

COP quality of life measures failed to improve on any of those parameters.

Conclusion: Radical surgical treatment of PE may be less effective in patients under COP. Larger, more adequately powered trials are needed to verify this trend and assess the impact of opioid-cessation before surgery, to evaluate if these changes are reversible.

Open Communications 17: Endometriosis
(3:00 PM — 4:00 PM)

3:36 PM

Parametrial Endometriosis Part 3: Introducing a Nerve Sparing Technique to the Parametrectomy

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Study Objective: This is the third video of a series introducing the concept of parametrial endometriosis (PE) and describing our surgical approach in treating this particular disease presentation. The objective of this video is to review the anatomy and innervation of the parametrium and introduce the surgical technique and efficacy of the Laparoscopic Nerve-Sparing Ultralateral Resection (LaNSURe) of PE.

Design: Educational video that introduces the nerve-sparing surgical treatment of PE, a specific pattern of endometriosis with a unique constellation of symptoms and reviews initial results of a retrospective review of these patients.

Setting: Compilation of anatomy schematics and surgical video clips from a tertiary center demonstrating the novel surgical technique for Laparoscopic Nerve-Sparing Ultralateral Resection (LaNSURe) of PE.

Patients or Participants: This video is part of an ongoing retrospective-prospective study that currently includes 28 patients who underwent surgical parametrectomies for the treatment of PE. Surgical video clips have been extracted from such patients.

Interventions: Anatomy schematics and surgical dissection video clips demonstrating the anatomy and innervation of the parametria while introducing our LaNSURe technique for the treatment of PE.

Measurements and Main Results: PE infiltrates towards the pelvic sidewall and intrapelvic portions of the lumbosacral plexus producing symptoms such as lateral hip, sacral, groin and posterior thigh pain. Our initial study results yield promising efficacy of the LaNSURe technique. We have found significant improvement of pelvic pain post-operatively as well as improved quality of life through patient questionnaires completed post-surgical resection.

Conclusion: PE is a unique presentation of endometriosis with a specific constellation of symptoms. This video introduces the surgical technique of the Laparoscopic Nerve-Sparing Ultralateral Resection (LaNSURe) of PE which has demonstrated encouraging initial results. Long-term follow up will be completed in the future.
**Abstracts / Journal of Minimally Invasive Gynecology 27 (2020) S1–S82**

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**Study Objective:** Historically, surgery was learned in the operating room after first reading step-by-step instructions in a well-respected and well-illustrated text-book. Today, with technology at their fingertips, young surgeons seek and utilize video for learning surgical procedures. Often however, the more important “why” behind many surgical steps is left out. Our objective therefore, was to marry the demonstration of the anatomy with the why in order to provide a more complete experience for the learner.

**Design:** N/A

**Setting:** Operating room.

**Patients or Participants:** Patients undergoing planned hysterectomy for pelvic organ prolapse repairs who provided consent for filming.

**Interventions:** We carefully walk through performing the steps of a complete vaginal hysterectomy. We begin with identifying the cervix, and finish demonstrating how to check the pedicles for occult bleeding once the uterus and cervix are removed. We include tips and tricks within the video with specific benefits related to each suggestion, to help provide the “why”. We cover many of the most challenging areas for new surgeons in completing a successful vaginal hysterectomy. We cover plane development, efficient tying technique, aids for visualization, introduction of a modified Heaney stitch, which brings each pedicle together, closing the gaps between them and greatly reducing blood loss, and provide and demonstrate other pearls throughout.

**Measurements and Main Results:** N/A

**Conclusion:** If performed correctly, utilizing the techniques and tips included in this instructional video, the gynecologic trainee will enter the operating room for their first hysterectomy, empowered with knowledge and understanding that typically are learned during their first five to ten cases. Thus, empowering them with a framework for not only success in their first case, but one they can carry with them through their career.

Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

**3:06 PM**

**Fundamentals of Laparoscopic Surgery Pro Tips Series**

**Part 1: Tasks # 1, 2, & 3**

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**Study Objective:** This objective of this video is to describe several tips and tricks to help familiarize residents with the Fundamentals of Laparoscopic Surgery (FLS) tasks and to improve their technical skills and efficiency. In part 1 of this 2-part series, we provide specific strategies for the peg board, circle cut, and ligating loop tasks.

**Design:** Educational instructional video.

**Setting:** N/A

**Patients or Participants:** N/A

**Interventions:** FLS uses five simulation stations to assess basic laparoscopic surgery skills. It is a reliable and valid curriculum which has been shown to improve intraoperative trainee performance. It was developed in 2004, and since 2009 has been a requirement to qualify for the American Board of Surgery board certification. In 2018, the American Board of Obstetrics and Gynecology (ABOG) announced that FLS will be a prerequisite for specialty board certification for obstetrics and gynecology residents graduating after May 2020. ABOG states that this will “ensure that diplomates possess critical skills for the contemporary practice of obstetrics and gynecology.”

**Measurements and Main Results:** N/A

**Conclusion:** FLS is now a requirement for all OB/GYN residencies. Mastering the skills requires time and effort on the part of the learners but using these pro tips can help gain confidence and improve efficiency.

**Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)**

**3:12 PM**

**The Fundamentals of Laparoscopic Suturing (FLS) “Illusion of Validity” in Laparoscopic Vaginal Cuff Suturing, Is There Anything Better?**

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**Study Objective:** The “illusion of validity” is a cognitive bias in which the ability to interpret and predict surgical performance accurately is overestimated. To address this cognitive bias, and to determine the most representative task for laparoscopic cuff suturing, we assessed participants on simulation tasks and in placement of the first suture in the vaginal cuff of a cadaver.

**Design:** Validity (Messick Framework) study comparing FLS and non-FLS tasks to cadaveric vaginal cuff suturing.

**Setting:** Simulation center cadaver lab.

**Patients or Participants:** Obstetrics and gynecology residents (n=21), fellows (n=3), gynecologic surgical subspecialists (n=4), general obstetrician/gynecologists (n=10).

**Interventions:** Tasks included a simulated vaginal cuff (ipsilateral port placement), needle passage through a metal eyelet loop (contralateral and ipsilateral), and intracorporeal knot tying (contralateral and ipsilateral). Times on these tasks were compared to the placement of the first cadaveric vaginal cuff suture time, as well as the in-person and blinded Global Operative Assessment of Laparoscopic Skills (GOALS) score (validity evidence). Statistical analyses included Spearman’s test of correlation (continuous and ordinal variables) or Wilcoxon rank sum test (categorical variables).

**Measurements and Main Results:** A strong agreement between the in-person and blinded GOALS (ICC=0.80), and strong correlations of cadaver cuff time with in-person (Spearman’s r=-0.84,P<0.001), and blinded GOALS (r=-0.76,P<0.001) suggested internal structure validity evidence. Measures that were associated with cadaveric performance included subspecialty training (P=0.002), number of total laparoscopic hysterectomies (r=-0.53,P<0.001), number of laparoscopic cuff closures (r=-0.61,P<0.001), number of simulated laparoscopic suturing experiences (r=-0.51,P<0.001), simulated vaginal cuff suturing time (r=0.73,P<0.001), eyelet contralateral time (r=0.52,P<0.001), and FLS intracorporeal knot contralateral time (r=0.54,P<0.001).

**Conclusion:** Laparoscopic cadaveric vaginal cuff suturing performance was generally poor among residents and non-subspecialist gynecologists suggesting an “illusion of validity” in current surgical assessments. Since gynecology specific validity evidence has not been established for the FLS intracorporeal suturing task, we recommend prioritizing the use of a simulated-vaginal cuff suturing assessment instead of FLS.
Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

3:18 PM

Virtual Laparoscopic Skills Training Guide for FLS (Fundamentals of Laparoscopic Surgery) (3:18 PM)

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Study Objective: The objective of this video is to provide an example of how to teach laparoscopic skills, specifically FLS (fundamentals of Laparoscopic Surgery) virtually and remotely.

Design: This is an educational video. Institutional review board approval was not required for this video article as the video does not describe a clinical case but rather laparoscopic simulation.

Setting: Academic teaching hospital.

Patients or Participants: Gynecologic surgery trainees.

Interventions: The video demonstrates how to set up a portable laparoscopic trainer box for mobile devices and provides tips and tricks to optimize a virtual platform for teaching FLS (Fundamentals of Laparoscopic Surgery).

Measurements and Main Results: The key elements for successful implementation of virtual laparoscopic skills training include accessibility to low-cost portable laparoscopic trainers, a mobile device and a virtual platform.

Conclusion: Tele-simulation for laparoscopic skills training is feasible and cost-effective.

Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

3:24 PM

Anatomic Considerations for Diaphragmatic Endometriosis (3:24 PM)

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*Corresponding author.

Study Objective: Review diaphragmatic endometriosis and important diaphragm anatomy for the purpose of treatment.

Design: Case Review.

Setting: Pt was brought to the operative room and placed in dorsal lithotomy position. General anesthesia was conducted. Three laparoscopic ports were placed. One was umbilical and two in the lateral abdominal aspects.

Patients or Participants: We present a 30-year-old nulligravid female with a history of chronic pelvic pain, catamenial pain with breathing, infertility, and Stage III endometriosis.

Interventions: Patient was taken to the operating room for excision of endometriosis, peritoneal stripping, appendectomy, and excision of diaphragmatic endometriosis in a joint case with general surgery.

Measurements and Main Results: N/A

Conclusion: This video successfully reviewed the symptoms, incidence, and etiology of diaphragmatic endometriosis. Appropriate imaging for diagnosis and pre-operative workup with MRI was overviewed. We also discussed the anatomy and innervation of the diaphragm as well as surgical considerations for removal of endometriosis of the diaphragm.

Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

3:30 PM

Impact of Implementing Curriculum for Resident Education in Surgical Technique (CREST): A Train-the-Trainer Simulation Course (3:30 PM)

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Study Objective: To evaluate the impact of a platform of educational resources on the surgical curriculum in Ob-Gyn residency programs.

Design: A website was created to house simulation resources modeling basic laparoscopic skills in preparation for the Fundamentals of Laparoscopic Skills (FLS) assessment. A hands-on, simulation-based seminar was developed to demonstrate training and performance of surgical skills while educating participants on optimizing access and use of these resources.

Setting: Seminars conducted at 7 regional ACOG meetings and 3 national meetings of AAGL, the Council for Resident Education in Obstetrics and Gynecology (CREOG), and the Association of Professors of Gynecology and Obstetrics (APGO).

Patients or Participants: 190 ObGyn residents and 125 residency program directors (PDs) or assistant PDs completed the seminars.

Interventions: Expectations were assessed before and after training groups of participants. Expert surgeon-trainers coached small groups in laparoscopic surgical tactics, demonstrating the use of text- and video-based resources as well as hands-on experience with skills simulations using commercially available instruments and materials. Participants rotated around six laparoscopy box trainer-stations, practicing each skill set while receiving expert feedback.

Measurements and Main Results: Participants completed pre- and post-intervention surveys (n=32 and 73, respectively), and were asked to review materials on the website. Before training, needs expressed included desire to learn tips and tricks to train residents (85%), acquire curriculum development skills (74%), and gain exposure to a simulated test environment (65%). Post-intervention, 86% of respondents reported their expectations were met. The average participant rating was 4.3 on a scale of 1 (not at all helpful) to 5 (very helpful). Monitoring of Post-intervention website visits, video review, and resource downloads data suggest continued interest and program sustainability.

Conclusion: With a reliable needs assessment prior to implementation, appropriate organization, and expert trainers, a well-planned surgical curriculum program can deliver sustainable impact.

Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)

3:36 PM

The Impact of Simulation on Clinical Outcomes and Surgical Performance By Obstetric and Gynecology Trainees: A Systematic Review (3:36 PM)

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*Corresponding author.
**Study Objective:** The value of simulation to develop specific skills in a controlled environment is well established among surgical specialties. It is unknown whether such skills transfer to clinical settings. The aims of this review were: 1. to determine if simulation training translates to improved surgical performance by Obstetric/Gynecology (OB/GYN) trainees in operative settings; 2. to determine impact of simulation on clinical outcomes.

**Design:** MEDLINE, EMBASE, Cochrane, ERIC, and PsycINFO databases were searched through October 2019 to identify studies evaluating the use of simulation among OB/GYN trainees. Studies were included if they assessed trainee’s skills in real surgical cases by objective measure after implementation of simulation training. Studies assessing only simulator performance were excluded.

**Setting:** N/A

**Patients or Participants:** OB/GYN trainees.

**Interventions:** Simulation training.

**Measurements and Main Results:** 457 abstracts were screened and 16 included in the final analysis. Most studies used an Objective Structured Assessment of Technical Skills (OSAT) or modified version during laparoscopic salpingectomy or tubal ligation. Ten studies found performance improvement after simulation training. Fewer studies assessed impact on clinical outcomes. Of these, half noted a decrease in operative time with simulation. Length of stay was found to significantly decrease; however, no significant difference in other clinical outcomes was noted following simulation. Most trainees reported satisfaction and self-perceived increase in surgical skills following simulation training.

**Conclusion:** This is the first systematic review to evaluate the translation of gynecologic surgical skills to the operating room following simulation training. Skills developed through simulation appear to be transferable to the operating room. More numerous studies are needed to better assess effects on clinical outcomes and whether findings hold true with increasing case complexity.

**Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)**

**3:42 PM**

**Autophagy in Endometriosis: Beta-Catenin Suppressing Role**

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*Corresponding author.

**Study Objective:** To evaluate the occurrence of the autophagic process in ovarian endometriomas (OE), rectocervical endometriosis (RE), adenomyosis (A), and peritoneal endometriosis (PE) compared with eutopic endometrium and, pending clinical studies, become a part of target-based endometriosis therapy.

**Design:** Prospective cohort study, Level II-1.

**Setting:** National Medical Research Center for Obstetrics, Gynecology and Perinatology, Ministry of Healthcare of the Russian Federation.

**Patients or Participants:** We recruited 120 patients with endometriosis and adenomyosis: 47 patients with (OE), 20 patients with (RE), 20 patients with (A), 33 patients with (PE).

**Interventions:** All patients had laparoscopic surgery performed in the proliferative non-menstrual phase of their menstrual cycle. Histological analysis was carried out according to a standard procedure. Immunohistochemical analysis of ectopic and eutopic endometrium samples was carried out using the Tissue-Tek Quick-Ray kit, which allows for the preparation of paraffin blocks with a large number of tissue samples (tissue microarrays). Antibodies to LAMP 1 (1:100), LC3 (1:50), bcl-2 (1:50), (Ventana, Roche) were used.

**Measurements and Main Results:** In patients with EO, RE, A and PE, we noticed a significant down-regulation of autophagy (LAMP1 and LC3 expression) and up-regulation of beta-catenin expression in ectopic endometrium compared with the eutopic endometrium of affected women (p<0.05). Our study did not demonstrate the difference in expression of tested markers among endometriosis lesions of different localizations (p>0.05). This data is consistent with our previous observation made on smaller number of patents, possibly confirming the data.

**Conclusion:** We hypothesized that there is a relationship between autophagy and wnt/signaling pathway regulation, demonstrating the inverse ratio between beta-catenin and autophagy-marker expression. Based on the results in this study, we can say with increased certainty that increased beta-catenin could suppress autophagy, supporting ectopic endometrium through anoikis and other types of apoptosis. So we can suppose that target-based therapy suppressing the wnt/beta-catenin pathway can activate autophagy in endometriosis and, pending clinical studies, become a part of target-based pre-surgical, intra-operative, and post-operative endometriosis therapy.

**Open Communications 18: Basic Science/Research/Surgical Education (3:00 PM — 4:00 PM)**

**Survey on Postponement of Benign Gynecologic Surgery during the COVID-19 Pandemic**

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*Corresponding author.

**Study Objective:** To assess anxiety, satisfaction with interim medical care, and changes in medical status in patients who had benign gynecologic surgery postponed due to COVID.

**Design:** Online patient survey.

**Setting:** New York City Academic Medical Center.

**Patients or Participants:** In Mid-March of 2020 there was a moratorium on elective services due to the COVID-19 pandemic. In our institution, 220 patients were identified who had gynecologic surgery postponed. Of these patients, 150 patients were successfully contacted and invited to participate in the study, and 86 completed the survey.

**Interventions:** The research instrument was an online survey, which included a validated anxiety questionnaire.

**Measurements and Main Results:** Indications for surgery were fibroids (48%), abnormal bleeding (16%), ovarian mass (16%), endometriosis (12%), incontinence (8%), infertility (7%), prolapse (5%), and dysplasia (2%). On the Zung Self-Rated Anxiety Scale, 92% scored within normal range and 8% scored mild-to-moderate anxiety level. 50% of patients reported feeling more anxious about COVID exposure, 22% were more anxious about waiting for surgery, and 28% were equally anxious about both. Sentiment analysis of an open-ended question about postponement revealed 52% of responses were negative, 27% neutral, and 21% positive. Primary themes within negative responses were “frightened” or “disappointed” about surgery cancellation. Primary themes within positive responses were “safe” or “relieved.”

During the postponement, 60% of patients reported symptoms were the same, 27% worse, and 13% better. 36% of patients reported using alternative therapy while awaiting surgery, the most common being non-opioid pain medication (37%), hormonal therapy (29%), dietary changes (29%), supplements (20%), bladder training exercises (7%), pessary (2%), and pelvic floor physical therapy (2%). 80% reported access to MyChart, and 30% participated in telehealth visits, of which all reported satisfaction with the visit.

**Conclusion:** Patients with benign gynecologic surgery postponed due to COVID-19 had a negative impression of this impact on their care.

Wednesday, November 11, 2020

Open Communications 19: Laparoscopy (4:00 PM — 5:00 PM)

4:00 PM

Prospective Evaluation of Post-Operative Pain and Erythema Stratified By Anti-Slip Bed Surface

Obstetrics and Gynecology, University Hospitals, Cleveland Medical Center, Cleveland, OH; Case Comprehensive Cancer Center, Case Western Reserve University, Cleveland, OH; Obstetrics and gynecology, University Hospitals, Cleveland Medical Center, Cleveland, OH

Design: Prospective randomized controlled trial with a minimum 6-week post-operative follow up

Setting: Patient positioning with Trendelenburg

Patients or Participants: Patients undergoing major laparoscopic or vaginal surgery (hysterectomy or surgery >2 hours) were randomly assigned to one of three anti-slip surfaces: Pink Pad, Action O.R. Overlay (gelpad) or Olympic Vac-Pac (beanbag) from 6/2018-12/2019. 159 patients were enrolled with 148 found to be eligible.

Interventions: Patients were randomized 1:1:1 one of three anti-slip surfaces: Pink Pad, Action O.R. Overlay (gelpad) or Olympic Vac-Pac (beanbag) from 6/2018-12/2019. 159 patients were enrolled with 148 found to be eligible.

Measurements and Main Results: Post-operative erythema was significantly less in the Pink Pad group versus the gelpad group. This finding presents a novel opportunity to limit the narrative of pain control after minimally invasive gynecologic surgery.

Conclusion: Preoperative morphine spinal injection for laparoscopic hysterectomy led to significantly lower pain scores and inpatient opioid consumption. Preoperative spinal anesthesia for benign laparoscopic hysterectomy may be helpful for enhancing the immediate postoperative experience.

Open Communications 19: Laparoscopy (4:00 PM — 5:00 PM)

4:06 PM

Pain Scores and Opioid Use Following Preoperative Spinal Anesthesia for Benign Laparoscopic Hysterectomy

Warta K., Osborne B., Lu X., Corbett W., Shakar R., Duggan K., Osborne B., Beste T., OBGYN, NHMRC, Wilmington, NC; OBGYN, NHMRC, Wilmington, NC; Anesthesiology, NHMRC, Wilmington, NC; Anesthesiology, NHMRC, Wilmington, NC; Statistics, NHMRC, Wilmington, NC

Study Objective: To assess differences in postoperative pain and erythema on a variety of anti-slip surfaces after minimally invasive gynecologic surgery

Design: Prospective randomized controlled trial with a minimum 6-week post-operative follow up

Setting: Patient positioning with Trendelenburg

Patients or Participants: Patients undergoing major laparoscopic or vaginal surgery (hysterectomy or surgery >2 hours) were randomly assigned to one of three anti-slip surfaces: Pink Pad, Action O.R. Overlay (gelpad) or Olympic Vac-Pac (beanbag) from 6/2018-12/2019. 159 patients were enrolled with 148 found to be eligible.

Interventions: Patients were randomized 1:1:1 one of the three anti-slip surfaces.

Measurements and Main Results: Patients were pre-operatively assigned to one of three anti-slip surfaces. Pain was assessed on a standard 1-10 scale and erythema was assessed as a binary, present or absent. Pain was assessed in pre-operative holding and as the first pain score after surgery by the anesthetics care unit nurse. Erythema was assessed in pre-operative holding and immediately after the operation. The pre-operative pain and erythema scores were not significantly different based on Tukey’s multiple comparisons and proportion test respectively. Post-operative back pain was significantly less in the Pink Pad group versus the gelpad (0.96 vs. 2.40 points, p=0.036). Post-operative erythema was significantly less common in the Pink Pad group versus the beanbag group (6.2% vs. 30% respectively, p=0.017).

Conclusion: While overall post-operative pain control was excellent, there was a significantly less pain in the Pink Pad group versus the gelpad group. This finding presents a novel opportunity to limit the narrative of pain control after minimally invasive gynecologic surgery. Given the difference in post-operative erythema between the Pink Pad and beanbag, further study is warranted to assess the role of bed surface and skin irritation.

Open Communications 19: Laparoscopy (4:00 PM — 5:00 PM)

4:12 PM

Reduction of Postoperative Gastrointestinal Dysmotility Following Total Laparoscopic Hysterectomy: A Randomized Controlled Trial

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Gynecology, Cleveland Clinic Florida, Weston, FL

Study Objective: To assess the effect of common bowel care regimens in time to bowel function following total laparoscopic hysterectomy (TLH).

Design: A prospective three-arm randomized controlled trial (Canadian Task Force Classification I).

Setting: Single academic-affiliated institution.

Patients or Participants: Women aged 18-85 years, without preexisting gastrointestinal disorders, undergoing TLH for benign indications.

Interventions: Patients were randomized to one of three arms using an equal allocation ratio to receive either no bowel care regimen (control group), docusate sodium, or polyethylene glycol 3350 (PEG) for the first five days following surgery. The primary outcome was time to first bowel movement postoperatively. Secondary outcomes were time to first flatus, total narcotic use in the first five days postoperatively, constipation score, and the Patient Assessment of Constipation Symptoms (PAC-SYM) questionnaire score.

Measurements and Main Results: There were no significant differences in time to first bowel movement postoperatively amongst those receiving no bowel care regimen, docusate sodium, or PEG (2.64 ± 1.19, 2.80 ± 1.08, 3.06 ± 1.18 days; p=0.436). Similarly, there were no significant differences in time to first flatus: 1.06 days (interquartile range 0.89-1.70) in the control group, 1.05 days (interquartile range
Measurements and Main Results: vaginal uterine morcellation, and evacuation of intact fetus

Interventions: Total laparoscopic hysterectomy, bilateral salpingectomy, and adnexectomy. A robotic approach to hysterectomy, with possible conversion to open abdominal hysterectomy. To determine if laparoscopic approach to gravid hysterectomy for benign indications without any preexisting gastrointestinal disorders, the prescription of a bowel care medication does not significantly affect return of bowel function.

Study Objective: To provide a basic introduction to Laparoendoscopic Single-Site surgery (LESS) for the gynecologist including basic set up, concepts, and tips.

Design: Video submission created.

Setting: The operating room set up and procedure was recorded.

Patients or Participants: One patient involved in all video demonstrated.

Interventions: Laparoendoscopic Single-Site (LESS) Surgery recorded.

Measurements and Main Results: Laparoendoscopic Single-Site (LESS) procedure was recorded.

Conclusion: After reviewing the video presented you will have basic instructions including tips and tricks to performing single-site surgery.

Open Communications 19: Laparoscopy (4:00 PM — 5:00 PM)

A Beginners Guide to Laparoendoscopic Single-Site Surgery (LESS)
Weyenberg L., Lloyd R.P., OB/GYN, Amita St. Francis Hospital, Chicago, IL; OB/GYN, Amita St. Francis Hospital, Evanston, IL
*Corresponding author.

Study Objective: To determine if laparoscopic approach to gravid hysterectomy for placenta accreta is a safe alternative to traditional open abdominal route.

Design: Case report.

Setting: Gynecology operating room.

Patients or Participants: A 36-year-old G3P2002 at 19w0d with history of 2 prior cesarean sections presented with undesired pregnancy and placenta previa with suspected placenta accreta. She was consented for laparoscopic gravid hysterectomy, with possible conversion to open abdominal approach.

Interventions: Total laparoscopic hysterectomy, bilateral salpingectomy, vaginal uterine morcellation, and evacuation of intact fetus

Measurements and Main Results: The patient was taken to the operating room, where double set up was prepared for both laparoscopic and abdominal approach to hysterectomy. Exam under anesthesia revealed a 20-week gravid uterus. She was positioned in low lithotomy position. Five laparoscopic ports were placed. A sacrocolpopexy cup was placed in the vagina to delineate the vaginal fornices; no tip was placed through the cervix due to placenta previa. The operating room table was airplaned side to side to assist uterine manipulation. A bariatric 45 degree laparoscope aided visualization. The hysterectomy was completed in usual fashion with a bipolar sealing device. After the colpotomy was completed, the uterus was placed in a tissue extraction bag. Strings attached to the bag were grasped with a ring forcep placed vaginally, and the bag was delivered through the vagina. The uterus was morcellated in the bag, amniotomy was performed, and the fetus was delivered intact. The vaginal cuff was closed, and cystoscopy performed. Total estimated blood loss was 50 mL. The patient discharged on post-operative day one. Final surgical pathology confirmed placenta accreta.

Conclusion: Laparoscopic gravid hysterectomy is a safe alternative to abdominal approach in the setting of placenta accreta, with decreased blood loss, shorter length of stay, and faster recovery.

Open Communications 19: Laparoscopy (4:00 PM — 5:00 PM)

A Novel Technique to Facilitate Fertility-Sparing Laparoscopic Ovarian Cystectomy for a 27 Centimetre Ovarian Cyst
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*Corresponding author.

Study Objective: Demonstration of a novel technique to facilitate fertility-sparing laparoscopic ovarian cystectomy for a 27 centimetre (cm) ovarian cyst – avoiding laparotomy whilst still maintaining oncogenic hygiene.

Design: Surgical video detailing the steps of laparoscopic drainage and excision of a large ovarian cyst.

Setting: Surgery was undertaken by a gyna-oncology consultant with one surgical assistant. The patient was positioned in modified Lloyd-Davis – with table height and stack adjusted for optimal ergonomics.

Patients or Participants: A 35 year old nulliparous patient presented with abdominal pain and a 27cm homogenous left ovarian cyst on imaging. The patient had normal tumour markers and a risk of malignancy index score (RMI) of less than 250.Suspicion for malignancy was low. The patient was otherwise fit and well, had undergone no previous surgery and had a normal body mass index (BMI).

Interventions: Following Hassan entry, initial exploratory laparoscopy confirmed a simple ovarian cyst, with no features concerning for malignancy. A balloon port was inserted through the skin directly into the cyst capsule and used to anchor the cyst to the anterior abdominal wall – creating a tight seal, with no spillage. Laparoscopic suction was inserted via the port to drain the cyst. Two EndoLoops were subsequently applied to the site of cyst puncture to prevent intra-operative leakage of residual content. Ovarian cystectomy was subsequently performed, aided by Bipolar energy for haemostasis. The ovarian cyst capsule was retrieved intact using a specimen bag removed via the 1.5 cm suprapubic port site - preserving oncogenic hygiene.

Measurements and Main Results: No intra or post-operative complications occurred. Histopathology confirmed a benign serous cystadenoma.

Conclusion: This video demonstrates the safety of laparoscopy in the fertility sparing management of a large ovarian cyst whilst maintaining oncogenic hygiene throughout.

Open Communications 19: Laparoscopy (4:00 PM — 5:00 PM)

A Simple Predictive Score for Pre-Operative Adnexal Torsion Diagnosis
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*Corresponding author.

Study Objective: To determine the clinical utility of a simple score to predict pre-operative adnexal torsion.

Design: Retrospective case series.

Setting: Obstetrics and Gynecology, Sheba Medical Center, Ramat-Gan, Israel.

Patients or Participants: A simple score to predict pre-operative adnexal torsion.

Interventions: A simple score to predict pre-operative adnexal torsion.

Measurements and Main Results: The score includes age, complaint duration, physical examination findings, and imaging results. The score ranges from 0 to 5, with a score of 3 or higher indicating a high likelihood of pre-operative adnexal torsion.

Conclusion: The simple score is a useful tool to predict pre-operative adnexal torsion and guide management decisions.

Open Communications 19: Laparoscopy (4:00 PM — 5:00 PM)

4:36 PM

A Simple Predictive Score for Pre-Operative Adnexal Torsion Diagnosis
Meller N., Meyer R., Cohen S., Cohen A., Abu-Bandora E., Komem D., Levin G., Obstetrics and Gynecology, Sheba Medical Center, Ramat-Gan, Israel; Department of Obstetrics and Gynecology, Sheba Medical Center, Tel-Hashomer, Ramat-Gan, Israel; Hadassah Medical Center, Jerusalem, Israel; Tel-Aviv University, Tel-Aviv, Israel; Obstetrics and Gynecology, Hadassah Medical Center, Naule, Israel
*Corresponding author.
Study Objective: To develop a predictive score for pre-operative adnexal torsion diagnosis.

Design: A retrospective cohort study between 2011 and 2020.

Setting: A tertiary, university affiliated medical center.

Patients or Participants: Overall, 546 women with 615 separate episodes of suspected adnexal torsion.

Interventions: Diagnostic laparoscopy.

Measurements and Main Results: We collected clinical characteristics, sonographic findings and laboratory results of suspected adnexal torsion episodes. We compared those who had adnexal torsion confirmed in laparoscopy (72%) and those who had adnexal torsion ruled out (28%).

Pregnancy and assisted reproductive technology treatments were more common in the confirmed torsion group [OR 95% CI 2.3(1.46-3.71), P = 0.001].

On ultrasound scan, an enlarged ovary [OR 95% CI 2.36(1.62-3.44), P <0.001], a higher maximal diameter of affected adnexa (P <0.01) and absent doppler flow [OR 95% CI 1.83(1.01-3.30) P=0.04] were more common in the confirmed torsion group.

Neutrophils to Lymphocytes ratio (NLR) above 3.5 was more common in the confirmed torsion group [OR 95% CI 2.09 (1.42-3.07) P<0.001].

On multivariate regression analysis, vomiting, NLR>3.5 and enlarged ovary finding in ultrasound scan were independently associated with adnexal torsion [OR 95% CI 2.78(1.21-6.36), 3.15(1.42-6.97) and 2.80 (1.33-5.88) respectively]. Considering a basal rate of 50% for adnexal torsion [OR 95% CI 2.09 (1.42-3.07), P<0.001], a higher maximal diameter of affected adnexa (P<0.01) and absent doppler flow [OR 95% CI 1.83(1.01-3.30) P=0.04] were more common in the confirmed torsion group.

Conclusion: Our predictive score may improve pre-operative adnexal torsion diagnosis and reduce rates of unnecessary laparoscopies.

Open Communications 19: Laparoscopy

4:00 PM — 5:00 PM

4:42 PM

A Retrospective Study on the Impact of Transversus Abdominis Plane Block on Pain Management after Laparoscopic Hysterectomy

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*Corresponding author.

Study Objective: To investigate the impact of transversus abdominis plane (TAP) blocks on postoperative pain management after laparoscopic hysterectomy.

Design: A retrospective cohort study.

Setting: An academic medical center.

Patients or Participants: All women who underwent laparoscopic or robotic-assisted hysterectomy at a single institution.

Interventions: Anesthesia delivered TAP block administered in the operating room immediately following laparoscopic hysterectomy between 2018 and 2020.

Measurements and Main Results: In our initial analysis, we included 115 women who underwent laparoscopic or robotic-assisted hysterectomy. Thirty patients (26%) received a postoperative TAP block and 85 patients (74%) did not receive a TAP block. Demographics, preoperative, and intraoperative variables were similar between the two groups. However, the TAP block group received significantly more intraoperative morphine milliequivalents (MMEs) (75 MMEs versus 60 MMEs, p=0.008) and less local anesthetic administered at the skin incisions and the cervix (p<0.0001). There was no difference between groups in postoperative ketorolac, ibuprofen, or acetaminophen. Our primary outcome of postoperative opioids administered was not significantly different between groups [28.8 MME vs 22.5 MME, p=0.85]. The first recovery room pain score and the highest recovery room pain score were also similar between the two groups. There was no difference in length of stay or postoperative emergency department visits and urgent care visits for postoperative pain between groups.

Conclusion: Our preliminary results do not show a significant reduction in postoperative opioids or recovery room pain scores for patients who received a TAP block compared to those who did not. Our next step will be to increase our sample size, perform a regression analysis, and complete a sub-analysis of patients with chronic pelvic pain.

Open Communications 20: New Instrumentation or Technology

4:00 PM — 5:00 PM

4:00 PM

Fractionated Laser for Vaginal Atrophy Symptoms: A Randomized, Double-Blind Placebo Controlled Study

Li F.G.,1* Deans R.,1 Nesbitt-Hawes E.,2 Budden A.K.,1 McCormack L.,1 Malheux-Lacroix S.,1 Segelov E.,1 Lyons S.D.,1 Abbott J.A.1,2* School of Women’s and Children’s Health, University of New South Wales, Sydney, NSW, Australia; 3Monash University, Melbourne, VIC, Australia

*Corresponding author.

Study Objective: To investigate fractionated carbon dioxide (CO2) laser treatment in treatment post-menopausal vaginal atrophy symptoms.

Design: A randomized, double-blind, placebo controlled trial.

Setting: A university-affiliated tertiary care hospital.

Patients or Participants: Participants were postmenopausal women experiencing vulvovaginal symptoms who were contraindicated to or had an ineffective trial of topical hormonal and non-hormonal vaginal therapy.

Interventions: Participants underwent 3 treatments, each 4-8 weeks apart of either fractionated micro-ablative CO2 laser treatment at recommended or placebo settings. Both groups had an identical clinical experience. Third party telephone randomization and separate assessment and treatment teams maintained blinding. We assessed the Vaginal Health Index (VHI), collected paired pre- and post-treatment vaginal histopathology and cytology, evaluated self-reported symptom severity by visual analogue scale (VAS) of most bothersome symptom, and impact on livelihood, quality of life and sexual function from baseline to post-treatment as an indicator of treatment efficacy.

Measurements and Main Results: 232 women were pre-screened, 90 consented, 85 randomized, 83 completed 6-month follow-up and 78 completed 12-month follow-up. Mean age was 57 (range: 30-77). There was no significant difference in severity of the VAS score of the most bothersome symptom between placebo and intervention groups post-treatment (VAS scores: 57.4, 49.4; p=0.22). There was a significant reduction in mean from baseline to 6-months in both the placebo group (21.0; p<0.001) and intervention group (33.2; p<0.001), demonstrating a placebo effect. There were no statistically significant differences in vaginal dryness and dyspareunia between groups at baseline and 6-months. There was no statistically significant difference in VHI scores between or within the placebo and intervention groups at baseline or 6-month follow-up.

Conclusion: This first placebo-controlled RCT reports no statistically significant differences in any parameter between placebo and intervention groups using fractionated CO2 laser for postmenopausal vaginal atrophy symptoms. Based on our findings, clinical use of this technology cannot be recommended for this indication.
Open Communications 20: New Instrumentation or Technology
(4:00 PM — 5:00 PM)

4:06 PM

Introduction of the Operating Room Black Box in Gynecology: Development of a Procedural Framework for Total Laparoscopic Hysterectomy

Nensi A., 1* Schulthess P., 2* McLoone M., 3* Elkabany S., 3* Najafi M., 5 Bohnen J., 3* Palter V., 3* Grantcharov T.P., 3, 5* Shore E.M., 8* Obstetrics and Gynecology, St. Michael’s Hospital, University of Toronto, Toronto, ON, Canada; 2Department of Anesthesia, St. Michael’s Hospital, Toronto, ON, Canada; 3Department of Obstetrics and Gynecology, St. Michael’s Hospital, Toronto, ON, Canada; 4Li Ka Shing Knowledge Institute, St. Michael’s Hospital, International Centre for Surgical Safety, Toronto, ON, Canada; 5Li Ka Shing Knowledge Institute, St Michael’s Hospital, International Centre for Surgical Safety, Toronto, ON, Canada; 6Department of Surgery, St. Michael’s Hospital, University of Toronto, Toronto, ON, Canada; 7Department of Obstetrics and Gynecology, St. Michael’s Hospital, University of Toronto, Toronto, ON, Canada

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Study Objective: Operating room (OR) delays due to inefficiency can result from a chain of intraoperative events including technical factors, equipment failures or unavailability, and non-technical human factors. The newly developed Operating Room Black Box (ORBB) technology can be used to capture information during surgery which can be analyzed to potentially identify the root causes of delays and inefficiencies. We aimed to develop a procedural framework for total laparoscopic hysterectomy (TLH) in order to accurately and consistently capture the essential time points that occur during this complex laparoscopic procedure.

Design: Multi-disciplinary collaborative working group.

Setting: Canadian tertiary care academic hospital.

Patients or Participants: Team consisted of gynecologic surgeons, an anesthetist, an OR nurse and systems analysts.

Interventions: Multi-disciplinary working group collaborated to develop a procedural framework encompassing the critical steps and check points occurring during the course of a TLH. All phases of the operation were considered including pre-operative, intra-operative, and post-operative steps.

Measurements and Main Results: The completed framework consists of a series of procedural steps divided into three time phases: pre-operative, intra-operative and post-operative. Consensus from the group led to the identification of 7 discrete steps during the pre-operative phase, 11 intra-operative steps and 6 post-operative steps.

Conclusion: The development of a standardized procedural framework for TLH is the first step towards capturing data with the ORBB technology. The analysis of the captured data will allow us to analyze the non-technical factors. The newly developed Operating Room Black Box in Gynecology: Development of a Procedural Framework for Total Laparoscopic Hysterectomy (TLH) is the first step towards capturing data with the ORBB technology. The completed framework consists of a series of procedural steps divided into three time phases: pre-operative, intra-operative and post-operative. Consensus of the group led to the identification of 7 discrete steps during the pre-operative phase, 11 intra-operative steps and 6 post-operative steps.

Conclusion: The developed framework is a multi-disciplinary operating room “playbook” that can be utilized to minimize time delays and maximize OR utilization.

Open Communications 20: New Instrumentation or Technology
(4:00 PM — 5:00 PM)

4:12 PM

Using Black Box Technology to Identify and Describe Intraoperative Delays, Distractions and Threats in the Gynecology OR: A Pilot Study

Nensi A., 1* Schulthess P., 2* McLoone M., 3* Elkabany S., 3* Najafi M., 5 Bohnen J., 3* Palter V., 3* Grantcharov T.P., 3, 5* Shore E.M., 8* Obstetrics and Gynecology, St. Michael’s Hospital, Toronto, ON, Canada; 2Department of Anesthesia, St. Michael’s Hospital, University of Toronto, Toronto, ON, Canada; 3Department of Obstetrics and Gynecology, St. Michael’s Hospital, Toronto, ON, Canada; 4Li Ka Shing Knowledge Institute, St. Michael’s Hospital, International Centre for Surgical Safety, Toronto, ON, Canada; 5Li Ka Shing Knowledge Institute, St Michael’s Hospital, International Centre for Surgical Safety, Toronto, ON, Canada; 6Department of Surgery, St. Michael’s Hospital, University of Toronto, Toronto, ON, Canada;

*Corresponding author.

Study Objective: To determine if participants’ self-reported confidence level with performing a laparoscopic gynecologic surgical task was higher after training with a gynecology-specific laparoscopic trainer.

Design: Randomized controlled trial incorporating block randomization and a masked design.

Setting: Participants were trained and tested during a four-hour session in the Northwestern Center for Advanced Surgical Education simulation lab.
Patients or Participants: 45 surgically naïve premedical and preclinical medical students were recruited from June-November 2019.

Interventions: Participants were randomized into two laparoscopic simulator groups — Essentials in Minimally Invasive Gynecology (EMIG) or Fundamentals of Laparoscopic Surgery (FLS) — then underwent training on relevant simulation tasks for 2.5 hours (including peg transfer and intracorporeal knot tying).

Measurements and Main Results: Participants completed a video-recorded pre-test and post-test on a laparoscopic vaginal cuff suturing model. Videos were masked then graded using a modified version of the Global Operative Assessment of Laparoscopic Skills (GOALS) tool by high-volume minimally invasive gynecologic surgeons. Participants were not aware of their GOALS scores. All participants completed a survey at the conclusion of the session, rating their confidence level during each laparoscopic simulation task on a 5-point Likert scale. Confidence scores were compared using two sample t-tests with unequal variances. No statistically significant differences in confidence levels were noted between EMIG and FLS participants: peg transfer (diff=0.03, p=0.88), intracorporeal knot tying (diff=0.15, p=0.55) and vaginal cuff suturing (diff=0.41, p=0.11).

Conclusion: Neither EMIG participants nor FLS participants had higher self-rated confidence scores for the simulator tasks or the vaginal cuff suturing task with regard to statistical significance. However, when examining the raw data, confidence scores for all three tasks were higher for EMIG participants than FLS participants. These results suggest that EMIG-randomized participants may have felt better prepared to complete a laparoscopic gynecologic surgical task; however, larger studies are needed to demonstrate this conclusively.

Open Communications 20: New Instrumentation or Technology (4:00 PM — 5:00 PM)

4:24 PM

Application of vNOTES in a Training Setting
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*Corresponding author.

Study Objective: To demonstrate application of vaginal natural orifice transluminal endoscopic surgery (vNOTES) in a training setting.

Design: A single tertiary care academic institution.

Setting: At time of vaginal hysterectomy.

Patients or Participants: All patients undergoing total vaginal hysterectomy.

Interventions: Introduction of vNOTES including instruments, tips and tricks on how to apply this technique in a training setting.

Measurements and Main Results: Completion of vaginal natural orifice surgery.

Conclusion: Understanding basic techniques of vaginal natural orifice surgery can help trainees and young physicians become more comfortable with vaginal surgery.

Open Communications 20: New Instrumentation or Technology (4:00 PM — 5:00 PM)

4:30 PM

Transvaginal Natural Orifice Transluminal Endoscopic Surgery with a Self-Constructed Pessary Port
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Study Objective: To describe a low-cost self-constructed pessary port for Transvaginal Natural Orifice Transluminal Endoscopic Surgery (vNOTES) and to demonstrate the feasibility of several procedures using the port.

Design: Description of the port and demonstration of its clinical applications using surgical video footage.

Setting: A tertiary university hospital.

Patients or Participants: 2 patients with gender identity disorder, 1 patient with pelvic organ prolapse, 1 patient with tubal ectopic pregnancy, 1 patient with dermoid cyst, 1 patient with type 6 myoma.

Interventions: A patient with gender identity disorder underwent vNOTES bilateral salpingo-oophorectomy following vaginal hysterec-tomy. A patient with gender identity disorder underwent vNOTES assisted vaginal hysterec-tomy due to difficulty during conventional vaginal hysterectomy because of increased uterine size related to fibroids. A patient with pelvic organ prolapse underwent high uterosacral ligament suspension following vaginal hysterectomy. A patient with tubal ectopic pregnancy underwent unilateral salpingectomy. A patient with a 5-cm dermoid cyst underwent ovarian cystectomy. A patient with a 5.5-cm type 6 myoma underwent myomectomy.

Measurements and Main Results: N/A

Conclusion: vNOTES is a new form minimally of invasive surgery which has been gaining momentum through the last decade. However, it would not be wrong to say that it is still not widespread. This fact may stem from the belief that special equipment designed exclusively for vNOTES is required to perform vNOTES procedures. The port described in this video can be easily built using a ring pessary, and basic equipment available in almost every operating room. As demonstrated in the video, a variety of gynecological surgeries can be carried out using the port with the existing laparoscopic setting. This video may aid vNOTES in getting more exposure as it describes a low-cost, effective and highly available tool suitable for most of the common gynecological procedures.

Open Communications 20: New Instrumentation or Technology (4:00 PM — 5:00 PM)

4:36 PM

Pre-Surgical Planning Using Patient-Specific 3D Printed Anatomical Models for Women with Uterine Fibroids

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Study Objective: To evaluate the effect of using patient specific 3D printed anatomical models in pre-surgical planning for patients with uterine fibroids.

Design: Repeated measures questionnaire study.

Setting: Tertiary academic hospital.

Patients or Participants: Minimally invasive gynecologic surgeons.

Interventions: Surgeons completed a questionnaire documenting their surgical plan, perceived surgical difficulty, and confidence in surgical approach before and after receiving a patient specific 3D printed model derived from standard of care pelvic MRI. 3D models had uterine fibroids printed in opaque magenta, endometrium in cyan, and non-neoplastic anatomy (myometrium and cervix) was printed as clear resin to maximize visualisation of underlying lesions. A post-operative questionnaire rated the surgeons’ experience using the 3D models.
Measurements and Main Results: Five surgeries (4 open myomectomy; 1 laparoscopic hysterectomy) were completed. One staff surgeon and one/two surgical fellow(s) participated in each case (N=11). After viewing the models, perceived surgical difficulty increased in 5, decreased in 1, and did not change in 5 surgeon responses. The average allotted surgical time changed by 50mins and anticipated blood loss by 120cc. Anticipated intra-operative complications changed in 7/11 plans corresponding with a change in planned hemostatic techniques to be used in 6/11 plans. Increased confidence in planned approach was reported in 7/11 surgeon responses. Intra-operative reference changed corresponding with a change in planned hemostatic techniques to be used in 6/11 plans. Increased confidence in planned approach was reported in 7/11 surgeon responses.

Conclusion: The use of patient specific 3D printed models altered the surgeons’ perception of surgical difficulty, planned hemostatic techniques, and perceived risk for surgical complications when creating their pre-operative plan. By increasing their understanding of complex anatomy, surgeons reported greater confidence in their pre-operative plan when using 3D models, thus optimizing surgical decision making and improve patient outcomes.

Open Communications 20: New Instrumentation or Technology (4:00 PM — 5:00 PM)

4:42 PM
Ultrasound-Guided Polypectomy: Evaluation of a Novel Technique to Remove Endometrial Polyp in the Office
Sarkar P.*, Hochberg L. Obgyn, University of South Florida, Tampa, FL *Corresponding author.

Study Objective: To demonstrate a novel technique of office-based polypectomy using universal grasping device under transabdominal ultrasound guidance.

Design: Stepwise demonstration of ultrasound guided polypectomy with narrated video footage.

Setting: Academic tertiary care Hospital.

Patients or Participants: 43-year-old female with abnormal uterine bleeding secondary to endometrial polyp (20 x 11 x 16 mm) for 3 months

Interventions: Saline infusion sonogram (SIS) was used to delineate the polyp. Then using the universal grasping forceps (2.5 mm x 25 cm), which was introduced through the cervix into the uterus, the polyp was removed in multiple attempts.

Measurements and Main Results: Complete removal of polyp as confirmed by follow up transvaginal ultrasound after 2 months. Complete resolution of patient’s symptoms.

Conclusion: During the time of COVID 19 global pandemic, this technique can be used safely and effectively to remove endometrial polyp in the right patient population, hence decreasing the burden of OR procedures.

Open Communications 21: Laparoscopy (4:00 PM — 5:00 PM)

4:00 PM
Incidence of and Risk Factors Associated with Postoperative Venous Thromboembolism in Hysterectomy for Benign Indications
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Study Objective: To identify the incidence of venous thromboembolism (VTE) and its modifiable risk factors after hysterectomy for benign conditions.

Design: Retrospective cohort.

Setting: American College of Surgeons’ National Surgical Quality Improvement Program (ACS-NSQIP) 2014 to 2018 Participant Use Data Files.


Interventions: Hysterectomy cases were stratified by approach (abdominal, laparoscopic, or vaginal). Outcomes were VTE, including deep vein thrombosis or pulmonary embolism. Patient demographics, preoperative comorbidities, American Society of Anesthesiologists (ASA) classification system scores, operative time, length of stay, surgeon subspecialty, readmission, and reoperation were also collected. The student t-test, X² and Fisher exact tests were used for univariate analysis where appropriate; multivariable logistic regression models were also performed.

Measurements and Main Results: We identified 92,272 cases during the study period, of which 23,388 (25.3%) were abdominal hysterectomies (AH), 53,968 (58.5%) were laparoscopic hysterectomies (LH), and 14,916 (16.2%) were vaginal hysterectomies (VH). The overall incidence of VTE was 0.4%. The incidence of VTE was 0.7% in AH, 0.3% in LH, and 0.2% in VH (p<0.001). In a multivariable logistic regression model controlling for age, race, BMI, smoking status, ASA class and route of surgery, LH and VH were associated with a lower odds of postoperative VTE (aOR 0.48, 95%CI 0.38-0.60 and aOR 0.31, 95%CI 0.20-0.46, respectively) while ASA class 4 (aOR 4.3; 95%CI 1.93-9.19) and total operative time >130 minutes (aOR 1.71, 95%CI 1.38-2.14) were independently associated with an increased odds of postoperative VTE.

Conclusion: The incidence of postoperative VTE after hysterectomy for benign indications was low. The adjusted odds of VTE was higher in patients undergoing abdominal hysterectomy when compared to laparoscopic and vaginal approaches. Surgeons should consider a minimally invasive approach for hysterectomy for benign conditions when feasible to decrease the risk of postoperative VTE.

Open Communications 21: Laparoscopy (4:00 PM — 5:00 PM)

4:06 PM
A Safe Technique of Laparoscopic Tissue Extraction for a 1kg Uterus Using an Insufflated Bag
Mercky J.*. Gynecology, Hôpital de St-Eustache, Montreal, QC, Canada *Corresponding author.

Study Objective: Tackle the challenges of large specimen extraction in minimally invasive gynecologic surgery.

Design: We describe the use of an insufflated bag during a total laparoscopic hysterectomy (TLH) for a 1kg uterus.

Setting: TLH for a large uterus, patient in Trendelenburg position, 4 trocars inserted, incision at the Palmer point.

Patients or Participants: 39 year old G1P1 patient (1 cesarean-section), with a body mass index of 28, and a 15 cm uterus causing abdominal pain.

Interventions: TLH and bilateral salpingectomy, power morcellation contained in a 50cmx50cm plastic bag, insufflated in the abdomen, under direct vision.

Measurements and Main Results: Estimated blood loss of 100ml, no visible fibroid tissue left in the abdomen, post-operative day 1 hemoglobin of 126 g/L, patient discharged on post-operative day 1. Operative time of 90 minutes.

Conclusion: We describe a safe and effective technique to extract a large specimen by laparoscopy using a plastic bag insufflated in the abdomen.
Open Communications 21: Laparoscopy
(4:00 PM — 5:00 PM)

4:12 PM

Perioperative Opioid Requirements in Minimally Invasive Gynecologic Surgery
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Study Objective: To evaluate postoperative opioid use and the impact of a patient educational intervention regarding the opioid epidemic and proper opioid use/disposal after benign MIGS procedures.

Design: Prospective Cohort Study

Setting: Academic hospital center

Patients or Participants: Adult patients undergoing benign MIGS procedures were enrolled 1/1/2019–1/1/2020. Exclusion criteria: conversion to laparotomy, preoperative opioid use, incapable of written informed consent, non-English speaking.

Interventions: Educational pamphlets were provided preoperatively. Patients underwent hysterectomy (HYS), myomectomy (MYO), or other laparoscopic (LSC) procedures. Opioid prescriptions were standardized with 25 tablets oxycodone 5mg for HYS/MYO, 10 tablets oxycodone 5mg for LSC (oral morphine equivalents [OME] were maintained for alternative options). Pill diaries were reviewed and patient surveys completed during postoperative visits.

Measurements and Main Results: Of 106 consented patients, 65 (61%) completed their pill diaries (36 HYS, 17 MYO, 12 LSC). Median opioid use was 35 OME for HYS (~5 oxycodone tablets; IQR 11.25-102.5), 30 OME for MYO (~4 tablets; IQR 15-75), and 18.75 OME for LSC (~3 tablets; IQR 7.5-48.75). Median last post-operative day (d) of use was 3d for HYS (IQR 2, 8), 4d for MYO (IQR 1, 7), and 2d for LSC (IQR 0.5-3.5). One patient (MYO) required a refill of 5mg oxycodone (10 tablets). No difference was found between total opioid use and presence of pelvic pain, chronic pain disorders, or psychiatric co-morbidities. Overall satisfaction with pain control (≥4 on a 5-point Likert scale) was 91% for HYS, 100% for MYO, 83% for LSC. Of the 33 patients who read the pamphlet, 32 (97%) felt it increased their awareness/knowledge.

Conclusion: The vast majority of patients required <10 oxycodone 5mg tablets regardless of surgery type with excellent patient satisfaction. A patient education pamphlet can be a simple method to increase awareness regarding the opioid epidemic and facilitate proper disposal of opioid medications.

Open Communications 21: Laparoscopy
(4:00 PM — 5:00 PM)

4:18 PM

A How-to Guide: Suture Ligature Appendectomy
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Study Objective: This video is intended to review the relevant anatomy and procedural steps to a suture ligature appendectomy. We will also review the safety data on the use of staplers and mechanical devices as compared to suture ligatures.

Design: Instructional educational video.

Setting: Academic medical center.

Patients or Participants: This video describes the case of a patient with appendiceal endometriosis.

Interventions: The patient underwent a suture ligature appendectomy due to involvement of the appendix in ovarian fossa endometriosis.

Measurements and Main Results: A Cochrane review published in 2017 showed no difference in total, intraoperative, or postoperative complications between suture ligation and any type of mechanical device, including staplers, clips, or electrocautery devices. In addition, mechanical devices cost at least three-fold more than suture ligature-based methods but saved only 9 minutes of OR time.

Conclusion: A suture-ligation approach to appendectomy is a safe, low-cost, and simple intervention.

Open Communications 21: Laparoscopy
(4:00 PM — 5:00 PM)

4:24 PM

Association between Obesity and Surgical Outcomes for Minimally Invasive Hysterectomy
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Study Objective: To investigate the morbidity associated with minimal invasive hysterectomy in obese women.

Design: This is a retrospective cohort study. The National Surgical Quality Improvement Project database from 2014 to 2017 was queried for all women who underwent laparoscopic, robotic or vaginal hysterectomy. Our primary outcome was the composite morbidity (including surgical site infection, pulmonary, sepsis, thromboembolic, cardiac and renal complications). Our secondary outcomes included length of stay, readmission, reoperation and surgical complications. A multivariable logistic regression adjusting for Age, Race, ASA, smoking, surgical approach and operation time was performed.

Setting: Hospitals participating in the program.

Patients or Participants: Patients undergoing minimally invasive hysterectomy for benign disease excluding urogynecologic, cancer or additional procedures.

Interventions: N/A

Measurements and Main Results: 39,368 (36.8%) hysterectomies were analyzed including 18,767 (47.8%) obese and 20,501 (52.2%) non-obese women. Obesity was associated with increased risk for the primary outcome compared to nonobese women (2.9% vs 2.2%, aOR 1.27, 95% CI 1.12-1.45). When assessing the different components of the primary outcome compared to nonobese women (2.9% vs 2.2%, aOR 1.27, 95% CI 1.12-1.45). When assessing the different components of the primary outcome, obesity was associated with increased risk for superficial site infection compared to nonobese women (1.0% vs. 0.6%, aOR 1.63, 95% CI 1.29-2.06) and there was no difference in the risk of the other surgical morbidity.

Obesity was associated with increased risk for length of stay > 2 days (2.8% vs 2.4%, p<0.01) compared to nonobese women. There was no difference in the rate of ureteral/bladder/bowel injury, urinary tract infection, blood transfusion, readmission, surgical site closure or reoperation between obese and nonobese women.

Conclusion: The rate of surgical morbidity in obese women undergoing minimally invasive hysterectomy is low but remains significantly higher than that of nonobese women. It is mainly driven by the superficial wound infection rate. Future interventions such as specific wound care interventions in obese patients could be explored to minimize that risk.
Open Communications 21: Laparoscopy (4:00 PM — 5:00 PM)

4:30 PM

Complications Following Total Laparoscopic Hysterectomies: A Cohort Study Analyzing One Vs. Two-Layer Laparoscopic Vaginal Cuff Closure
Ali R., 1 Peters A., 2, 3, 4 Foley C.E., 2 Miles S., 5 Buffie A. 2, Mansurova S.M. 7
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Study Objective: To determine whether two-layer laparoscopic vaginal cuff closure during laparoscopic hysterectomies is associated with lower postoperative complications compared to standard one-layer closure.

Design: Retrospective cohort study.

Setting: Academic tertiary care center.

Patients or Participants: 2,973 patients.

Interventions: During a 6-year period, 1,760 (59.2%) and 1,213 (40.8%) patients underwent single (1-LVC) vs. two-layer (2-LVC) laparoscopic vaginal cuff closure, respectively. Factors influencing laparoscopic vaginal cuff complications including age, postmenopausal status, body mass index, tobacco use, immunosuppressant medications, and sexual activity were recorded. We compared total postoperative complications including visceral injury, blood transfusion, hematoma, thromboembolism, infection, and cuff complications. The latter were further examined for cuff dehiscence, mucosal separation, hematoma, cellulitis/abscess, granulation tissue and persistent vaginal bleeding. Statistical analyses included Chi-square and Wilcoxon rank sum testing.

Measurements and Main Results: 2-LVC closure was associated with decreased total postoperative complications (2-LVC: 3.38% vs. 1-LVC: 5.57%; p = 0.006) without impacting intraoperative complications (1.40% vs. 1.25%; p = 0.721) or emergency room/hospital readmissions (11.05% vs. 12.67%; p = 0.181). 2.44% of 1-LVC patients experienced postoperative cuff complications compared to only 0.74% women in the 2-LVC group (p = 0.002). No subjects in the 2-LVC cohort experienced a vaginal cuff dehiscence or mucosal separation compared to 0.63% and 0.23% of patients in the 1-LVC group, respectively. Granulation tissue (1-LVC: 0.40% vs. 2-LVC: 0.16%), persistent vaginal bleeding (0.57% vs. 0.16%), and cuff cellulitis (0.51% vs. 0.33%) were also more common in the 1-LVC cohort. Univariate analysis of total postoperative cuff complications revealed that a 2-LVC closure was protective of postoperative complications (OR = 0.37, 95% CI: 0.188-0.712).

Conclusion: Although postoperative problems linked to laparoscopic hysterectomies are already exceptionally low, the added use of a 2-LVC closure further lowers postoperative total and vaginal cuff complications.

Open Communications 21: Laparoscopy (4:00 PM — 5:00 PM)

4:36 PM

Views of Safety in Gynecologic Surgery
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Study Objective: The objective of this video is to demonstrate critical views in gynecologic surgery with the finality of decreasing inadvertent injury to vascular and genitourinary structures.

Through this video, we will highlight these critical views when the risk of injury to important surrounding anatomic structures is high, and pathology that causes anatomic distortion is present.

Our video emphasizes the importance of achieving these views before proceeding to the next step of the procedure.

Design: In general surgery, the rise of laparoscopic cholecystectomy was associated to a higher incidence of common bile duct injuries when compared to open. This was attributed to the common bile duct being mistakenly identified as the cystic duct. This injury was so common it was named “classical injury”. Subsequently, a “Critical view of safety” was described by identifying key anatomic landmarks and isolating key structures. If these landmarks were not isolated and key structures identified, the procedure would be halted until deemed safe to proceed.

We adapted these concepts of “culture of safety” to gynecologic surgery and identified key anatomic landmarks and structures, in various scenarios, that could prevent genitourinary and vascular injury. The steps to identification and safety views are described in this video.

Setting: Academic medical center.

Patients or Participants: Surgical footage.

Interventions: Establish critical views in gynecologic surgery.

Measurements and Main Results: N/A

Conclusion: Critical views have been used in the field of General Surgery to minimize injury to the common bile duct during laparoscopic cholecystectomy, with observational literature supporting that these critical views have led to a decrease in inadvertent injury. Our goal with this video is to adopt this concept of “culture of safety” to gynecologic surgery by identifying views of safety that can minimize operative complications.

A Purse-String Approach to Laparoscopic Cornuostomy for Intertitial Ectopic Pregnancy
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Study Objective: To review surgical techniques for tissue dissection in interstitial ectopic pregnancies, and demonstrate a novel approach to resection using a purse-string suture for improved hemostasis and minimized surgical morbidity.

Design: Brief literature review, clinical history, and video documentation.

Setting: The patients were both placed in a dorsal lithotomy position for laparoscopy in a tertiary care centre.

Patients or Participants: The two patients selected for inclusion in the video were chosen based upon confirmation of diagnosis of interstitial ectopic pregnancy, and primary surgeon at time of OR for operative consistency. Patient 1 was a 36-year old G3P1 woman who presented with bleeding at 8 weeks 5 days gestational age. Patient 2 was a 35 year-old G2P1 woman who presented with abdominal pain at 11 weeks gestational age, with additional risk factors for surgical complications.

Interventions: Laparoscopic cornuostomy for interstitial ectopic pregnancy

Measurements and Main Results: Pre-operatively, both diagnoses were confirmed with serial ultrasound. Findings at time of laparoscopy supported the above, with clear distention at the uterine cornea without normal endometrial implantation

Our video demonstrates a four-step approach to resection of such pregnancies through laparoscopic cornuostomy. This includes isolating the
pregnancy by salpingectomy and ligation of the utero-ovarian ligament, ensuring hemostasis with a novel purse string suture around the pregnancy at its equatorial line and injection of vasopressin, resection using a linear incision, and a layered repair of the uterine defect.

**Conclusion:** Although rare, interstitial ectopic pregnancies present a distinct surgical challenge, as they often present with rupture and carry a significant risk of hemorrhage at time of resection. The purse string suture is a useful tool in minimizing bleeding, and allows for interstitial ectopic pregnancies to be excised with a minimally invasive cornuostomy, even in cases of significant anatomical distortion.

**Open Communications 21: Laparoscopy (4:00 PM — 5:00 PM)**

**4:48 PM**

**Three Original Methods of Laparoscopic Colpopoiesis from the Pelvic Peritoneum. Tactics Selection and Results of Treatment**

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*Corresponding author.

**Study Objective:** To compare results of 3 original techniques of laparoscopically assisted colpopoiesis from pelvic peritoneum.

**Design:** Level II-1, Canadian Taskforce.

**Setting:** Department of Operative Gynecology, National Medical Research Center for Obstetrics, Gynecology and Perinatology of the Ministry of Healthcare of Russia

**Patients or Participants:** We recruited 203 patients with utero-vaginal aplasia, gonadal dysgenesis, testicular feminization, congenital adrenogenital disorders, male-to-female transgenders.

**Interventions:** Adamyan’s technique of laparoscopically assisted colpopoiesis from pelvic peritoneum has been used for more than 30 years. Since 2012, we have used three original methods of laparoscopic neovagina creation from pelvic peritoneum: laparoscopic-perineal technique, total laparoscopic technique and combined laparoscopic-perineal technique with ligatures used for bringing down the peritoneum.

**Measurements and Main Results:** Total of 71 patients underwent colpopoiesis using a laparoscopic-perineal technique: in 94 cases - total laparoscopic technique and in 38 - laparoscopic-perineal technique with ligatures were used. 27 patients had history of unsuccessful attempts for surgical neovagina creation. There were no significant differences between three types of colpopoiesis in blood loss, duration of surgery, length of postoperative hospital stay and in use of pain relievers postoperatively. From the standpoint of complications, 1 case of bladder injury, 1 case of rectal injury in patients with previous fibrosis were diagnosed and eliminated during surgery followed by asymptomatic recovery. Postoperative neovaginal stricture was seen in 5 cases and dyspareunia was seen in 11 cases, which improved with vaginal maintenance dilation within 1 month.

**Conclusion:** Laparoscopy involving neovagina creation is an effective and safe operation even in patients with unsuccessful previous neovagina attempts and radiation induced fibrosis, which provides sufficient length of neovagina of 10-12 cm, functional aspects such as lubrication, epithelialization, extensibility and sensibility. However, such interventions especially in complex cases should be provided in the specialized medical centers.

**Open Communications 22: Reproductive Medicine (4:00 PM — 5:00 PM)**

**4:00 PM**

**Robotic Assisted Laparoscopic Repair with Acell Extracellular Matrix Reinforcement of Recurrent Trans-Mural Isthmocoele**

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**Study Objective:** To illustrate the use of robotic surgery in repairing a recurrent trans-mural isthmocoele using Acell extracellular matrix as reinforcement following treatment of a cesarean scar ectopic pregnancy.

**Design:** N/A

**Setting:** 36 year old G4P1031 with a history of cesarean scar ectopic managed with intramuscular and intragestational sac methotrexate presented with a full thickness transmural isthmocoele. She underwent a robotic assisted laparoscopic repair of the isthmocoele. Office hysteroscopy following the surgery demonstrated resolution of the uterine defect. A recurrence of the full thickness defect in the anterior uterine wall resulting in a diverticulum was noted on hystosalpingogram and confirmed with pelvic MRI during her infertility workup.

**Patients or Participants:** N/A

**Interventions:** Patient underwent a combined hysteroscopic guided via transillumination and robotic assisted laparoscopic trans-mural isthmocoele repair with Acell extracellular matrix reinforcement.

**Measurements and Main Results:** N/A

**Conclusion:** The initial cesarean scar ectopic pregnancy was treated with methotrexate with trans-mural isthmocoele as a sequela. Without a clearly defined gold standard in the literature for repairing recurrent trans-mural isthmocoele, laparoscopy provides a minimally invasive approach. However, the recurrence rate of isthmocoele following laparoscopic repair is unknown. Acell extracellular matrix has been used for other gynecologic procedures because of its ability to optimize the strength of the repair where scarring would be expected by promoting and facilitating the body’s ability to remodel functional native tissue while minimizing the risk of foreign body response. The use of Acell in robotic assisted laparoscopic application for the reinforcement of isthmocoele repair has not been previously described.

**Open Communications 22: Reproductive Medicine (4:00 PM — 5:00 PM)**

**4:06 PM**

**Laparoscopic Management of an Interstitial Ectopic Pregnancy**

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**Study Objective:** An interstitial ectopic pregnancy, also known as a cornual ectopic pregnancy, is rare form of tubal ectopic pregnancy and is associated with high maternal mortality (2-2.5%). The objective of this film is to review the epidemiology, presentation, diagnosis and management of an interstitial ectopic pregnancy.
Design: This is a case report of a patient who presented with an interstitial ectopic pregnancy.

Setting: The preoperative, intraoperative and postoperative course took place at a center for minimally invasive gynecologic surgery. The surgery was performed with the patient in dorsal lithotomy position.

Patients or Participants: N/A

Interventions: In this film, we review the specific technique for performing a laparoscopic cornual wedge resection with a laparoscopic ultrasonic dissector and removal of the specimen through a laparoscopic specimen retrieval bag. We also identify surgical principles for reducing intraoperative blood loss and improving patient outcomes. Lastly, we review postoperative and fertility outcomes and expectations.

Measurements and Main Results: Key strategies were employed to minimize intraoperative blood loss including administration of tranexamic acid at the start of the procedure, myometrial infiltration with dilute vasopressin and maintaining view of anatomic landmarks to avoid encountering the utero-ovarian vasculature. The ectopic pregnancy was successfully resected, and the patient’s fertility was preserved.

Conclusion: After watching the film, the viewer should be able to diagnose an interstitial ectopic pregnancy on transvaginal pelvic ultrasound by identifying the “interstitial line sign” and be able to reasonably differentiate it from other forms of ectopic pregnancy. The viewer will understand the management options including both local and systemic methotrexate, as well as surgical options, including laparoscopic cornual wedge resection. The viewer will have a grasp of the surgical principles employed to reduce intraoperative blood loss and the evidence for counseling patients regarding future fertility.

Open Communications 22: Reproductive Medicine
(4:00 PM — 5:00 PM)

4:12 PM

Surgical Management of an Interstitial Ectopic Molar Pregnancy

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Study Objective: The objective of this video is to demonstrate the use of laparoscopic cornuostomy for the removal of an interstitial molar pregnancy.

Design: video demonstrate of laparoscopic cornuostomy for interstitial pregnancy

Setting: N/A

Patients or Participants: The patient is a nulliparous 29 year old who presented for preconception counseling. At her visit, she disclosed having abdominal pain and was found to have a positive urine pregnancy test. Given the complaint in early pregnancy, she was worked up for possible abnormal pregnancy. She had a markedly elevated quantitative beta hCG to over 58 thousand miu/ml and pelvic ultrasound with a multicystic collection at the fundus without a discernible intrauterine gestation. Subsequent MRI was highly suspicious for interstitial ectopic pregnancy and the multicystic appearance in the setting of the markedly elevated quantitative beta hCG increased concern for an interstitial molar pregnancy. After an unsuccessful trial of methotrexate, decision was made to proceed with surgical management.

Interventions: Initial surgical plan was for laparoscopic wedge resection. Intraoperatively, after careful evaluation of the location of the pregnancy, decision was made to perform a laparoscopic cornuostomy to preserve the significant uterine volume that would be lost with wedge resection.

Measurements and Main Results: Laparoscopic cornuostomy was able to effectively remove the abnormal pregnancy tissue as evidenced by a significant drop in quantitative beta hCG (68.4 thousand miu/ml just prior to procedure to 6 thousand miu/ml on postoperative day 2) while maintaining uterine volume and retention of the fallopian tube.

Conclusion: This video demonstrates the feasibility of laparoscopic cornuostomy as an alternative surgical approach to the removal of an interstitial ectopic molar pregnancy. This alternative approach can decrease the intraoperative morbidity while also improving long term obstetrical outcomes as compared to wedge resection.

Open Communications 22: Reproductive Medicine
(4:00 PM — 5:00 PM)

4:18 PM

Doctor, I Have Niche - What Does It Mean?

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Study Objective: The relationship between various niche features and symptoms has not fully been elucidated. The aim of this study is to evaluate the association between the presence of niche to the presence of symptoms.


Setting: Single tertiary medical center.

Patients or Participants: Women that underwent cesarean delivery during January 2011 to December 2018.

Interventions: All women were requested to arrive at the gynecological clinics. During their visit they completed questionnaire regarding symptoms related to the presence of niche (menorrhagia, spotting, pelvic pain and infertility) . A trans-vaginal 2-D ultrasound examination targeted to assess the uterine niche evaluated by length, depth, residual myomtrial thickness (RMT) and the proportion between residual to adjacent myometrial thickness (RMT/AMT). Data are presented as median and Interquartile range.

Measurements and Main Results: Two hundred twenty-five women were included in the study. 128 (56.88%) and 97 (43.11%) were symptomatic and asymptomatic, respectively. Median time from delivery to follow-up was 16 months for both of the groups. RMT was the only measurement associated with symptoms. RMT < 2.5mm was more prevalent in women reporting new onset infertility (14.8% vs. 2.1%; p=0.001). This finding was consistent in logistic regression analysis that revealed infertility as the only parameter associated with RMT [B= (-0.48), p=0.03]. Niche length [7.6(5.5-9.8) vs. 7.6(5.6-9.3) mm; p=0.87], depth [4.95(3.4-6.57) vs. 4.4 (3.3-6.42)mm; p=0.44], residual myometrial thickness [5.293.3-7.00] vs. 5.1 (3.5-7.3)mm; p=0.67] and RMT/AMT [0.43(0.29-0.61) vs. 0.47(0.29-0.57); p=0.58] were all comparable between the symptomatic and asymptomatic groups.

Conclusion: Residual myometrial thickness was found associated with infertility. All other niche measurements were comparable between symptomatic and asymptomatic women. Further investigation is required to strengthen this finding.

Open Communications 22: Reproductive Medicine
(4:00 PM — 5:00 PM)

4:24 PM

Laparoscopic Management of a Late-Presenting, Unruptured Interstitial Ectopic Pregnancy

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Study Objective: Interstitial pregnancies are located outside the uterine cavity in the muscular layer of the uterus and account for up to 4% of ectopic pregnancies. Mortality rate from this form of ectopic pregnancy is as high as 2.5% due to the risk of uterine rupture and hemorrhage. Late-presenting interstitial pregnancies are particularly worrisome. The objective of this video is to demonstrate the stepwise resection of a late-presenting, unruptured interstitial ectopic pregnancy by laparoscopic approach.


Setting: Tertiary care academic medical center.

Patients or Participants: A 34-year-old G4P3003 presented to the emergency department with nausea and vomiting. Initial ultrasound in the emergency department showed a pregnancy at 12 weeks 2 days by last menstrual period consistent with ultrasound. It was initially misdiagnosed as an intrauterine pregnancy. Formal ultrasound in our Maternal-Fetal Medicine division showed a crown-rump length of 5.1 cm, and the gestational sac was surrounded by abnormal, cystic-appearing placenta. MRI confirmed an interstitial location and showed a gestational sac measuring 7.9 × 7.7 × 6.9 cm with a crown-rump length of 6.1 cm.

Interventions: Laparoscopic resection of an unruptured ectopic pregnancy involving the uterine cornua and fallopian tube.

Measurements and Main Results: The patient did well and was discharged on postoperative day 1. Quantitative beta-hCG was trended to zero in the outpatient setting.

Conclusion: This case illustrates that interstitial ectopic pregnancy can be safely managed laparoscopically even into the late first trimester and provides an alternative to both laparotomy as a surgical approach and hysterec- tomy as management, especially when future fertility is desired. This case is unique in that prior reports have demonstrated a fertility-sparing approach being feasible at a much earlier gestational age.

Open Communications 22: Reproductive Medicine
(4:00 PM — 5:00 PM)

4:30 PM
Laparoscopic Management of a Second Trimester Tubal Ectopic Pregnancy
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Study Objective: To demonstrate the safe laparoscopic management of a tubal ectopic pregnancy presenting at an advanced gestational age.

Design: Narrated video tutorial for safe laparoscopic management of this rare presentation.

Setting: Ectopic pregnancy most often occurs within the fallopian tube commonly presenting as vaginal bleeding and abdominal or pelvic pain during the first trimester. Second-trimester tubal ectopic pregnancies are extremely rare and carry a significantly higher level of maternal morbidity and mortality compared to first-trimester presentation. Second-trimester tubal ectopic pregnancies are challenging to diagnose by ultrasound alone and may appear as peritoneal or ovarian ectopics. A high degree of suspicion must be maintained to ensure the best maternal outcomes.

Patients or Participants: We present a case of a bleeding tubal ectopic pregnancy diagnosed at 13 weeks and 4 days at an academic tertiary care hospital.

Interventions: A laparoscopic approach to manage a tubal ectopic pregnancy at 13 weeks and 4 days gestational age.

Measurements and Main Results: Laparoscopic approach was utilized with several key steps:
1. Confirmation of the tubal location of the ectopic pregnancy
2. Sequential cuts through the mesosalpinx minimizing injury to the adjacent ovary while limiting intraoperative blood loss
3. Specimen containment and umbilical extraction

Conclusion: Advanced gestational age tubal ectopic pregnancy represents an extremely rare clinical situation that requires the surgeons appreciation for the potential for massive maternal bleeding. Ultrasound diagnosis alone can be very challenging and thus high clinical suspicion should be maintained and appropriate preoperative planning is crucial.

Open Communications 23: Basic Science/Research/Surgical Education
(4:00 PM — 5:00 PM)

4:00 PM
Laparoscopic Ovarian Cystectomy for a 32 Cm Simple Cyst
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Study Objective: To demonstrate a successful example of performing a laparoscopic ovarian cystectomy of a large 32 cm benign pelvic cyst to avoid increased morbidity involved with typical exploratory laparotomy approach for this size mass. This video highlights minimally invasive techniques including how to enter laparoscopically with primary trocar placement directed into the cyst, demonstrates safe retroperitoneal dissection to perform cystectomy, and reviews tissue extraction for a large pelvic cyst.

Design: A 6-minute video reviewing step-by-step demonstration of a laparoscopic ovarian cystectomy of a large, simple, 32 cm pelvic cyst.

Setting: Surgery was performed in an outpatient surgical operating room with the patient under general anesthesia, positioned in low lithotomy with both arms tucked along her sides.

Patients or Participants: 31-year-old nulligravid female with no significant past medical or surgical history presented with a large 32 cm simple ovarian cyst with no concerning signs or objective data consistent with malignancy.

Interventions: Successful resection and removal of a 32 cm simple ovarian cyst via laparoscopy

Measurements and Main Results: N/A

Conclusion: Laparoscopic ovarian cystectomy can be considered as a feasible approach for young females with a large simple adnexal cyst and no concerning signs or objective data consistent with malignancy. With adequate training and appropriate patient selection, a minimally invasive procedure would typically result in faster recovery time and less morbidity for a patient compared to the standard exploratory laparotomy approach.

Open Communications 23: Basic Science/Research/Surgical Education
(4:00 PM — 5:00 PM)

4:06 PM
Laparoscopic Hysterectomy for Placenta Accreta in the Second Trimester
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Study Objective: Placenta accreta is a known, life-threatening obstetric complication. In this video, we present key steps to performing a laparoscopic hysterectomy for management of placenta accreta in the second trimester.

Design: This video details specific surgical techniques that may aid in reducing complications when performing a hysterectomy on a gravid uterus.

Setting: The operative room at a major academic center.

Patients or Participants: Two female patients were identified to have placenta accreta in the second trimester. Both were extensively counseled regarding their risks and their options. Both opted for termination of pregnancy with a total laparoscopic hysterectomy.

Interventions: Two hysterectomies were performed in the operating suite through laparoscopic techniques only. The surgeries were performed with three-5mm laparoscopic trocars and a 5-mm endoscope. Specimens were removed from the vagina.

Measurements and Main Results: No complications were encountered during both hysterectomies. Both patients had same-day discharge, and pathology confirmed the presence of placenta accreta.

Conclusion: This video highlights a surgical option for the management of placenta accreta diagnosed in the second trimester. Patients can be offered a minimally invasive approach to an otherwise life-threatening condition.

Open Communications 23: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:12 PM

Laparoscopy in the Pregnant Patient
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Study Objective: The purpose of this educational video is to provide an overview of the guidelines and indications for laparoscopy in pregnancy. We will review preoperative, intraoperative and postoperative considerations for laparoscopy in this patient population.

Design: N/A

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: Although historically contraindicated in pregnancy, laparoscopy is now the preferred treatment approach to surgical conditions in pregnancy and is considered safe in all trimesters. In this video, we review topics such as patient positioning, recommendations for venous thromboembolism prophylaxis and appropriate monitoring for preterm labor. We also review and demonstrate options for safe laparoscopic port entry and surgical techniques to aid with visualization. We aim to provide a thorough approach to laparoscopy in this unique patient population.

Conclusion: In summary, one in 500 women require surgery in pregnancy. Laparoscopy has become the preferred treatment for many surgical diseases in the gravid patient and is safe during all trimesters of pregnancy. We recommend using a multidisciplinary approach and taking appropriate precautions as outlined in this video.

Open Communications 23: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:18 PM

Laparoendoscopic Single-Site Surgical Techniques for Management of Adnexal Masses in Pregnancy
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Study Objective: To demonstrate key techniques that can be utilized in laparoendoscopic single-site surgery (LESS) for removal of an adnexal mass in pregnancy.

Design: This video demonstrates skills for removal of an adnexal mass in pregnant patients using LESS. If able to be contacted, patients were followed until delivery.

Setting: All surgeries were performed at an academic hospital.

Patients or Participants: Three pregnant women who each required removal of an adnexal mass underwent LESS. First, a 30-year-old G1P0 presented with a persistent 7.1 cm simple ovarian cyst concerning for torsion. Second, a 21-year-old G2P010 had a 17.4 cm benign ovarian mucinous cystadenoma. Third, a 32-year-old G3P2002 presented with a 10.5 cm complex adnexal mass.

Interventions: LESS was performed in three pregnant women. An adnexal mass can be removed through the single-site umbilical incision with several key techniques that can be applied to enhance and simplify LESS in pregnancy: (1) gauze placement under a simple ovarian cyst to absorb spillage and to isolate the cyst in order to prevent inadvertent injury; (2) use of V-Loc suture to reapproximate the ovarian parenchyma to preserve ovarian function and avoid difficult knot-tying; (3) extracorporeal surgical approach after drainage of cystic contents and delivery of the collapsed ovarian cyst through the incision; and (4) in-bag tissue extraction of concerning ovarian pathology at the incision.

Measurements and Main Results: Two simple cystectomies were uncomplicated. The third patient had an uncomplicated oophorectomy after intraoperative pathology revealed a stage IIIA germ cell tumor. The first and third patient had full-term uncomplicated vaginal deliveries, and the second was lost to follow-up at 35 weeks.

Conclusion: LESS in a gravid uterus is technically challenging due to loss of triangulation of instrumentation. Application of the techniques demonstrated in this video can simplify LESS for removal of an adnexal mass in pregnant women with preservation of pregnancy and resolution of symptoms.

Open Communications 23: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:24 PM

Vaginal Cuff Closure Simulation: An Innovative Approach Using the FLS Lap Trainer
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Study Objective: Our objective was to describe a low-cost, easy-to-construct simulation model of laparoscopic vaginal cuff closure.

Design: Resident education simulation concept.

Setting: Simulation center.

Patients or Participants: OBGYN Residents.

Interventions: Modification of the FLS laparoscopic box trainer for simulation of vaginal cuff closure with two low-cost cuff models.

Measurements and Main Results: With the incorporation of the FLS assessment into the American Board of Obstetrics and Gynecology requirements, OBGYN residents have access to the standardized FLS laparoscopic box trainers. Our video demonstrated easy-to-construct modifications to the trainer box to optimize the simulation of proper port placement and provider positioning during a laparoscopic vaginal cuff closure. Rather than the traditional box trainers with the camera between the two ports, our modification used two ports placed lateral to the camera. We discuss two low-cost, reusable models – the Koozie and 3-Dmed Wet Vaginal Cuff. Both models replicate the inner vaginal mucosal layer and can be attached using the FLS box clip. We illustrated the steps of the vaginal cuff closure, highlighting key components and helpful tips on both of the simulation models. Demonstration of these models was depicted alongside intra-operative surgical footage. Residents can practice these skills on the two models in the modified FLS box trainer.

Conclusion: Residents can practice their surgical skills using the laparoscopic vaginal cuff closure simulation model and a modified FLS box trainer.

Open Communications 23: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

4:30 PM

Laparoscopic Management of Cesarean Scar Ectopic Pregnancy after Failed Medical Management

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Study Objective: We describe a step-by-step approach of laparoscopic resection of cesarean scar ectopic pregnancy.

Design: A case report video.

Setting: Teaching hospital.

Patients or Participants: A 29-year-old gravida 4 para 1 woman who underwent a cesarean section two years back. She was diagnosed with cesarean scar ectopic pregnancy by transvaginal ultrasound scan with a 6-week live pregnancy. The patient received 2 doses of intramuscular injections of methotrexate. But on monitoring, the size of the ectopic sac remained the same with decline in the beta hCG. Suction evacuation was planned and post suction evacuation, patient started bleeding through os profusely for which uterine tamponade was done. After keeping patient in observation for 24 hours, the bleeding had not stopped. Thus, patient was considered for life saving laparoscopic excision of cesarean scar ectopic pregnancy.

Interventions: Laparoscopic management of cesarean scar ectopic pregnancy.

Measurements and Main Results: The diagnosis of cesarean scar ectopic pregnancy was confirmed laparoscopically. The lower uterine segment was extremely thinned out. The uteroesophageal fold of peritoneum was dissected and bladder was pushed caudally. Adhesiolyisis was done between the previous cesarean scar and the bladder. The ectopic gestational sac was identified, and incision was given at the most prominent site of the cesarean scar. The products of conception were evacuated in an EndoBag and extracted through the infra-umbilical port. The specimen was sent for histopathological examination. The margins of the previous scar were excised, and the uterine defect was repaired in two layers. Hemostasis was achieved. Intraoperative blood loss was minimal. Patient tolerated the procedure well and was discharged on POD3.

Conclusion: Laparoscopy is a safe and effective procedure of managing cesarean scar ectopic pregnancy after failed medical management. This gives an advantage of minimal blood loss, decrease post-operative pain and better cosmetic results.

Open Communications 23: Basic Science/Research/Surgical Education (4:00 PM — 5:00 PM)

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Content Assessment of Online Surgical Education

Videos for Total Laparoscopic Hysterectomy (TLH)

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Study Objective: This study aims to assess the content of online videos as an educational supplement for gynecology trainees for Total Laparoscopic Hysterectomy (TLH).

Design: We performed a cross-sectional analysis of relevant YouTube videos. The keywords “laparoscopic total hysterectomy surgical training” and “laparoscopic total hysterectomy surgical education” were used to retrieve the top 60 videos per search query. Videos without live surgical footage, audio narration, or with commercial intent were excluded. Two independent reviewers evaluated the videos using the “Objective Scale Specific for the Assessment of Technical skills for Laparoscopic Hysterectomy” (H-OSATS) to assess the inclusion of necessary steps, the “Modified Objective Structured Assessment of Technical Skills” (M-OSATS) for laparoscopy to assess surgical technique and a 3-point Likert scale to assess surgical difficulty.

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: A total of 12 videos were analyzed: 11/12 (91.6%) videos were created by physicians without academic affiliations, and 1 was from an academic center. The mean H-OSATS and M-OSATS scores were 21.73/53 (41%) and 16.5/20 (82.5%) respectively. Inter-rater agreement was rated at 95.3% with a Cohen’s kappa of 0.90. All videos included instruction on the division of uterine and utero-ovarian pedicles (100%). However, the majority of videos did not provide instruction on patient positioning (83%), abdominal entry (77%), trocar insertion (67%), division of the cervical attachments of the cardinal ligaments (62%), port removal (100%), and skin closure (100%). The mean surgical difficulty was rated as 1.6/3.

Conclusion: Online surgical videos likely demonstrate adequate surgical skill and technique, but do not provide comprehensive instruction on the essential steps of conducting a TLH. There is a need for the production of open-access high quality comprehensive videos for TLH instruction.
Open Communications 23: Basic Science/Research/Surgical Education
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4:42 PM

Retrospective Implementation of Algorithm for Route of Hysterectomy in Resident Clinic May Increase Rates of Vaginal Hysterectomy
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Study Objective: A resident-driven quality improvement project designed to evaluate whether retrospective application of a decision-making algorithm to guide selection of route for benign hysterectomy may have resulted in increased rates of total vaginal hysterectomy (TVH) in resident gynecology clinic.

Design: Retrospective chart review of all hysterectomies booked through resident pre-operative gynecology clinic over a five-year period.

Setting: Resident-run gynecology clinic in a large, urban academic medical center.

Patients or Participants: 162 patients underwent hysterectomy for benign indications in the five-year period under review (1/2015-12/2019).

Interventions: We created an algorithm to guide selection of route of hysterectomy for benign disease based on existing guidelines and review of literature. Electronic medical records (EMR) were reviewed for preoperative documentation of benign disease, uterine size and presence of adequate cervix, need for adnexal assessment (i.e. concern for large ovarian mass, endometriosis), concern for pelvic adhesions based on exam, or other rationale for route selection. The algorithm was retrospectively applied to identify which cases may have been preoperative candidates for TVH.

Measurements and Main Results: Retrospective application of our algorithm indicated that 61 of the 162 cases may have been candidates for TVH, and an additional 57 may have been candidates for an exam under anesthesia/diagnostic laparoscopy followed by possible TVH. Only 25 cases were booked as TVH; 5 were booked as EAU or diagnostic laparoscopy before TVH. Identified areas of improvement include assessment for adequate pelvis and proper counseling, particularly in “intermediate category” candidates.

Conclusion: By retrospectively implementing an algorithm to identify candidates for TVH, based on available documentation, it appears that a large percentage of cases booked from resident clinic could have been attempted vaginally. This shows opportunity for prospective implementation of the algorithm to increase rates of vaginal hysterectomy from the current rate of 15% to as high as 38%.

Open Communications 24: Laparoscopy
(4:00 PM — 5:00 PM)

4:06 PM

Potential Effect of Celecoxib on Pain Reduction and Gene Expression Related with Prostaglandins after Single Port Laparoscopic Surgery
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Study Objective: To evaluate the potential effect of celecoxib on pain reduction and identify change of expression of relevant genes after laparoscopic surgery for benign gynecologic diseases.

Design: A randomized, double-blind, placebo-controlled pilot trial

Setting: Under general anesthesia single port laparoscopic surgery was done in lithotomy position.

Patients or Participants: Patients who received single port laparoscopic surgery for benign gynecologic disease from October 2017 to April 2018.

Interventions: All patients were randomly assigned according to preoperative medication as follows: celecoxib 400 mg; placebo 400 mg. Two peritoneal tissues were obtained before and after capnoperitoneum, and all patients received patient-controlled analgesia (PCA) after surgery. Thereafter, we evaluated numeric rating scale (NRS), and the numbers of intravenous ketorolac used as a rescue drug. Moreover, we compared expression of genes which activate PG such as PG E2 synthase (PTGES), PG E synthase (PTGES), PTGES3, and genes which inactivate PG including 15-hydroxyprostaglandin dehydrogenase (HDPG) and aldo-keto reductase family 1 member C3 (AKR1C3) in the two peritoneal tissues between the two groups by reverse transcription polymerase chain reaction.

Measurements and Main Results: A total of 62 patients received celecoxib (n=30) and placebo (n=32), and there were no differences in characteristics between the two groups. Pain reduction by celecoxib was observed in only patients whose capnoperitoneum maintained 60 min or more, and the effect was more definite in those under PCA. When we...
compared the five genes between the two groups, an increase of HDPG expression was also identified in only those whose capnoperitoneum main-
tained 60 min or more.

Conclusion: The potential effect of celecoxib may be related with an increase of HDPG expression in patients whose capnoperitoneum main-
tained 60 min or more (No. of trial; NCT03391570).

Open Communications 24: Laparoscopy
(4:00 PM — 5:00 PM)

Do Gynecologic Surgeons Overprescribe Opioid Pain Medications after Minimally Invasive Surgery?
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Study Objective: This study investigates patients undergoing minimally invasive gynecologic surgery to determine if patients are overprescribed opioid pain medications post-operatively.

Design: Patients from one community teaching hospital affiliated physician group practice undergoing minimally invasive gynecologic procedures scored their pain using a Visual Analog Scale immediately before surgery and at their 2-week post-operative visit. During this time, patients also indicated the number of narcotic pills consumed.

Setting: N/A

Patients or Participants: 116 patients were enrolled.

Interventions: N/A

Measurements and Main Results: A total of 116 patients were enrolled. Patients consumed an average of 5.7 pills with a mean of 22.6 pills prescribed per patient. Using multivariate analysis, variables included were BMI, anesthesia, and difference in pain. Narcotic pill consumption significantly increased as difference in pain score (p=0.01) and BMI (p=0.04) increased. Patients under general anesthesia who received transverse abdominis plane (TAP) block and/or local anesthesia prior to incision used the least number of narcotic pills (2.5) compared to local injected at closing/no anesthetic (p=0.07). Type of surgery (laparoscopic/robotic), port size, and number of ports were statistically insignificant relative to narcotics consumed.

Conclusion: Overall, patients of one surgical practice undergoing minimally invasive gynecologic procedures use approximately one-fourth of opioids prescribed; supporting the theory that physicians overprescribe narcotics. Although not statistically significant, our study demonstrated reduced narcotic consumption post operatively in patients who had received a TAP block and/or local anesthesia prior to incision, after accounting for other potential factors: BMI, pain scores and timing of local/regional anesthesia placement. This research suggests that surgeons should follow-up with patients in their practices to determine if the average patient requires fewer narcotics prescribed.

Open Communications 24: Laparoscopy
(4:00 PM — 5:00 PM)

Adnexal Torsion Recurrence - Is the Degree of Adnexal Twist a Risk Factor?
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Study Objective: To determine whether the adnexal twist degree is related to torsion recurrence and whether there is a dose-dependent relationship.

Design: Cases of first ovarian torsion that were diagnosed operatively in non-pregnant women between 2011-8-2018 were collected retrospectively. The study was performed in a single tertiary care center. Information regarding recurrence was gathered using computerized database. Patients with missing data were approached via phone (response rate of 87.2%).

Setting: N/A

Patients or Participants: 336 cases were found, of them 195 met inclusion criteria.

Interventions: N/A

Measurements and Main Results: Twenty-two women had torsion recurrence (11.3%). In a univariate analysis, adnexal twist degree in the primary event was associated with a higher risk for recurrence: 4.3% of women with twist degree ≤360 (N=3/70), 14.5% of women with twist degree of 361-720 (N=9/62) and 19.6% of women with twist degree >720 (N=10/51) (P value=0.029). That association was observed in a Mann-Whitney analysis as well, as median twist degree among women without torsion recurrence was 540 (N=173, IQR 360-900) versus 720 among women with recurrence (N=22, IQR 675-1080) (P value=0.005).

Other possible influencing factors for recurrence were evaluated, such as adnexal size, presence of a cyst, polycystic ovaries, adnexal color, presence of adhesions and contraceptives use, none were found significant.

Logistic regression analysis after adjustment for confounding factors revealed that adnexal twist degree remained significantly associated with higher rates of torsion recurrence (OR 2.06, 95% CI 1.11-3.84, P value=0.022).

Conclusion: Adnexal twist degree in ovarian torsion might be correlated to risk of ovarian torsion. Further studies with bigger cohorts are needed.

Open Communications 24: Laparoscopy
(4:00 PM — 5:00 PM)

4:24 PM

Robot-Assisted Laparoscopic Management of Vascular Entrapment of the Sacral Nerve Roots Causing Motor Deficit
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Study Objective: To demonstrate the robot-assisted laparoscopic decompression approach to treat aberrant vessels entrapping the sacral nerves causing motor deficit.

Design: Video presentation of two cases.

Setting: Tertiary unit specializing in advanced gynecologic surgery and neuropelvology.

Patients or Participants: Case 1: A 23-year-old virgin female patient presented with right lower extremity weakness, which had progressed into a limp over the past year and dysmenorrhea with a VAS (visual analog scale) score of 10. Gynecological examination revealed
a 2 cm endometrioma on the right ovary. Under neurological examination, a hypothesia on right peroneal and right tibial nerve-dermatomes and chronic denervation of the muscles innervated by L5-S1 were observed.

**Case 2:** A 46-year-old gravideity 3 parity 3 female patient presented with non-menstrual left sciatic pain, which caused difficulties while wearing socks and high heels and climbing up stairs. Magnetic resonance imaging (MRI) revealed dilated vessels on the left sacral nerve roots.

**Interventions:** Robot-assisted laparoscopic sacral nerve decompression

**Measurements and Main Results:** Patients were evaluated at 3rd and 6th month postoperatively. First patient’s electromyography (EMG) result was normal at the 3rd month control. Motor deficit of both patients were eliminated and they both recovered fully.

**Conclusion:** Motor deficit or pain radiating (i.e. sciatica) to lower extremities are usually caused by spinal cord problems. However, these symptoms could arise by anatomic structures obstructing the nerves travelling to target organs or by nerve injuries. Since lumbosacral plexus is located over the sacral bone, it can be compressed easily by abnormal vessels crossing over the plexus. Accessing to the sacral plexus between lateral iliac vessels and ilioptas muscle is crucial and stable instruments are crucial during surgery. Robotic-assisted laparoscopy allows this stability and decrease the possibility of complications. The robotic technique offers, three-dimensional vision, improved maneuverability and enhanced ergonomics in the deepest parts of the pelvis.

**Open Communications 24: Laparoscopy**

**4:00 PM — 5:00 PM**

**4:30 PM**

**Perioperative Complications of Laparoscopic Versus Open Surgery for Pelvic Inflammatory Disease**

Carlson S., 1 Billow M., 1 El-Nashar S., 1 Chapman G., 1, 3

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**Study Objective:** To compare complications in patients undergoing laparoscopic versus open surgery for acute pelvic inflammatory disease (PID).

**Design:** We performed a retrospective cohort study of patients who underwent surgery for PID using the National Surgical Quality Improvement Program database from 2010-2015. Propensity-score matching was used to balance baseline characteristics and compare complications in patients who underwent laparoscopic versus open surgery.

**Setting:** Surgical management of acute PID.

**Patients or Participants:** Patients with preoperative diagnosis of PID were identified using ICD-9 codes. We excluded patients with a diagnosis of chronic PID, with gynecologic malignancy, and those whom the surgical route was unknown.

**Interventions:** Surgery for acute PID.

**Measurements and Main Results:** The study population was comprised of 367 patients. The mean age was 43.0±11.1 years, BMI was 29.4 (IQR 24.3-36.7), and ASA class was 2 (IQR 2-3). Preoperative sepsis was noted in 32.4%, and septic shock was present in 1.4%. Hysterectomy was performed in 67.6%, oophorectomy in 12.0%, and salpingectomy in 4.6%. Complications were experienced by 115 patients (31.3%), 14 (3.8%) of which were potentially life-threatening. Multivariate logistic regression identified the following to be independently associated with complications: laparoscopy (aOR 0.55, p=0.04), hysterectomy (aOR 1.87, p=0.05), appendectomy (aOR 2.6, p=0.03), preoperative hematocrit < 30g/dl (aOR 2.68, p<0.01), preoperative INR > 1.2 (aOR 2.44, p<0.01), and operative time (aOR 1.004, p=0.02). Propensity-scores were calculated and utilized to generate a matched cohort of laparoscopic versus open surgery; groups were similar with p<0.05 for all covariates. After balancing potentially confounding variables, the composite complication rate remained lower in patients who underwent laparoscopy (20.5%) versus open surgery (35.2%), p=0.04.

**Conclusion:** Laparoscopy was associated with lower complication rates than open surgery in this well-matched cohort of patients who underwent surgery for acute PID.

**Open Communications 24: Laparoscopy**

**4:00 PM — 5:00 PM**

**4:36 PM**

**A Stepwise Strategy to Minimally Invasive Salpingo-Oophorectomy in the Post-Hysterectomy Patient**

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**Study Objective:** Demonstrate a five-step strategy for effective, safe completion of a minimally invasive salpingo-oophorectomy in patients with prior hysterectomy.

**Design:** Step-by-step demonstration and explanation of technique using a surgical video

**Setting:** Tertiary-care operating room using standard equipment for laparoscopic surgery and three 5 mm trocars, a 30 degree laparoscope, and bipolar sealing device.

**Patients or Participants:** A 56 year-old female patient presents with pelvic pain and persistent adnexal mass and requesting definitive surgical management.

**Interventions:** Five steps were utilized to perform a laparoscopic bilateral salpingo-oophorectomy in a patient with prior open total abdominal hysterectomy. The stepwise procedure was highlighted on one side without significant adhesions and then repeated on the opposite side with a more challenging adnexal mass

**Measurements and Main Results:** Post-hysterectomy salpingo-oophorectomy can pose significant surgical complexity. With increasing data on the benefits of ovarian conservation during hysterectomy especially in pre-menopausal women such as cardiovascular health, bone and sexual health, more patients elect to preserve their ovaries. Up to 9% of these women who preserved their ovaries at the time of hysterectomy require future adnexal surgery. Some of the common indications for post hysterectomy salping-oophorectomy are persistent adnexal masses, chronic pelvic pain, suspicious adnexal masses concerning for malignancy, and risk-reducing surgery. This video presents a five step strategy to facilitate this procedure to include pelvic and abdominal exploration, restoring normal anatomy, identification of the ureter, isolation, coagulation, and transection of the infundibulopelvic ligament and hemostasis and re-evaluation of ureter.

**Conclusion:** In this video we described a five step strategy to ensure safe, efficient and reproducible salpingo-oophorectomy in the post hysterectomy patient using a minimally invasive approach. Although this surgery can be challenging to perform in post hysterectomy given anatomical variance and adhesive disease, by following these five simple principles we aim to simplify this potentially difficult procedure.
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Barriers to Referral to Minimally Invasive Gynecology Surgical Subspecialists
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Study Objective: To determine patterns and barriers for referral to minimally invasive gynecologic surgery (MIGS) fellowship-trained subspecialists.

Design: Questionnaire.

Setting: United States and its territories and Canada.

Patients or Participants: Actively practicing general obstetrician/gynecologists (OB/GYNs).

Interventions: N/A

Measurements and Main Results: There were 155 respondents. Of the respondents, 142 (91.6%) general OB/GYNs were included. Subspecialty fellowship training resulted in exclusion of 13 (8.4%) respondents. Eight-five respondents (59.9%) considered referral to MIGS fellowship-trained subspecialists. Factors that were not associated with decision to refer to MIGS subspecialists included years in practice (p=0.16), additional training experiences beyond residency (p=0.10), and number of hysterectomies performed via laparotomy (p=0.34). Self-reported high volume surgeons (p<0.01) were more likely to not refer. In contrast, providers who self-reported as low volume surgeons (p=0.02) and who were aware of MIGS subspecialists in the community (p<0.01) were more likely to consider referral. The top 3 cited reasons for non-referral were adequate residency training (n=83, 58.5%), preference for continuity of care (n=48, 33.8%), and preference for referral to other providers (n=45, 31.7%). The top 3 cited reasons for referral to MIGS subspecialists were complex pathology (n=90, 63.4%), complex medical and/or surgical history (n=74, 52.1%), and out of scope of practice (n=52, 36.6%). Most respondents reported using a laparoscopic approach to hysterec-tomy most frequently (55%). In contrast, 37% preferred the laparoscopic route for themselves or their partner while 48% preferred the vaginal approach. If providers required intraoperative assistance, respondents consulted an OB/GYN colleague with comparable training (n=49, 34.5%), gynecologic oncologist (n=47, 33.1%), or non-OB/GYN surgical subspecialist (n=33, 23.2%).

Conclusion: The majority of general OB/GYNs would consider referral to MIGS fellowship-trained subspecialists. Providers who reported adequate residency training, and those who preferred continuity of care or referral to other surgical subspecialists were less likely to refer to MIGS subspecialists.

Practical Tips for Needle Introduction in Laparoscopy
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Study Objective: The objectives for this video are 1) to provide an overview of common suture and needle types that are used in gynecologic laparoscopy and 2) to present various strategies to introduce different needles into the abdomen.

Design: In this video, we discuss approaches to introducing the needle into the abdomen during laparoscopy. The needle can generally be introduced either vaginally or abdominally.

Setting: During laparoscopy, all patients were positioned in dorsal lithotomy and in Trendelenburg position for the needle introduction process.

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: In order to maintain small incisions while introducing a needle for suturing, one must have an understanding of the various needles, trocars, and techniques that can be used to introduce them. Abdominal introduction can further be subdivided into direct trocar entry, backloading the needle, and skiing the needle techniques. Direct trocar entry is dependent on the size of the needle and the diameter of the trocar. Backloading and skiing the needle are techniques that can be used when there is a need to pass a needle through a smaller trocar, for example when using 5 millimeter trocars. Generally, the 5 millimeter trocar will only be able to directly accommodate a Keith needle.

Conclusion: For laparoscopic procedures such as hysterectomy, needle introduction is the first step in the suturing process and familiarly with needle types, trocar size, and introduction techniques can assist with surgical efficiency.

Association between Laparoscopic Appearance of Superficial Endometriosis and Positive Histology
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Study Objective: To assess the association between laparoscopic appearance of possible superficial endometriosis and odds of positive histology.

Design: Retrospective cohort study

Setting: Tertiary, academic medical center

Patients or Participants: Between 09/2015 and 11/2018, 194 women underwent laparoscopy at an endometriosis center with excision of lesions consistent with possible superficial endometriosis.

Interventions: Appearance of peritoneal lesions was confirmed with review of surgical videos and correlated with each specimen. Lesions were analyzed by pathology status.

Measurements and Main Results: A total of 841 lesions were biopsied from included subjects during the study period. Of those, 251 biopsies were negative and 590 were positive. Lesions had significantly higher odds of positive histology when they were red (OR 1.70, 95%CI 1.17-2.48), white (OR 1.99, 95%CI 1.47-2.70), blue/black (OR 2.98, 95%CI 2.00-4.44), or puckering (OR 9.78, 95%CI 2.46-38.91) in appearance. Lesions that were vascular, clear, yellow, or brown did not have a significant association with pathology results, however, of the 188 lesions with these characteristics, 135 were positive (73.8%). When assessing combinations of lesion characteristics within the same region of a given patient, the following had significantly higher odds of positive histology: white and blue (OR 5.98, 95%CI 2.97-12.02), red and white (OR 2.22, 95%CI 1.38-3.56), and red and blue (OR 4.11, 95%CI 1.83-9.24), clear and white (OR 8.77, 95%CI 1.17-66.02), and white and puckering (OR 8.85, 95%CI 2.00-30.87).
Conclusion: Lesions have higher odds of positive histology with red, white, blue/black, or puckering appearance or with a combination of white and blue, red and white, red and blue, clear and white, or white and puckering appearance. Vascular, clear, yellow, or brown lesions did not have an association with pathology results, however a high proportion of these lesions had positive pathology. These data have implications for appropriate identification of endometriosis and emphasize the importance of excision of all lesion types to ensure complete resection and accurate diagnosis of disease.

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Study Objective: To evaluate the feasibility of sentinel lymph node (SLN) mapping in obese endometrial cancer patients.

Design: A retrospective study of obese patients (BMI ≥35 kg/m²), diagnosed with endometrial carcinoma between 2007 and 2017, comparing surgical and oncological outcomes of two patient’s cohorts.

Setting: Tertiary gynecology oncology center.

Patients or Participants: 223 patients with median BMI of 40.6 kg/m² including: 140 patients that underwent LND (with or without SLN) and 83 patients that underwent SLN.

Interventions: Lymph node dissection (LND) with or without SLN versus only SLN for endometrial cancer staging.

Measurements and Main Results: Patients that had only SLN seemed to have more metastatic pelvic nodal disease (13.3% vs. 7.1%), though this difference did not reach statistical significance (p=0.2). Patients from the SLN only group had significantly higher rate of successful mapping (92.8% vs. 78.4%, p<0.009), bilaterally detected SLN (80.7% vs. 54.5%, p<0.001) and Indocyanine green (ICG) usage (95.2% vs. 36.4%, p<0.001). The median operative time for surgical staging in SLN only group was shorter in 47.5 minutes than for patients in the LND+/-SLN group (190.5 minutes (108-393) vs. 238 minutes (131-440), respectively, (p < 0.001)), and they had reduced estimated blood loss compared to the LND+/-SLN group (30 ml (0-300) vs. 40 ml (0-800ml), p=0.03). At a 24 months follow-up cut-off, 98% of the patients were alive, without significant differences in OS, DSS and PFS between the two groups. Obese patients that were injected with ICG for the SLN procedure had higher successful mapping and bilateral detection rates compared to blue dye (92.8% vs 71.7%, p<0.001 and 80.2% vs 43.3%, p<0.001, respectively).

Conclusion: Omitting LND from surgical staging where SLN is performed was associated with shorter operative time and minimal bleeding without affecting survival. ICG should be the dye of choice in obese endometrial cancer patients.

Are There Differences in Surgical Outcomes Among Patients Operated on By Female Versus Male Surgeons in North America? (A Systematic Review)
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*Corresponding author.

Study Objective: To demonstrate a minimally invasive myoma tissue extraction technique following laparoscopic myomectomy in a patient with a dilated cervix.

Design: Surgical video.

Setting: Surgery occurred in an academic medical center. The patient was placed in dorsal lithotomy position. A uterine manipulator was used.

Patients or Participants: A 33-year-old nulligravida presented to the office with a 9-month history of abnormal uterine bleeding and pelvic pain, unimproved by medical management and abdominal myomectomony performed 6 months prior. She had required multiple blood transfusions since surgery. She was using enoxaparin due to an active DVT. On examination, her uterus was 19 weeks in size and the cervix was 1.5cm dilated around a 6cm intracervical fibroid. MRI revealed multiple Type 1 and 2 fibroids.

Interventions: On laparoscopy, an incision was made on the uterine fundus and carried down to the endometrium, which was intentionally opened to reveal numerous submucosal fibroids. Working from the fundus to cervix, fibroids were successively enucleated. Eventually, the aborting cervical fibroid was laparoscopically extracted. Several fibroids were then removed via transcervical extraction. A laparoscopic tenaculum was passed through the dilated cervix and into the abdominal cavity through the hysterotomy. Fibroids were sequentially transferred to the transcervical instrument and extracted intact through the cervix. A total of 16 fibroids were removed and the myometrium was closed in 3 layers. A Foley catheter was placed in the endometrial cavity.

Measurements and Main Results: Uterine Foley was removed on POD#7. Two weeks after surgery, the patient reported significant improvement in bleeding and pain. Hemoglobin rose from 8.3 (POD#1) to 9.5.

Conclusion: Laparoscopic myomectomy is an alternative to hysteroscopic myomectomy in cases of numerous or large submucosal leiomyomas. Our transcervical tissue extraction technique saves operative time when both a
dilated cervix from a prolapsing fibroid and extensive submucosal disease are present.

**Does Obesity and Procedure Type Increase the Risk of in-Hospital Mortality in Laparoscopic Hysterectomy?**

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**Study Objective:** To assess the differences in demographics and laparoscopic hysterectomy type by comorbid obesity and to assess the risk of in-hospital mortality due to obesity and other comorbidities.

**Design:** We conducted a cross-sectional data analysis using the healthcare cost and utilization project’s (HCUP) nationwide inpatient sample (NIS) data from 2012 to 2014.

**Setting:** In-patient data using the NIS that provides patient records from about 4,400 non-federal hospitals and covers 45 states in the US.

**Patients or Participants:** We identified 119,890 adult females undergoing laparoscopic hysterectomies based on ICD-9 procedure codes. We identified differences in demographic, comorbidities and procedure types between obesity (N=17,370) and non-obesity (N=102,520) cohorts. Further, we used logistic regression model adjusted for confounders to assess the odds ratio (OR) of obesity on in-hospital mortality.

**Interventions:** Total laparoscopic hysterectomy (TLH), laparoscopic assisted vaginal hysterectomy (LAVH), and laparoscopic supravaginal hysterectomy (LSH).

**Measurements and Main Results:** Majority of the inpatients underwent TLH (51.3%), followed by LAVH (25.8%) and LSH (12.9%). Majority of the inpatients were middle-age adults 36 to 50 years (83.1%) and White (67.7%) with obesity cohort older than non-obesity (51.3y vs. 48.8y, P<0.001). Asian/Pacific islanders and Hispanic were at 6.5 times (95% CI 2.51 − 16.77) and 2.6 times (95% CI 1.29 − 5.21) respectively higher risk for in-hospital mortality compared to White. Comorbidities were seen in higher proportion of obesity cohort with most prevalent being hypertension (53.6%) and diabetes (23.9%), followed by depression and hypothyroidism (15.8% and 15.4%, respectively). Inpatients with comorbid obesity had 4.6 times (95% CI 2.79 − 7.69) higher odds for in-hospital mortality compared to non-obesity cohort. There was statistically no significant association between type of laparoscopic hysterectomy and in-hospital mortality.

**Conclusion:** Analysis of national-level data shows that obese patients have increased perioperative mortality with higher prevalence of co-morbidities. More research studies should focus on improving these outcomes in obese patients.

**Ureteral Neocystotomy with Psoas Hitch**

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**Study Objective:** This video demonstrates the key steps in performing a ureteral reimplantation with psoas hitch.

**Design:** N/A

**Setting:** A single surgical center within a large integrated healthcare system.

**Patients or Participants:** The patient is a 40-year-old G0 woman with stage IV endometriosis who was found to have acute left hydronephrosis secondary to an endometriosis implant compressing the left distal ureter. Her past medical history is otherwise notable for stage IV metastatic breast cancer status post a bilateral mastectomy with no evidence of residual disease for the past 3 years. Her past surgical history is notable for an exploratory laparotomy for a small bowel obstruction due to endometriosis. She opted for surgical management with robot-assisted total laparoscopic hysterectomy, bilateral salpingectomy, unilateral oophorectomy, ureteral resection with ureteral reimplantation and psoas hitch.

**Interventions:** The patient underwent an uncomplicated robot-assisted total laparoscopic hysterectomy, bilateral salpingectomy, unilateral oophorectomy. As expected, narrowing of the left ureter was noted and a planned ureteral resection with ureteral reimplantation and psoas hitch was performed in conjunction with urology.

**Measurements and Main Results:** N/A

**Conclusion:** Ureteral resection and reimplantation can alleviate endometriosis-related urinary tract obstruction.

**Mental Health Diagnoses and Opioid Use Among Women with Chronic Pelvic Pain and Endometriosis**

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**Study Objective:** To examine the differences in mental health diagnoses and opioid use in reproductive-age women with a diagnosis of endometriosis or chronic pelvic pain (CPP) compared to a general gynecology population.

**Design:** Retrospective cohort study of women evaluated in 2016 in a women’s health service line of a large hospital system. One year of previous data and three years of follow up data were analyzed.

**Setting:** Women who presented for care to a women’s health service providers at a large hospital system.

**Patients or Participants:** 247,781 non-pregnant females aged 18-50 with records in the electronic medical system (EMR) in year 2016 were analyzed in this study.

**Interventions:** N/A

**Measurements and Main Results:** Women with a diagnosis of endometriosis (3,883) and CPP (21,619) had significantly increased rates of depression (17.7% and 16.6% respectively), post-traumatic stress disorder (1.2% and 1.1%) and anxiety (25.4% and 21.5%) as compared to the general gynecology population rate of depression (11.1%), PTSD (0.6%), and anxiety (15.5%; all p<0.001). In addition, the use of narcotics was nearly two-fold more than the general population (28.5% of endometriosis patients and 23.5% of chronic pelvic pain versus 15.1% of the general gynecology population; p<0.001). Among those who underwent excision or fulguration of endometriosis post-procedure rate of substance abuse over 3 years was decreased at 10.3% as compared to women who did not undergo these surgical interventions (16.2%; P=0.169).

**Conclusion:** In addition to screening women with CPP and endometriosis for mental health disorders, surgery for excision of endometriosis in women with a diagnosis of endometriosis should be considered as a modality to decrease rates of substance abuse in this population. This data underscores the importance of a multidisciplinary approach to optimize care for these patients.

**Lysis of Anterior Abdominal Wall Adhesions during Pelvic Laparoscopic Surgery: An Ergonomic Seated Approach**

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*Corresponding author.

**Study Objective:** To describe a seated position during laparoscopic adhesiolysis of the anterior abdominal wall in pelvic gynecologic surgery that improves the surgeon’s ergonomic positioning and lessens discomfort.

**Design:** Photos of the surgeon during traditional standing approach and seated approach were taken intraoperatively and posture was compared against standard ergonomic guidelines. Posture was evaluated by measuring angles between anatomic areas such as the angle of flexion at the elbow.
Use of Modified Enhanced Recovery after Surgery Protocol to Improve Pain and Decrease Narcotic Use in Gynecologic Oncology Patients

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Study Objective: We investigate how implementation of multimodal scheduled analgesia affects pain scores and narcotic use.

Design: Retrospective chart review of patients who underwent minimally invasive gynecologic surgery from September 2017 until June 2018.

Setting: Community medical center, patients on gynecologic oncology service.

Patients or Participants: Total of 120 charts initially reviewed. Patients excluded if underwent laparotomy or complete charts unavailable for review. Total of 72 charts reviewed after exclusion.

Interventions: Modified ERAS (enhanced recovery after surgery) protocol was defined as patients who received pre-operative pain medication including acetaminophen and celecoxib, and post-operatively received scheduled acetaminophen and ketorolac and as needed narcotics. 32 patients analyzed in pre-ERAS group and 40 patients analyzed in modified ERAS group.

Measurements and Main Results: For the primary outcome of narcotic use, pre-ERAS patients utilized significantly more narcotics on both post-operative day 0 and 1 (p = 0.003, p = 0.001 respectively using Chi Square analysis). For the secondary outcome of decreased pain, median pain score on post-operative day 0 was not different in pre-ERAS vs. modified ERAS groups with median pain score of 5 (mean 5.8 +/- 2 vs. 5.2 +/- 2.1 using Wilcoxon Rank Sum). Median pain score on post-operative day 1 was decreased in modified ERAS patients, with median pain score of 7 for pre-ERAS patients and 4 for modified ERAS patients (mean 6.5 +/- 1.9 vs. 3.8 +/- 2.4 using Wilcoxon Rank Sum). Total narcotic use was increased for pre-ERAS patients compared to modified ERAS patients, with median number of 2.5 pills for pre-ERAS patients and 0 pills used for modified ERAS (mean 4.8 +/- 5.4 vs. 1.5 +/- 2.8 using Wilcoxon Rank Sum).

Conclusion: Our analysis demonstrates that patients receiving pre-surgical and scheduled post-operative pain medication utilized less narcotics in than those that did not. Our research shows that scheduled pain medication can improve patient care by decreasing pain and decreasing narcotic use.

Extractoperitoneal Uterosacral Ligament Hysteropexy: A Novel Treatment for Apical Compartment Prolapse

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Study Objective: To develop and demonstrate a novel, uterine sparing extraperitoneal uterosacral ligament hysteropexy technique for treatment of mild to moderate apical compartment prolapse.

Design: Retrospective case series from 2017 to 2019.

Setting: Academic affiliated hospital.

Patients or Participants: A total of 15 patients with median pre-operative POP-Q stage 2 apical compartment prolapse desiring uterine preservation, who underwent extraperitoneal uterosacral ligament hysteropexy.

Interventions: Surgical intervention with extraperitoneal uterosacral ligament hysteropexy.

Measurements and Main Results: Baseline patient demographics included: mean age of 65 years old, history of diabetes in 3 patients (20%), and history of smoking in 4 patients (26%). The median follow-up was 24 weeks (range of 21 to 100 weeks). The surgical procedure had a mean operative time of 110 minutes with a mean estimated blood loss (E BL) of 101 ml. Concomitant procedure included anterior & posterior repairs in 15 patients (100%) and placement of mid-urethral slings in 4 patients (26%). The objective cure rate (POP-Q apical prolapse stage less than or equal to 1) was 100%. The subjective cure rate (resolution of prolapse symptoms) was 100%. During the follow-up period no patients underwent additional surgeries for recurrent prolapse. The mean loss of total vaginal length compared to baseline was 0.5 cm. One patient had a urinary tract infection within 6 weeks of the procedure (6%). No ureteral obstructions or other complications were reported during this study.
Conclusion: Short term success and low rates of complications were found following extraperitoneal uterosacral ligament hysteropexy. This procedure could serve as an alternative treatment for apical prolapse in patients desiring uterine preservation.

Ovarian Sliding Sign As a Predictor of Ureterolysis at Laparoscopy in Women with Endometriosis:
Retrospective Observational Study
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Study Objective: To determine whether a negative ovarian “sliding sign” (i.e. fixed ovary) during pre-operative transvaginal ultrasound (TVU) is useful in predicting the need for ipsilateral ureterolysis, for women with suspected endometriosis undergoing laparoscopic surgery.

Design: Retrospective observational study.

Setting: Hospital based.

Patients or Participants: 66.

Interventions: All women undergoing laparoscopic surgery for suspected endometriosis were assessed for ovarian mobility at TVU using the ovarian “sliding sign” technique. Data was analysed to determine the diagnostic accuracy of a negative ovarian “sliding sign” for the prediction of ipsilateral ureterolysis.

Measurements and Main Results: Complete TVU and surgical data was available for 66 women. The age range was from 18-52 years (Mean =31.5 years). Incidence of right left and any fixed ovary at TVU was 22/66 (33%), 24/66 (36%) and 27/66 (41%) respectively. Incidence of ureterolysis (partial or complete) at surgery for right, left and both pelvic walls was 10/66, (15%), 18/66 (27%) and 22/66 (33%) respectively. The sensitivity/specificity/positive predictive value/negative predictive value for the ovarian “sliding sign” at TVU for the prediction of ipsilateral ureterolysis was: Right: 80%/75%/36%/95% and left ovary: 44%/66%/33%/76%. The crosstab for relationship between a negative ovarian “sliding sign” of the left ovary and left ureterolysis was not significant (p=0.437) but was significant for the right ovary and right ureterolysis (p=0.002).

Conclusion: A negative right ovarian “sliding sign” (i.e. fixed right ovary) at pre-operative TVU was significantly associated with the need for right ureterolysis. In addition, a positive ovarian “sliding sign” (i.e. mobile ovaries) at TVU demonstrated a high NPV for the need for laparoscopic ureterolysis. The TVU ovarian “sliding sign” may therefore be a useful ultrasound soft marker for predicting which women are at increased risk of requiring ureterolysis at surgery, and thus, aid in the pre-operative planning and counselling for these women.

Burden of Heavy Menstrual Bleeding Associated with Uterine Fibroids: A Retrospective Analysis of a U.S. Medicaid Population
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Study Objective: Assess healthcare costs in Medicaid women diagnosed with uterine fibroids (UF) and/or heavy menstrual bleeding (HMB).


Setting: IBM MarketScan Multi-State Medicaid Database.

Patients or Participants: Women age 18-51 years were grouped into four cohorts based upon diagnosis: (a) UF only (ICD-9 218.x or ICD-10 D25.x), (b) HMB only (ICD-9 626.2 or 627.0, or ICD-10 N92.0, N92.1 or N92.4), (c) UF+HMB, and (d) controls. Cohorts were matched based upon age, race, insurance type, and Charlson Comorbidity Index. Patient and treatments characteristics at baseline (1 year pre diagnosis) and follow-up (1 year post diagnosis) were examined descriptively, differences in follow-up costs were examined using analysis of variance.

Interventions: N/A.

Measurements and Main Results: After matching, study population included 16,691 women in each cohort, with mean age of 38 years and 54% black. In the matched cohorts, a higher percentage of women with UF+HMB were diagnosed with anemia at baseline (31%), compared to women with UF only (14%) or HMB only (19%). During follow-up, 41% of the UF+HMB cohort were treated surgically, compared to 14% of women with UF only and 15% with HMB only. Among women treated surgically, 74%, 83%, and 44% of the UF+HMB, UF only, and HMB only cohorts, respectively, had a hysterectomy. Mean all-cause total healthcare costs in the UF+HMB cohort ($11,310) were significantly higher compared to costs for all other cohorts ($9,400 UF only; $9,308 HMB only; $7,255 controls; all P<0.0001). Surgical costs represented a higher proportion of UF/HMB-related medical costs for those with UF+HMB (71%) compared to those with UF only (42%) or HMB only (53%).

Conclusion: Women enrolled in Medicaid and diagnosed with UF+HMB are more frequently treated surgically and have significantly higher total healthcare costs compared to women with UF only, HMB only, or controls.

Laparoscopic Management of a Pelvic Recurrence of an Ovarian Serous Borderline Tumor
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Study Objective: To present a case in which Minimally Invasive surgery proved to be useful in a pelvic recurrence of a Serous Borderline Ovarian tumor.

Design: Case report with full description of preoperative imaging, surgical setup considerations, surgical findings, tumor management and follow up.

Setting: Private Clinic, Gynecologic Endoscopy Unit.

Patients or Participants: 48 year-old woman with a complete open surgical staging 3 years before presentation in our clinic. She had a FIGO IB Serous Borderline Tumor (IBbNO0M0). She received no adjuvant chemotherapy. Uneventful follow up with normal Ca125 and Ca19-9 levels. She complained of mild progressive defecatory discomfort for the last 6 months. MRI showed a 4.5 cm cystic lesion, subperitoneally in the pouch of Douglas, in contact with the vaginal cuff. FDG-PET/CT showed a mild increase in metabolic activity with an SUV of 3.6. She underwent an exploratory laparoscopy for secondary citorreduction. With the aid of saline filling of the bladder, a vaginal gauze pushed by a Foerster clamp to highlight the vaginal cuff apex, and a rectal probe to identify the rectal wall the cystic tumor was carefully dissected. Frozen section confirmed the absence of invasive disease, so after a complete resection of the tumor we considered there was no need for further surgery. Discharged on POD2. Received no adjuvant chemotherapy. 14 months follow up without evidence of disease and normal radiologic studies and tumor markers.

Interventions: Laparoscopic secondary citorreduction.

Measurements and Main Results: The technique showed to be feasible and useful in managing such recurrent tumor in this location.

Conclusion: We believe such tumors should be managed in this way, offering the widely accepted benefits of minimally invasive surgery while maintaining oncologic outcomes.
IgG4 Related Disease Presenting As a Solid Ovarian Mass with Ureteric and Bladder Involvement: A Case Report

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Study Objective: IgG4-related disease (IgG4-RD), a systemic immune-mediated condition, presenting as a solid ovarian mass concerning for malignancy resected using a minimally invasive approach.

Design: A case report of a 43-year-old G3P3 with a history of total abdominal hysterectomy for fibroids presenting with pelvic pain and a newly diagnosed pelvic mass on imaging. Medical history was significant for diabetes.

Setting: N/A

Patients or Participants: N/A

Interventions: The procedure performed included laparoscopic resection of the right ovarian mass, en bloc resection of the lower right ureteral, partial radical cystectomy, ureteroneocystotomy and bladder reconstruction.

Measurements and Main Results: CT abdomen and pelvis demonstrated prominent retroperitoneal lymph nodes and moderate right-sided hydronephrosis secondary to compression by the pelvic mass. Pelvic MRI demonstrated heterogeneous enhancement of the mass with possible bladder invasion. Tumor markers, CA-125 and CEA, were within normal limits. Intraoperative findings included a solid, complex right adnexal mass adherent to the right pelvic sidewall incising the right ureter with no clear ability to delineate tissue planes. In addition, the mass was found to be infiltrating the bladder around the ureteral orifice mimicking tumor invasion. Pathology report demonstrated extensive sclerosing fibrosis with ureteral obliteration, lymphohypocytic infiltrates and obliterator phlebitis highly suggestive of IgG4-RD. The pelvic washings were negative for malignant cells. On follow-up, patient with resolved pelvic pain and no evidence of recurrence on imaging. Adjuvant corticosteroid treatment was initiated by Rheumatology to reduce recurrence risk.

Conclusion: IgG4-RD is a rare diagnosis that has yet to be described as an adrenal mass. Due to the close resemblance to malignancy, recognizing this disease clinically becomes very important. Given the evidence that there is response to early glucocorticoid therapy, it is important for gynecologists to be aware of this disease to facilitate an expedited diagnosis to prevent potential unnecessary invasive procedures.

Laparoscopic Management of a Primary Posterior Cul-de-sac Abdominal Ectopic Pregnancy

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Study Objective: To report a case of laparoscopic management of a primary posterior cul-de-sac abdominal ectopic pregnancy (AEP).

Design: Video abstract.

Setting: Academic center.

Patients or Participants: A 40-year-old G5P3013 woman at approximately 7 weeks gestation who was referred to our emergency room due to abnormally rising β-human chorionic gonadotropin (hCG) levels. Transvaginal ultrasonography revealed a cystic structure measuring 2.8 × 1.6 × 1.9 cm in the posterior cul-de-sac distinct from the cervix. The mass was noted to have peripheral hypervascularity and a thickened wall. A small amount of free fluid was noted adjacent to the mass.

Interventions: Laparoscopic excision of a primary posterior cul-de-sac AEP and evacuation of hemoperitoneum.

Measurements and Main Results: The patient’s baseline β-hCG and hematocrit (HCT) was 6810.7 mIU/mL and 42.4%, respectively. Diagnostic laparoscopy revealed normal uterus, normal right ovary, normal left ovary with a corpus luteal cyst and normal bilateral fallopian tubes without dilatation or hemorrhage. The AEP was noted in the right posterior cul-de-sac and was dissected from the underlying peritoneum. The left lateral aspect of the AEP extended into the posterior vaginal wall. The patient was admitted for overnight observation and her post-operative HCT was 35.1%.

Conclusion: AEPs are extremely rare and account for 1% of all ectopic pregnancies. Approximately 90% of AEPs require surgical management. Historically, AEPs were treated with laparotomy given the high risk of hemorrhage and hemodynamic instability. However, as exemplified by the current case, laparoscopy is a safe and feasible option for the surgical management of AEPs.

Postoperative Fecal Peritonitis: Laparoscopic Approach

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Study Objective: To discuss the importance of an early diagnosis of Postoperative Peritonitis in Gynecologic Surgery.

Design: Case presentation and discussion.

Setting: Public Hospital, Gynecologic section.

Patients or Participants: 48 year old patient with recent gynecologic surgery who presented with symptoms of postoperative peritonitis (PP). Exploratory Laparoscopy was performed finding a sigmoid perforation which was repaired with double Vycril 3.0 stitches.

Interventions: Operative laparoscopy in a possible postoperative peritonitis setting.

Measurements and Main Results: Uneventful postoperative with fever resolution immediately after surgery. Recovered intestinal transit on POD2.

Conclusion: We believe laparoscopic approach is safe and feasible in patients which are developing an abdominal sepsis and still have a stable haemodynamic status. Most interventions in such scenario are successful, so early diagnosis is desirable.

Intestinal Ectopic Pregnancy

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Study Objective: The objective of the video is to share a laparoscopic approach to resection of ectopic (interstitial) pregnancy in patient with history of exploratory laparotomy, tubal ligation and reversal as well as ventral hernia repair.

Design: The patient underwent laparoscopic resection of ectopic (interstitial) pregnancy. She has been seen at a 4-week postoperative visit.

Setting: The patient is placed in the dorsal lithotomy position. Arms are tucked. A single video screen is placed at the foot of the bed. A total of 4 ports are used including three 5 mm ports and one 12 mm port (suprapubic).

Patients or Participants: The patient was selected for this surgery based on ultrasound findings and after review of her surgical history.

Interventions: Laparoscopic resection of ectopic (interstitial) pregnancy.

Measurements and Main Results: The patient presented with a right ectopic (interstitial) pregnancy. Crown rump length measured 1.65 cm. Her pre-operative hCG level was 25.634. The patient underwent laparoscopic resection of ectopic pregnancy (interstitial).

Her HCG level trended down to 4 at four weeks after surgery.
Conclusion: Resection of ectopic (interstitial) pregnancy can be performed safely using laparoscopy in patients with extensive surgical histories. In this video, we show how the pregnancy is excised, followed by curettage, and tissue removal. The suprapubic port is an effective placement for curettage of the ectopic bed as well as for suturing the uterus after resection of the ectopic pregnancy.

Major Vascular Injury (MVI) Simulation in Gynecologic Surgery: Teaching Intraoperative Crisis Management Skills
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Study Objective: To implement major vascular injury (MVI) in gynecologic surgery simulation.

Design: Development and evaluation of a gynecology-based operating room (OR) simulation.

Setting: Simulation center at the 2019 AAGL Fellowship in Minimally Invasive Gynecologic Surgery (FMIGS) Annual Bootcamp

Patients or Participants: Postgraduate year (PGY) 6 fellows participated as learners. Faculty oriented learners and lead the debriefing.

Interventions: MVI simulation session.

Measurements and Main Results: Pre- and post-simulation survey responses were compared using McNemar’ test. Median and interquartile ranges were calculated on responses collected via a Likert scale (1-5). A total of 34 fellows (median age 31.5) and 8 faculty (median age 37.5) responded. Fellows reported a median 8 hours per year spent participating in simulation team training and a median 5 hours per year spent teaching in this context. All fellows believed that simulation training is both an essential part of clinical practice and patient safety. 94.1% (n=32) thought that simulation team training should be a part of the boot camp. 94.1% (n=32) also thought that the training should be part of the fellowship curriculum in their respective institutions. Before the simulation, 97.1% (n=33) of the fellows desired to learn more about simulation training and curriculum development. Following the simulation, all fellows felt that knowledge gained could be transferred to the clinical setting, felt more confident in responding to a critical intraoperative event, learned techniques to communicate more effectively during a critical event, and felt that the simulation content was relevant to their training and clinical practice. The majority of the fellows felt more confident in managing intraoperative hemorrhage (median 5, IQR 4-5) following the simulation.

Conclusion: MVI training in gynecologic surgery is feasible and viewed favorably by participants. Further work should focus on performance assessment and clinical outcomes to allow for growth of simulation training within the field of gynecology.

Exploring the Retropubic Space: Resection of Urethral Leiomyma
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Study Objective: demonstrate the technique of developing the retropubic space, review relevant anatomy, and to discuss the differential diagnosis of a paraurethral mass.

Design: Stepwise demonstration of retropubic space dissection and resection of a urethral leiomyoma with narrated video footage.

Setting: Academic medical center.

Patients or Participants: 63 year old woman with history of hysterectomy with bilateral salpingo-oophorectomy performed for endometriosis presented with 2 years of chronic pelvic pain. The patient reported feeling constant pressure on her bladder, which was particularly noticeable when voiding.

Interventions: Robotic-assisted dissection of the retropubic space and resection of periurethral mass.

Measurements and Main Results: The periurethral mass was resected and pathology revealed benign leiomyoma. The patient had improvement in her urinary-associated pain symptoms.

Conclusion: Gynecologic surgeons should feel comfortable developing the retropubic space because this dissection is necessary for many procedures such as retropubic suspension, ureteral reimplantation, psosas hitch, and removal of retropubic mesh. Understanding anatomy maximizes safety and success when tackling unusual pathology.

Robotic Resection and Revision of Uterine Scar Defect with Hysteroscopic Guidance
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Study Objective: To demonstrate the steps of a robotic-assisted resection and revision of a uterine scar defect with hysteroscopic guidance and review tips and trips for this rare surgical procedure.

Design: This video describes the step by step approach to a robotic resection and revision of a uterine scar defect using hysteroscopic guidance to identify the target anatomy. Additionally, we describe tips and tricks to utilize while performing this rare surgical procedure to facilitate identification of the uterine scar laparoscopically, resect the defect in its entirety, improve hemostasis, and place a supportive suture for revision.

Setting: The patient was placed in dorsal lithotomy position in preparation for both hysteroscopic and robotic access.

Patients or Participants: In this surgical video, we present a case of a women with secondary infertility and a uterine scar defect in the setting of a history of prior cesarean delivery. She was referred by an REI physician due to history of aborted embryo transfers with abnormal fluid collections in the uterine defect.

Interventions: Robotic-assisted resection and revision of the uterine scar defect with hysteroscopic guidance.

Measurements and Main Results: Complete resection and reapproximation of the defect was visualized both laparoscopically and hysteroscopically without evidence of leakage of hysteroscopic fluid through the incision.

Conclusion: A minimally invasive approach to uterine scar defects can utilize simultaneous robotic-assisted laparoscopy and hysteroscopic guidance to identify the defect for resection and revision in symptomatic women or for fertility indications.

Surgical Approaches for Rectosigmoid Deep Infiltrating Endometriosis
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Study Objective: Demonstration of different surgical approaches for rectosigmoid DIE:

- Shaving of rectal nodule
- Dissection of rectovaginal septum, shaving of rectal nodule
- Discoid excision of DIE
- Resection and anastomosis of rectosigmoid endometriosis

Design: N/A

Setting: Multidisciplinary endometriosis center-University Teaching Hospital.

Patients or Participants: N/A

Interventions: Laparoscopic surgical intervention for rectosigmoid deep infiltrating endometriosis.

Measurements and Main Results: N/A
Conclusion: Minimally Invasive Surgery is the preferred surgical route for rectosigmoid endometriosis. The surgical approach should be tailored according to the pathology and patients’ symptoms and goals. Conservative surgical approach is preferred.

Laparoscopic Uterosacral Ligament Hysteropexy Techniques and Anatomy
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Study Objective: To demonstrate a technique of laparoscopic uterosacral ligament hysteropexy.
Setting: N/A
Patients or Participants: The patient is a 30 year old with Stage III apical vaginal organ prolapse. She was unsure about desire for future pregnancy and elected for uterine-sparing repair.
Interventions: The first step of laparoscopic uterosacral ligament hysteropexy involves creating peritoneal relaxing incisions between both uterosacral ligaments and the ureters. This functions to prevent ureter kinking when the uterosacral ligaments are plicated. Next, plication of the uterosacral ligament is performed using 0-Polyester suture. The suture is guided through the proximal portion of the uterosacral ligament, the midportion of the uterosacral ligament, and the insertion of the uterosacral ligament at the cervix. Uterosacral ligament plication restores the normal anatomy of the uterosacral ligaments. At the conclusion of the case, cystoscopy is performed to ensure ureteral patency.
Measurements and Main Results: N/A
Conclusion: Laparoscopic uterosacral ligament hysteropexy is a safe and effective treatment for apical pelvic organ prolapse.

Distance of Cervico-Vaginal Junction to Anterior Cul-de-sac during Vaginal Hysterectomy in Patients with and without Prior Cesarean Section
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Study Objective: Incomplete dissection of vaginal attachments to cervix during vaginal hysterectomy (VH) can lead to incorrect plane and injury to the bladder. This study aims to compare the mean distance between the cervico-vaginal (CV) incision to the anterior cul-de-sac (AC) during VH between women with and without a history of cesarean section (CS).
Design: Prospective cohort study of women who underwent VH. Intraoperative measurements taken: Distance from external cervical os to initial incision at CV, distance from CV to peritoneal entry into the AC, and distance from AC to the uterine fundus. Measurements were compared between patients with and without CS. We determined that 40 patients were needed to study our primary outcome: 20 CS and 20 non-CS.
Setting: VH performed in high lithotomy position.
Patients or Participants: Women who were undergoing VH for benign gynecologic conditions were included. Patients were excluded if gynecologic malignancy, prior vaginal or pelvic radiation, and/or presence of lower anterior uterine segment myoma.
Interventions: N/A

Measurements and Main Results: Preliminary data are presented (incomplete accrual as yet of patients due to the COVID19). Of the 35 patients with complete data, 23 (66.1%) had vaginal delivery(ies) only, 12 (32.4%) had at least one CS. The mean distance from CV to AC entry in all patients was 5.0 (1.55) cm, 5.4 (1.92) cm with CS, and 4.79 (1.31) cm without CS (p=0.27). The mean distance of the AC entry to fundus was longer in patients without CS (6.48 cm vs 4.49 cm, p=0.01). This finding remained significant when we controlled for both uterine length and weight.
Conclusion: Preliminary data suggests that in CS patients, the mean distance from the initial incision to AC tended to be greater and distance of AC to fundus was significantly shorter compared to non-CS patients.

Gender-Affirming Chest Surgery and Hysterectomy in Transmasculine Patients: Concomitant Versus Separate Surgeries
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Study Objective: To compare surgical complications and operative time in transmasculine patients receiving gender-affirming chest surgery and hysterectomy, either concomitantly or separately.
Design: Retrospective observational cohort study.
Setting: Large integrated health care system serving approximately 4.5 million members.
Patients or Participants: Patients 18 years or older undergoing gender-affirming chest surgery and hysterectomy between May 2012- December 2017.
Interventions: N/A
Measurements and Main Results: We identified 140 patients who underwent gender-affirming chest surgery and hysterectomy either on the same date (group 1) or different dates (group 2). Analysis was performed using Chi-square, Student’s T-test, with significance defined at p<0.05.
Groups 1 and 2 had similar baseline characteristics. In both groups, the majority had oophorectomy performed. The route of hysterectomy differed, with vaginal more common in group 1 (Table 1). Group 1 had longer operative times than the combined operative times of both procedures in group 2. There were no significant differences in complications between groups 1 and 2 (Table 2).
Conclusion: Compared to separate surgeries, concomitant gender-affirming surgeries had longer operating times, but no statistical difference in complications or blood loss. Thus, concomitant chest surgery and hysterectomy are reasonable to offer transmasculine patients desiring a single surgical episode.

Table 1

| Age (years)* | 30.3 | 29.7 | 0.79 |
| BMI | 27.4 | 29 | 0.27 |
| ASA category | 1.8 | 1.7 | 0.26 |
| Chest tissue weight (grams)* | 723 | 990 | 0.09 |

Oophorectomy performed

| Yes | 16 (76.1%) | 96 (80.7%) | 0.64 |
| No | 5 (23.9%) | 23 (19.3%) | 0.64 |

Route of hysterectomy

| Vaginal | 5 (23.8%) | 4 (3.4%) | 0.003 |
| Open | 1 (4.8%) | 2 (1.7%) | |
| Laparoscopic | 15 (71.4%) | 110 (92.4%) | |
| Robotic | 0 (0%) | 3 (2.5%) | |
Prevalence of and Preoperative Risk Factors for Unplanned Inpatient Admission Following Outpatient Gynecologic Surgery

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### Study Objective

We aimed to identify the prevalence of unplanned inpatient admission following outpatient gynecologic surgery. Additionally, we aimed to identify factors available preoperatively that place patients at higher risk for admission.

### Design

Retrospective cohort study.

### Setting

Academic medical center.

### Patients or Participants

Women (n=2,373) age 18 and older who underwent scheduled outpatient gynecologic surgery for a benign indication between November 2017 and September 2019.

### Interventions

Gynecologic surgery performed for benign indications.

### Measurements and Main Results

The primary outcome was inpatient admission directly following the index surgery, defined by Medicare as spending two midnights or more in the hospital. Patients who were admitted were older (median age 50 vs 42, p < .001) and were more likely to have an ASA class ≥ III (62% vs 40%, p < .001), cardiopulmonary comorbidities (62% vs. 40%, p < .001), and pain comorbidities (34% vs. 21%, p = .02). Admitted as compared to unadmitted patients more commonly underwent intra-abdominal surgery (66% vs. 44%) or pelvic surgery (28% vs. 11%, p = .03) as opposed to other laparoscopic procedures.

There were 53 (2%) admissions directly following the index surgery. In a multivariate model adjusted for age, cardiopulmonary and pain comorbidities, ASA class, and surgery performed, the following factors were significantly associated with increased odds of inpatient admission: undergoing surgery with urogynecology (aOR 4.0; 95% CI 1.7-9.6) or gynecologic oncology (aOR 3.2; 95% CI 1.3-8.1) as compared to benign gynecology and undergoing intra-abdominal surgery (aOR 10.6; 95% CI 3.2-34.9) or pelvic surgery (aOR 6.8; 95% CI 1.8-26.1) as compared to other laparoscopic procedures.

### Conclusion

The prevalence of inpatient admissions following outpatient gynecologic surgery for benign indications is low. Patients undergoing surgery with urogynecology or gynecologic oncology were at higher risk for admission, even when adjusted for age, major comorbidities, and surgery performed. Due to the overall low prevalence of the outcome, larger studies are needed to further clarify what places these patient groups at higher risk.

### In Bag Morcellation and Laparoscopic Two Port Laparoscopic Removal of Large Mucinous Cystadenoma

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### Study Objective

Demonstration of an extremely minimally invasive technique to remove a large (20cm diameter) benign ovarian tumor. The tumor is taking up essentially all of the pelvis and abdomen but our extremely minimally invasive technique is able to remove the mass with no visible scars and only two small ports.

### Design

A narrated video demonstration of the surgical procedure (Canadian Task Force Classification III).

### Setting

Large Mucinous Cystadenoma in a premenopausal female in a suburban hospital.

### Patients or Participants

Patient consented for surgical procedure, verbal and written consent for use of images. No identifying images used.

### Interventions

We created a surgical video to demonstrate the technique of removing a large mucinous cystadenoma with only two small ports. The surgery utilizes a novel technique of exteriorizing the mouth of the bag prior to manually morcellating the tumor. Other novel aspects include demonstration of a laparoscopic fluid wave and bold entry into the mass. The video has been edited to explain the important aspects of the surgery in a reasonable amount of time. The video includes explanations of the drawbacks of the technique as well as relative contraindications.

### Measurements and Main Results

We found the technique to be feasible, effective and reproducible.

### Conclusion

In properly consented patients with very little suspicion for a malignancy, our extremely minimally invasive technique may be a reasonable option to promote fast recovery and provide excellent cosmesis.

### Transumbilical Laparoendoscopic Single-Site Radical Hysterectomy without Uterine Manipulator and with Vaginal Closure

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### Study Objective

Minimally invasive surgery (MIS) of radical hysterectomy (RH) was reported with inferior oncologic outcomes according to the New England Journal of Medicine (NEJM). Then some studies suggested that the no-touch technique may be a useful procedure to prevent tumor spillage as well as improve survival, and the procedures were improved continuously. Therefore, we performed RH targeting early-stage cervical cancer through laparoendoscopic single-site (LESS) approach with enclosed colpotomy and without uterine manipulator.

### Design

A presentation of the surgery through this technical video.

### Setting

A Hospital.

### Patients or Participants

A 48-year-old postmenopausal woman was diagnosed as cervical cancer with stage IB1 (FIGO 2018).

### Interventions

After fully informed of the benefits and risks of different surgical approaches (open laparotomy and MIS), she agreed with the MIS.

### Measurements and Main Results

The type C radical hysterectomy via LESS approach was performed successfully, the final pathologic findings confirmed stage IB1 cervical carcinoma. The patient recovered fast and well with slight pain, and the incision scar was hidden perfectly for cosmetic purpose.

### Conclusion

This video demonstrated that LESS-RH with vaginal closure and without manipulator was feasible and safe. Suspension skills played a significant role in the LESS-RH. Besides, this surgery procedure also involved 4 specific techniques to prevent tumor spillage, including creation of a vaginal cuff, avoidance of interoperative uterine manipulator, standard extent and bagging of the specimen. These adaptations were meant to minimize tumor manipulation and disruption, for reducing the increased risk of recurrence. However, further verifications were still required.
Virtual Posters

Association and Management of Adenomyosis Amongst Patients with Asherman’s Syndrome

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Study Objective: To provide the first characterization of concomitant Asherman’s syndrome and adenomyosis, and subsequent obstetrical outcomes.  
Design: A retrospective cohort study from 01 January 2015 to 01 March 2019.  
Setting: A community teaching hospital affiliated with a large academic medical center.  

Patients or Participants: 227 Asherman’s syndrome patients with available hysterectomy and pelvic ultrasound reports.  
Interventions: Determinants of adenomyosis and the impact of adenomyosis on fertility and obstetrical outcomes in Asherman’s syndrome patients.  
Measurements and Main Results: A telephone survey and confirmatory chart review were conducted to obtain information on patients’ demographics, gynecologic and obstetric history, past medical and surgical history, and Asherman’s syndrome management. Adenomyosis was the most common co-occurring uterine finding, detected in 39 Asherman’s patients. The overall primary symptom was infertility. Adenomyosis patients reported a different menstrual pattern than patients with Asherman’s syndrome only. Adenomyosis prevalence trended higher with increasing Asherman’s severity, but there were no significant independent predictors of adenomyosis. In this cohort, 77 patients attempted conception and produced 87 pregnancies, 13 of which were ongoing at study conclusion. Age (OR 0.7, 95% CI 0.5-0.9) and use of assisted reproductive technology (OR 0.1, 95% CI 0.0-0.095) were negatively associated with pregnancy. Postpartum dilation & curettage/dilation & evacuation was a risk factor for miscarriage (OR 13.6, 95% CI 1.4-129.5). Age (OR 0.9, 95% CI 0.8-0.98) and severe Asherman’s disease (OR 0.1, 95% CI 0.001-0.1) were negatively associated with live birth. Adenomyosis was not an independent predictor of pregnancy rate, miscarriage rate, or live birth rate among Asherman’s patients.  
Conclusion: Adenomyosis is relatively common in Asherman’s syndrome patients. Any distinct detriment to fertility from adenomyosis may be overshadowed by the lasting effects of Asherman’s adhesions when these diseases occur together. Larger studies to establish management guidelines for concomitant disease are needed.  

Feasibility and Safety of Robotic Vaginal Natural Orifice Transluminal Endoscopic Hysterectomy for Benign Indications

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Study Objective: Hysterectomy, is mostly performed by an abdominal approach and to a lesser extent by a vaginal access, which has been proven to result in superior patients’ outcomes. The Hominis Surgical System is a novel robot-assisted system, designed specifically for robotic vaginal natural orifice transluminal endoscopic surgery (vNOTES). In the current study we aimed to present our experience in the first 30 vNOTES hysterectomies, and to assess the feasibility and safety of this revolutionary technology.  
Design: A two-center prospective study of vNOTES hysterectomy for benign indications.  
Setting: N/A  
Patients or Participants: Thirty women aged 38 to 79 years, BMI 18-40 kg/m².  
Interventions: vNOTES hysterectomy.  

Measurements and Main Results: Intraoperative and postoperative complications, median blood loss, duration of surgery and postoperative pain. All procedures were completed successfully without conversions to open surgery. No intraoperative complications were observed. Median blood loss and procedure duration were 50 ml (range: 20-400) and 41 minutes (range: 24 to 88), respectively. Postoperative pain was minimal with a median VAS of 3 (range: 1-5) The vaginal cuff was fully healed in all women at the 6-week post-operative follow up visit.  
Conclusion: This is the first publication regarding a robot-assisted vaginal hysterectomy. The combined advantages of the vNOTES approach with robotic instrumentation have the potential to shift the trend from abdominal to vNOTES approach for a wide variety of gynecological and non-gynecological surgical procedures.  

Pregnancy Following Cesarean Scar Defect (niche) Repair

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Study Objective: To report pregnancy success rate and pregnancy outcome in women following cesarean scar defect (niche) repair.  
Setting: Single medical care center.  
Patients or Participants: All women after laparoscopic niche repair done by a single high skilled surgeon, during the study period.  
Interventions: Data was collected from women’s medical records and a telephone interview was performed to assess further symptoms and attempts to conceive, including pregnancy outcomes.  
Measurements and Main Results: During the study period 48 women underwent laparoscopic niche repair, of them complete follow-up was achieved for 37 (78.7%) women. Median age was 35 years (IQR 32-39) with median of one cesarean delivery in the past (IQR 1-1). The median residual myometrial thickness measured by ultrasound before the repair was 2.0 mm (IQR 1.4-2.5). Attempts to conceive were reported by 81% (n=30) of the women, while 18 (60%) achieved pregnancy in median time of 6 month (IQR 5-12) post niche repair. 14 (78%) of the women conceived spontaneously. No placental abnormalities were reported in any of the women. All gave birth by cesarean delivery at a median of 38.4 gestation week (IQR 37.0-39.5). No uterine dehiscence or rupture were reported.  
Conclusion: Pregnancy following cesarean scar defect repair can be achieved with low pregnancy complication rate and good pregnancy outcomes. Further studies need to be done in order to strengthen our findings.  

Minimally Invasive Search for a Missing Vibrator

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Study Objective: To demonstrate a unique case study focusing on the location of a lost Vibrator.  
Design: A narrated video demonstration of the surgical procedure (Canadian Task Force Classification III).  
Setting: 29-year-old gravida 1 para 0-1-0-0 Ab1 white female presented to the emergency room at approximately 1 AM after reporting that she lost her
vibrator during sexual activity and could not find it. The patient remarks that she was using the vibrator for direct clitoral stimulation when her partner suddenly initiated vaginal intercourse. The patient remarks that she was uncertain of the location of the vibrator and felt some discomfort briefly, but believed that the vibrator was intravaginal as the intercourse took place. Following the vaginal intercourse the patient was unable to find a vibrator in her vagina but still had the vibration sensation within her pelvis. When the patient was unable to find vibrator she presented to the emergency room. She remarks that the vibration in her pelvis lasted for approximately 30 minutes until stopping, presumably when the batteries lost all charge. A flat plate x-ray of the patient’s pelvis showed the vibrator to be approximately at the level of the patient’s intrauterine device in the pelvis. The vibrator was also in a horizontal position. Careful questioning of the patient showed that the vibrator was of an unusual type of unusually narrow diameter at approximately 1.2 cm. The device is approximately 10 cm long and is designed to be worn on a chain around the neck as a necklace to maximize the convenience of vibrator usage. The necklace is detachable in order to use the vibrator for sexual activities.

Patients or Participants: Single Case Study, no identifying information.

Interventions: Laparoscopy and Cystoscopy performed.

Measurements and Main Results: Device ultimately found to be in the bladder.

Conclusion: Detailed knowledge the nature of a foreign body can be invaluable in planning and performing the surgical removal.

Systematic Review and Meta-Analysis of Surgical Interventions of Adnexal Masses in Pregnancy

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Study Objective: To compare maternal and fetal outcomes in laparoscopy versus laparotomy in the surgical management of adnexal masses in pregnancy.

Design: Systematic Review and Meta-Analysis. 8027 titles and abstracts were screened, followed by 691 full articles. Ten retrospective studies were included in the meta-analysis.

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: 287 women underwent laparoscopy and 496 underwent laparotomy. The median age undergoing laparoscopy versus laparotomy was similar (27.7 years and 27.3 years, respectively, p=0.80), as was the mean gestational age at time of surgery (16.0 weeks in laparoscopy and 15.6 weeks in laparotomy, p=0.59). The median size of the mass was 7.8 cm in laparoscopy and 9.1 cm in laparotomy (p=0.07). The most common pathology was dermoid (36%) and the overall risk of malignancy was 1%. Women undergoing laparoscopy were less likely to have a preterm delivery (OR 0.72 [0.33, 1.45]). However, laparoscopy was more likely to result in spontaneous abortion (OR 1.67 [0.67, 4.33]). Operative time was increased by 12.6 minutes in laparoscopy as compared to laparotomy (median 76.6 minutes vs 64.0 minutes, p=0.05). The Estimated blood loss (EBL) was lower in laparoscopy by 26.6 mL (median 49.8 mL for laparoscopy versus 75.5 mL for laparotomy, p=0.05). The median length of hospital stay (LOS) was 2.8 days for those undergoing laparoscopy versus 5.8 days for laparotomy (p<0.001).

Conclusion: Laparoscopy for the surgical management of adnexal masses is associated with a lower EBL and reduced LOS. There is no statistically significant difference in the odds of preterm delivery or spontaneous abortion in laparoscopy as compared to laparotomy. Additional surgical complications and fetal outcomes of interest were not compared due to heterogeneity of the included articles. Laparoscopy is a safe alternative to laparotomy for the surgical management of adnexal masses in pregnancy.

Sock Laparoscopy: Very Low-Fidelity Simulation to Develop Advanced Skills

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Study Objective: Demonstrate the construction and use of very low-fidelity simulation to practice advanced laparoscopic skills in gynecologic surgery.

Design: Educational demonstration using affordable materials and a basic laparoscopic box trainer.

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: N/A

Conclusion: Laparoscopic surgical training is an important aspect of OB/GYN residency and successful completion of the Fundamentals of Laparoscopic Surgery is now required. A laparoscopic box trainer provides a platform for practicing basic and advanced laparoscopic skills. Very low-fidelity models can be quickly created using inexpensive material to simulate more advanced skills such as vaginal cuff closure, cystotomy repair, myometomy closure with baseball stitch of the serosa, bowel serosa repair, ovarian cystectomy, and peritoneal biopsy.

Minimally Invasive Surgical Approaches for Broad Ligament Fibroids

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Study Objective: Demonstration of different minimally invasive surgical approaches for broad ligament myoma

Design: N/A

Setting: University teaching hospital.

Patients or Participants: N/A

Interventions: Minimally invasive surgical approach was tailored according to the anatomical location of the fibroid, and the patients’ fertility desires.

Measurements and Main Results: N/A

Conclusion: Broad ligament myomas present a challenging situation to surgeons. Surgeons should tailor their approach according to the anatomical location of the myomas. MIS is a feasible and safe approach for surgical management of broad ligament myomas.

Spinal Anesthesia Versus General Anesthesia for Single Port Access Laparoscopic Adnexal Surgery: A Propensity Score-Matching Analysis

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Study Objective: The purpose of this study was to compare the surgical outcomes of single-port-access(SPA) laparoscopic adnexectomy under spinal anesthesia and general anesthesia and to evaluate the feasibility of laparoscopic adnexectomy under spinal anesthesia.

Design: Canadian Task Force Classification II-1, This study was conducted at Wonju Severance Christian Hospital from March 2017 to September 2019.

Setting: N/A

Patients or Participants: Total 111 patients were enrolled prospectively.

Interventions: All patients underwent SPA laparoscopic adnexal surgery (Bilateral or unilateral salpingo-oophorectomy); 89 patients under general anesthesia and 22 patients under spinal anesthesia. To reduce the effect of selection bias and potential confounding in this study, estimated propensity scores were used to match the spinal anesthesia group to the general anesthesia group.
Measurements and Main Results: Patient characteristics showed no statistical difference between 2 groups. The postoperative pain 6 hours after operation was significantly higher in spinal anesthesia group (2.78 ± 0.78 vs. 3.80 ± 1.99; p = 0.035). The postoperative pain after 2, 12, 24, 48 hours showed no significant difference between 2 groups. The use of patient controlled analgesia (78.6% vs. 23.8%; p < 0.001) and opioids (42.9% vs. 28.5%; p = 0.001) was significantly lesser in spinal anesthesia group. The postoperative nausea/vomiting 2, 6, 12, 24, 48 hours after operation showed no significant difference. However, the use of antiemetics immediately after operation was significantly lesser in spinal anesthesia group (38.1% vs. 0%; p = 0.001). Other surgical outcomes including hemoglobin change, time to gas out, time to ambulation, hospital day showed no significant difference between 2 groups. One patient was excluded from the study because of spinal failure.

Conclusion: Performing SPA laparoscopic adnexal surgery under spinal anesthesia is feasible. And spinal anesthesia can be another option while performing laparoscopic surgery in gynecologic field.

Laparoscopic Sacrocolpopexy Mesh Removal for Immediate Onset of Pelvic Pain after Operation
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Study Objective: To demonstrate laparoscopic excision of sacrocolpopexy mesh for persistent pelvic pain immediately onset after operation.

Design: Case report.

Setting: University hospital.

Patients or Participants: A 62-year-old woman from China.

Interventions: Laparoscopic resection of sacrocolpopexy mesh.

Measurements and Main Results: The patient complained immediate onset of pelvic pain after a laparoscopic hysterectomy, bilateral salpingectomy, and sacrocolpopexy for middle compartment pelvic organ prolapse 2 years earlier. A polypropylene mesh was used in the operation. The pain was obvious when walking and doing housework, especially when the hands were raised over the head, and relieved when resting or lying still. She had no sex for 2 years. Physical examination revealed excessive tensioning of mesh. MRI suggested no evidence of bowel obstruction, osteomyelitis, and mesh infection or exposure. At laparoscopy, a well-reperitonealized mesh was noted to begin in the vaginal vault and be fixed to the sacrum at S1 along the right pelvic wall (lateral to the uterine sacral ligament), with excessive tensioning. Surgical steps begin with laparoscopic survey of the anatomy, followed by release of adhesions. After carefully dissecting the right ureter, the mesh was transected close to the sacral promontory and resected at the level of the vaginal cuff angles. A small portion of the mesh was left to fix the vaginal vault to the right pelvic wall. The operative time was 90 min, with 20 ml blood loss. There were no complications. She was discharged on post-operative day 2. On follow-up one month later, there was complete resolution of her symptoms, and 8 months till now with no vault descent.

Conclusion: This video demonstrates the steps required to perform a partial laparoscopic sacrocolpopexy mesh excision. This may provide a feasible treatment strategy for similar patients in the future.

Patient Reported Menstrual and Obstetrical Outcomes Following Office Based Hysteroscopic Lysis of Adhesions for Asherman’s Syndrome
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Study Objective: To understand the impact of hysteroscopic adhesiolysis on menstrual and obstetrical outcomes amongst Asherman’s syndrome patients when stratified by disease severity using the March classification system.

Design: A retrospective cohort study.

Setting: A community teaching hospital affiliated with a large academic medical center.

Patients or Participants: A total of 355 Asherman’s syndrome patients who underwent hysteroscopic adhesiolysis from 01/01/2015 - 03/01/2019.

Interventions: Hysteroscopic adhesiolysis followed by telephone survey to determine menstrual and obstetrical outcomes.

Measurements and Main Results: A total of 150 (42.3%) patients completed the telephone survey with a mean follow-up of 2.21 years. They were representative of the clinic population, and comprised of 40.6% with mild, 52.7% with moderate, and 6.7% with severe Asherman’s syndrome. Amenorrhea was reported at initial evaluation in 23.8% of all patients, with no significant difference by March classification. However, there was a significant difference in the resolution of amenorrhea with 93.7%, 85.0%, and 50.0% of mild, moderate, and severe Asherman’s syndrome patients endorsing a return of menstruation following treatment. The cumulative pregnancy rate was 81.9%. There was no significant difference in live birth rate with 50.9%, 54.6%, and 16.7% amongst the mild, moderate and severe Asherman’s syndrome patients. March classification was not a predictor for ≥1 pregnancy or ≥1 live births when adjusted for confounders using multivariable logistic regression modeling. March classification was a predictor of ≥1 miscarriage in moderate disease when compared to mild cases (95% CI 0.1 - 0.8, P-value < 0.05).

Conclusion: The patient reported return of menstruation as well as the pregnancy rate following hysteroscopic adhesiolysis of Asherman’s syndrome patients are both promising, however not well predicted by the March classification system.

A Stepwise Approach to Broad Ligament Fibroids
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Study Objective: To demonstrate a stepwise laparoscopic approach to patients with broad ligament fibroids.

Design: N/A

Setting: Patient with a broad ligament fibroid undergoing total laparoscopic hysterectomy in a community hospital.

Patients or Participants: The patient is a 48-year-old female with a symptomatic fibroid uterus undergoing definitive surgical management with laparoscopic hysterectomy.

Interventions: The anatomically normal side of the hysterectomy was completed first. On the affected side, the uterine artery was ligated at its origin. The ureter was mobilized to allow safe dissection of the fibroid out of the pelvic side wall and completion of the hysterectomy.

Measurements and Main Results: N/A

Conclusion: Having a framework approach for patients with broad ligament fibroids enhances the safety and success of managing uncommon anatomic variants.

Operative Times of Robotic Hysterectomy Versus Other Modalities
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Study Objective: Previous studies demonstrate that robotic surgeries have significantly longer operative times with minimal difference in outcomes. This argument has led to surgeons choosing other modalities over robotic surgery. However, these studies typically examine case operative times during a robotic surgeons’ training period. The aim of this study is to compare robotic hysterectomy data from an expert robotic surgeon to historical data of non-robotic hysterectomies.

Design: This study pools operative times from consecutive robotic hysterectomies performed by a surgeon who has been performing robotic
hysterectomies for over ten years. The data was compared to the Premiere database. No postoperative follow-up data was reviewed for this study.

**Setting:** All patients had benign indications for hysterectomy.

**Patients or Participants:** Data was collected from 200 consecutive robotic cases. Cases were excluded if the primary surgery was not a hysterectomy and if operative times were not properly documented. Out of the 200 cases, 78 cases met criteria. These cases were compared to non-robotic hysterectomies from the Premiere database, which included 289,875 cases.

**Interventions:** The primary surgery performed was a robotic hysterectomy.

**Measurements and Main Results:** The primary comparison was skin-to-skin operative time. Surgical complexity was accounted for by comparing primary surgery, number concomitant surgeries, concomitant surgery type, and resident involvement. Preliminary results show significantly faster operative times with the robot. The average robotic skin-to-skin operative time was 96 minutes; whereas, the average non-robotic skin-to-skin operative time was 130 minutes for vaginal, 147 minutes for abdominal, and 164 minutes for laparoscopic.

**Conclusion:** Our study demonstrates that an expert robotic surgeon’s operative times were significantly faster to other modalities. With decreased operative times, demonstrated decreased estimated blood loss, and length of hospitalization with robotic surgeries, it is fair to suggest that robotic surgeries, if available, can be considered over other modalities given the associated benefits of robotic surgery.

**Success Rates and Outcomes of Laparoscopic Mesh Sacrohysteropexy**

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**Study Objective:** This study aimed to evaluate the impact of laparoscopic mesh sacrohysteropexy on symptomatic prolapse from an Australian experience.

**Design:** Retrospective cohort study.

**Setting:** Private Practice.

**Patients or Participants:** 157 patients with symptomatic prolapse underwent laparoscopic mesh sacrohysteropexy between 2007-2017.

Choice of surgery was determined by the patient, after discussion about hysterectomy, future fertility, and uterine conservation. Patients electing for laparoscopic sacrohysteropexy were women with symptomatic prolapse wishing to preserve their uterus and had failed conservative measures. Exclusions to uterine preservation or complex laparoscopic surgery included significant uterine enlargement (>280cc), body mass index (BMI) >35, current cervical smear abnormalities and concomitant medical conditions that would preclude a laparoscopic approach for anaesthetic concerns.

**Interventions:** Laparoscopic mesh sacrohysteropexy.

**Measurements and Main Results:** The median age was 58 years (27-86 years), median parity was 2 (0-6), and median BMI was 26.8 (23-29.9). 134 women had a laparoscopic hysterectomy and concurrent vaginal prolapse repair and 4 women had an isolated laparoscopic hysterectomy. The mean preoperative point C was 0.60. The mean change from preoperative point C to postoperative point C was 7.6 cm (p < 0.01). Of the 136 patients (98.6%) seen at 4-6 weeks post-operative, all had Stage 0 POP-Q score. Prolapse recurrence was observed in 22 patients, while 116 patients remained cured at 4-6 weeks post-operative, all had Stage 0 POP-Q score. Prolapse recurrence was observed in 22 patients, while 116 patients remained cured at 4-6 weeks post-operative.

**Conclusion:** Laparoscopic mesh sacrohysteropexy is an effective and safe procedure with a high success rate comparable to available international data and should be considered as an alternative to hysterectomy in women with a Stage II or III pelvic organ prolapse.

**A Novel Resident Robotic Curriculum Using Self-Selection for Advanced Training and a Single Web-Based Tool for Feedback and Case-Tracking**

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**Study Objective:** Describe a novel two-phase robotic curriculum facilitated by a web-based feedback and case-tracking tool, which allows residents to self-select into advanced training.

**Design:** Descriptive.

**Setting:** Academic Hospital.

**Patients or Participants:** OB/GYN residents and faculty.

**Interventions:** Phase I (Basic), required of all residents, includes online training modules, assessment, and robotic dry lab. Phase II (Advanced) console training is elective. Residents complete 10 SIM drills to proficiency before performing live surgery. A web-based tool is used for surgical feedback. Resident online assessments, SIM lab reports, feedback, and case-logs were reviewed (7/2018-6/2019). Attendings and residents completed a beta-tested satisfaction survey.

**Measurements and Main Results:** All 24 residents completed Phase I training. Phase II was initiated by 12 residents and 10/12 (83.3%) completed all 10 SIM drills. A median of 10.362 attempts were required to complete each drill with a mean time of 5.1hrs to complete all drills. 128 web-based post-surgical feedback entries were completed. Residents performed as bedside assistants (75%, n=96), console surgeon (5.5%, n=7), or both (19.5%, n=25). Most common tracked procedure was hysterectomy (111/193 [57.5%]). Console surgeons performed 32 cases with a mean console time of 346±19.5min. Most common procedure steps included: colpotomy/cuff closure 31.1%, uterine artery 75% and utero-ovarian vessel seal/transaction 84.4% (n=52), 28/32 (87.5%) Global Evaluative Assessment of Robotic Skills (GEARS) assessments were completed. Mean GEARS score 20.6±3.7 (n=28), communication (4.2±0.8, n=61), workload management (3.9±0.9, n=54), and team skills (4.3±0.8, n=60). Residents completing >50% of cases were assessed as “apprentice” 38.5% or “competent” 23.1% (n=13), 27/44 (61.4%), satisfaction survey response rate. After curriculum change, attendings considered residents prepared as bedside assistants and console surgeons (100%), whereas only 16.7% were prepared before (n=6). Respondents were satisfied with the curriculum (95.0%), found the web-based tool helpful to give/receive feedback (90.0%), and recommended continued use (90.0%) (n=19).

**Conclusion:** This novel robotic curriculum allows residents to self-select into advanced training. A web-based tool improves individualized feedback and case-tracking alleviates many challenges of graduated robotic training.

**Two Surgical Approaches to the Removal of the Essure Contraceptive Device**

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**Study Objective:** We first review the Essure contraceptive device composition in order to aid in the understanding of proper removal. We present two safe and effective techniques for Essure removal and demonstrate the importance of individualizing and modifying the surgical approach based on intraoperative findings.

**Design:** Video presentation of techniques of Essure removal.

**Setting:** An ambulatory surgery center associated with an urban academic medical center.

**Patients or Participants:** Demonstration of presented techniques in a 35-year-old multiparous patient with bilateral Essure device in place for five years, complaining of pelvic pain and dyspareunia, desiring removal of the device.

**Interventions:** Laparoscopically, the Essure device was palpated in the right fallopian tube and a salpingostomy was created, revealing the Essure coils. The device was grasped and taking care to stabilize the proximal tube and avoid excess traction, the coils were extracted until all parts were accounted for. Attention was then turned to the left fallopian tube; the Essure device was not palpable and thus the decision was made to proceed with hysteroscopic
removal. Hysteroscopically, the device was seen at the left tubal ostia and using grasping forceps the Essure device was removed from the tube. All components of the Essure device were accounted for and complete removal was ensured.

**Measurements and Main Results:** N/A

**Conclusion:** Successful removal of the Essure contraceptive device may be performed by a laparoscopic or hysteroscopic approach. The choice of technique may need to be modified based on surgical intraoperative findings. Therefore, familiarity with various surgical approaches in addition to knowledge of the structure of the Essure device is critical to ensure complete removal.

### Laparoscopic Repair of Subacute Uterine Inversion by Haultain’s Technique: A Case Report

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**Study Objective:** To show that Laparoscopic approach is beneficial for surgical repair of uterine inversion cases.

**Design:** A case report.

**Setting:** Pandit Hospital and Laparoscopy centre, Ahmednagar, India.

**Patients or Participants:** A 26 year female presented with subacute uterine inversion in January 2020.

**Interventions:** Laparoscopic Haultain’s repair for subacute uterine inversion.

**Measurements and Main Results:** Although in modern era, endoscopy has replaced abdominal or vaginal surgeries, there is hardly any case report of laparoscopic management of uterine inversion. Here, we report a case of successful management of subacute uterine inversion by Laparoscopic approach by Haultain’s technique, which is done for the first time as per our knowledge and no such case of laparoscopic repair is been mentioned in the literature. A 26 year old P2L2, presented on seventh day postpartum with complaints of continuous bleeding per vaginal and fever. Patient was febrile with temperature of 99 F with tachycardia. On per abdominal examination, uterus was much below the umbilicus and indentation was felt at the level of fundus. On per speculum examination, endometrium was seen protruding outside, so inversion of uterus was suspected which was confirmed on ultrasonography of pelvis. Before going for the Laparoscopy, manual reposition of uterus was tried under general anaesthesia but was not successful. During Laparoscopic Haultain’s repair, posterior wall of uterus was incised at the rim. By continuous upward traction on bilateral round ligament, inversion was corrected. Uterine incision was closed in double layer. Patient was asymptomatic on discharge and on follow up examination after seven days and one month.

**Conclusion:** Uterine inversion cases can be managed laparoscopically without any harmful effects and with added benefits of laparoscopic route as for any other procedure.

### Is Preprocedural Anxiety a Risk Factor for the Perception of Severe Pain during an Office Hysteroscopy?

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**Study Objective:** To determine if preprocedural anxiety is an independent risk factor for patients’ perception of severe pain during office hysteroscopy.

**Design:** An observational, prospective, cohort study has been designed. Patients included in the study are divided into two cohorts based on their exposure or non-exposure to the risk factor under study, that is, based on preprocedural anxiety evaluation using the validated questionnaire of STAI-S. We will consider that the patient is exposed to the risk factor when the score on STAI-S is ≥ 30. After hysteroscopy, we evaluated the pain perceived by the patient during the procedure using a VAS score (0-10). We consider that the patient has perceived severe pain if the score is ≥ 7.

**Setting:** At the office, the patient was placed in a lithotomy position and we performed a paracervical block with 2% mepivacaine. The interventions were performed with a Gubbini® Mini-Hystero-Resectoscope.

**Patients or Participants:** We have included 178 patients (64 in the exposed cohort and 114 in the non-exposed cohort) in whom we performed an outpatient hysteroscopy between August 2019 and February 2020.

**Interventions:** Patients undergoing office polypectomy, myomectomy and endometrial biopsy have been included.

**Measurements and Main Results:** We have determined if there is an association between preprocedural anxiety and the perception of severe pain during an office hysteroscopy by calculating the Risk Ratio [6.61 (CI95% 1.94 – 6.96) with a p<0.001]. We have determined if there is a correlation between STAI-S and VAS score by calculating Pearson’s coefficient: r = 0.661 (p= 0.021).

**Conclusion:** We can conclude that preprocedural anxiety is a risk factor for perceiving severe pain during a hysteroscopy in the office. The STAI-S score has a direct correlation with the VAS score after hysteroscopy.

### The Use of Barbed Suture for Cystotomy Repair — a Novel Approach

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**Study Objective:** In this study, we aim to compare outcomes after cystotomy repair between standard sutures (910 poliglecaprone barbed suture) versus barbed (V-Loc TM 90) suture. As a secondary outcome, we analyzed risk factors for suture preference between the two groups.

**Design:** Retrospective cohort study.

**Setting:** N/A

**Patients or Participants:** Surgeries complicated by cystotomy, identified by ICD-9/10 codes from 2016 to 2019 at West Virginia University (WVU) Hospital.

**Interventions:** Comparisons were made between cystotomy repair using barbed suture versus standard braided suture. Injuries were categorized by procedure, surgeon specialty, surgical route, type of suture used in repair, and subsequent complications related to repair. Primary endpoints were examined by Pearson’s Chi-square test and interval data by t-test. A p value < 0.05 was significant.

**Measurements and Main Results:** Sixty-eight patients were identified with iatrogenic cystotomy at WVU. Barbed suture was used for cystotomy repair in 11/68 (16.2%) patients. No significant difference was seen in postoperative outcomes between patients repaired with barbed suture versus standard braided suture. Barbed suture was significantly more likely to be used for cystotomy repair in minimally invasive surgery (p< 0.001). It was most often utilized in a robotic approach 7/11 (63.6%) followed by laparoscopic 3/11 (27.3%). Body mass index was significantly higher in patients receiving a barbed suture repair (p=0.005).

**Conclusion:** Barbed suture is not inferior to standard braided suture for cystotomy repair and does not cause an increase in complication rate. Barbed suture offers a practical alternative to facilitate cystotomy repair in minimally invasive surgery, especially in patients with a high BMI.
Robotic Lymph Node Resection Off the Aortic Bifurcation for Presumed Recurrence Management of Advanced Ovarian Cancer
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Study Objective: To describe a surgical video where-in lymph node resection was performed robotically in a patient with presumed ovarian cancer recurrence.

Design: Case report and a step-by-step video demonstration of robotic lymph node resection off of the aortic bifurcation (Canadian Task Force classification III).

Setting: Tertiary referral center.

Patients or Participants: 42-year-old female with stage III A1 high-grade serous ovarian adenocarcinoma.

Interventions: 42-year-old female was diagnosed with stage IIIA1 high-grade serous ovarian adenocarcinoma in 2018 when she underwent upfront optimal cytoreductive surgery, inclusive of extensive debulking of aortocaval lymphadenopathy. The patient remained disease free until February 2020, when surveillance imaging showed a single hypermetabolic lymph node, anterior to the left common iliac artery. She was taken to the operating room for robotic debulking.

Robotic trocars were placed on a horizontal line along the umbilical fold. Exploration of the peritoneal cavity revealed no evidence of disease. There was some adhesive disease over right pelvic sidewall and distal small bowel mesentery was overlying the aortic bifurcation. These adhesions were taken down by paying meticulous attention in order not to injure the small bowel mesentery. The retroperitoneum was explored to the level of the third part of the duodenum. Aortocaval lymph node basins were explored. The IMA was skeletonized and left ureterolysis was performed; allowing safe access to the left para-aortic as well as to the presacral area. The suspicious lymph nodes, including the one which correlated with the hypermetabolic left common iliac lymph node were resected without any complications.

Measurements and Main Results: Successful robotic secondary debulking was performed. The patient was discharged home on postoperative day 0. Pathology of the suspicious lymph nodes were negative for malignancy. Therefore, the patient was deemed free of disease and has been scheduled for surveillance imaging in three months.

Conclusion: Robotic secondary debulking of presumed ovarian cancer recurrence is feasible and should be considered in selected patients.

Laparoscopic Repair for Full Thickness Resection of Diaphragm Metastases in Ovarian Cancer
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Study Objective: To describe the laparoscopic surgical technique to safely repair a full thickness diaphragm ovarian cancer resection, as well as the intraoperative trans-diaphragmatic pneumothorax decompression and lung re-expansion technique. Additionally, the role of minimally invasive surgery to resect diaphragm metastases in ovarian cancer will be discussed.

Design: Surgical educational video.

Setting: Tertiary care center at an academic institution. Operating room procedure with patient on lithotomy with reverse Trendelenburg position and a leftward tilt.

Patients or Participants: Case description of a 39-year-old patient with stage IIB high grade serous carcinoma of the ovary who presented for interval debulking surgery.

Interventions: Laparoscopic cytro-reduction with resection of diaphragmatic metastases. This video emphasizes the most important surgical steps to safely perform a minimally invasive full thickness right hemi-diaphragmatic defect repair after resection of full thickness ovarian cancer metastases. A trans-diaphragmatic lung re-expansion technique using a suction catheter with purse string suture and Valsalva is shown.

Measurements and Main Results: N/A

Conclusion: Laparoscopic resection of diaphragm metastases with intraoperative trans-diaphragmatic pneumothorax decompression is feasible and safe in selected patients. Surgical expertise with adequate laparoscopic needle handling is necessary for a safe repair.

Fundamentals of Laparoscopic Surgery Pro Tips Series Part 2: Tasks # 4 & 5
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Study Objective: This objective of this video is to describe several tips and tricks to improve technical skills and efficiency during the Fundamentals of Laparoscopic Surgery (FLS) exam. In part 2 of this 2-part series, we provide specific strategies for the residents to gain skills and confidence during the suturing and knot tying tasks.

Design: Educational instructional video.

Setting: N/A

Patients or Participants: N/A

Interventions: FLS uses five simulation stations to assess basic laparoscopic surgery skills. It is a reliable and valid curriculum which has been shown to improve intraoperative trainee performance. FLS was developed in 2004, and since 2009 has been a requirement to qualify for the American Board of Surgery board certification. In 2018, the American Board of Obstetrics and Gynecology (ABOG) announced that FLS will be a prerequisite for specialty board certification for obstetrics and gynecology residents graduating after May 2020. ABOG states that this will “ensure that diplomates possess critical skills for the contemporary practice of obstetrics and gynecology.”

Measurements and Main Results: N/A

Conclusion: FLS is now a requirement for all OB/GYN residencies. Mastering the skills requires time and effort on the part of the learners, but using these pro tips can help gain confidence and improve efficiency.

The Effect of Abuse History on Preoperative and Postoperative Pain Symptoms in Women Undergoing Surgical Treatment of Endometriosis
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Study Objective: To assess the association between abuse history and pain symptoms in women undergoing surgery for endometriosis.

Design: Retrospective cohort study.

Setting: N/A

Patients or Participants: 140 women with pathology-proven endometriosis who underwent laparoscopy for excision of disease from 09/2015-11/2018.
Interventions: Data (type/timing of abuse, pre-operative symptoms, intraoperative findings and responses to surgical treatment) were collected using a standardized form at presentation and six weeks after surgery.

Measurements and Main Results: Of 140 women, 56 (40%) had a history of emotional, physical, or sexual abuse. Overall preoperative pain score was higher in women with a history of abuse: sexual (6.8 vs. 5.5, p=.039), physical (6.6 vs. 5.4, p=.047) and emotional (6.8 vs. 5.4, p=.006) though both groups had comparable intraoperative findings. Both groups had similar overall improvement of post-operative pain (table 1). Results remained unchanged after adjusting for potential confounders (pre-operative hormone use, surgical time, concomitant hysterectomy and/or bowel surgery, presence of deeply-infiltrating endometriosis or obliterated pouch of Douglas). Women who reported any abuse had higher pre-operative pain at ovulation (6.4 vs. 5.1, p=.020), post-operative pain with full bladder (2.2 vs. 1.2, p=.024), pain with urination (1.5 vs. 0.6, p=.007), and continued migraine headaches (3.1 vs. 1.4, p=.006). These differences were more pronounced with sexual or physical abuse in childhood compared to adulthood.

Conclusion: Women with a history of abuse had differences in preoperative presentation and postoperative outcomes, with the type and timing of abuse potentially playing a role. These results inform counseling women with this history on potential outcomes of endometriosis surgical interventions.

Table 1. Change in pain after endometriosis excision

<table>
<thead>
<tr>
<th>Post-op – pre-op scores</th>
<th>Abuse History</th>
<th>No Abuse</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abuse</td>
<td>n=56</td>
<td>n=84</td>
<td></td>
</tr>
<tr>
<td>Overall pain</td>
<td>-3.3±2.6</td>
<td>-2.4±2.4</td>
<td>0.20</td>
</tr>
<tr>
<td>Ovulation</td>
<td>-4.0±4.0</td>
<td>-3.2±2.8</td>
<td>0.27</td>
</tr>
<tr>
<td>Before period</td>
<td>-4.3±3.8</td>
<td>-4.2±3.6</td>
<td>0.88</td>
</tr>
<tr>
<td>During period</td>
<td>-5.2±4.1</td>
<td>-4.9±3.6</td>
<td>0.60</td>
</tr>
<tr>
<td>Deep-pain with sex</td>
<td>-4.6±4.1</td>
<td>-3.4±3.9</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Laparoscopic Cervical Myomectomy with PRE-Operative Uterine Artery Embolization and Concomitant Abdominal Cerclage: A Case Report

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Study Objective: To describe the minimally invasive surgical management of a large cervical leiomyoma in a woman wishing to preserve her fertility. To consider the feasibility of adjuvant uterine artery embolization as an alternative to ligation of uterine arteries. To discuss the indication of concomitant cervical cerclage.

Design: Case report.

Setting: N/A

Patients or Participants: A 30-year-old nulligravida with a 12 cm cervical leiomyoma diagnosed at ultrasonography and magnetic resonance imaging.

Interventions: After failure of multiple medical therapies and uterine artery embolization to treat severe heavy menstrual bleeding and pelvic pain, a laparoscopic cervical myomectomy was performed. We describe several interventions in order to reduce blood loss, identify anatomic structures and prevent cervical incompetence in subsequent pregnancies.

Measurements and Main Results: A large cervical leiomyoma was successfully removed and concomitant laparoscopic cerclage was performed, in order to prevent cervical incompetence. Adjuvant pre-operative uterine artery embolization using gelatin sponges was used to reduce surgical blood loss.

Conclusion: Adjuvant pre-operative uterine artery embolization with gelatin sponges is an alternative to intra-operative ligation of uterine arteries when access to the retroperitoneum is limited by the size and location of leiomyomas. In cases of cervical myometomy, concomitant placement of a cerclage should be considered when the integrity of the cervix has been compromised by the surgery.

Simulation for Use of a 30-Degree Laparoscope in Gynecologic Surgery

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Study Objective: Many methods of simulation exist in the field of obstetrics and gynecology, focusing primarily on procedural steps, anatomical identification, and/or technical skills. There are limited available training options for the utilization of a 30-degree laparoscope, a critical component of performing complex gynecologic surgery. As a result, the learner and teacher may experience inefficiency, frustration, and ultimately avoidance of its use, thereby limiting the number of potential minimally-invasive surgical candidates. We sought to develop a reproducible model to aid in the simulation of a subtle but critical aspect of gynecologic surgery.

Design: N/A

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: We briefly review a case in which a 30-degree laparoscope was required to perform the procedure. Using a box trainer, a balloon, and PVC tubing, we re-created the anatomy seen in an enlarged uterus. The bulky “fundus” created serves as a realistic obstacle for the critical visualization of the uterine pedicles, ureters, and anterior/posterior cuff. These are necessary landmarks to identify in the understanding and utilization of a 30-degree scope in gynecologic surgery. Smaller balloons can be added to represent fibroids and adnexal pathology.

Conclusion: Resident training in the utilization of a 30-degree scope is primarily in real-time, in the OR. We present a reusable, modifiable, realistic, and easily reproducible model to aid in the simulation of a subtle, yet critical aspect of gynecologic surgery. Future directions include testing the use of the simulation with residents and observation of in vivo operating skills.

Robotic Assisted Myomectomy: 101

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Study Objective: To provide a video review of basic approach, set up, techniques and method of completing a Robotic Assisted Myomectomy.

Design: Video from robotic assisted myomectomy compiled.

Setting: The operating room set up and procedure was recorded.

Patients or Participants: One patient involved in all video demonstrated.

Interventions: Robotic Assisted Myomectomy.

Measurements and Main Results: Completed Robotic Assisted Myomectomy procedure was recorded.

Conclusion: After reviewing the video presented you will have basic instructions including tips and tricks to performing a robotic assisted myomectomy.
Multiple VS Single Dose Methotrexate Regimens for Cesarean Scar Pregnancy: A Multicenter Study
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Study Objective: To assess the outcome of the treatment of cesarean scar pregnancy (CSP) with single dose methotrexate (MTX-SD) versus multi-dose MTX (MTX-MD) protocols.

Design: A retrospective cohort study from two tertiary medical centers between the years 2011-2019.

Setting: N/A

Patients or Participants: The study cohort included all CSPs cases from the two centers. 32 women in the MTX-SD and 32 women in the MTX-MD groups.

Interventions: MTX-SD, practiced in one medical center, included a single dose of systemic MTX-SD followed by ultrasound guided needle aspiration of the gestational sac in cases with fetal heartbeat. MTX-MD, practiced in the other medical center, included four consecutive doses of MTX, and local KCL in cases with fetal heartbeat. Characteristics and outcomes were compared between both groups.

Measurements and Main Results: Baseline characteristics did not differ between groups. In the MTX-SD group, the median dose number was one, versus three in the MTX-MD group. In 16 (50%) of the cases of the MTX-SD and in 12 (37.5%) of the cases of the MTX-MD, fetal heartbeat was present and US guided aspiration or KCL injection were performed, respectively. There was no significant difference between the MTX-SD and the MTX-MD groups in total days of admission (17±9.3 vs. 17±12.8 days respectively, p=0.94), need for invasive procedures (12.5% vs. 18.7% respectively, p=0.24), readmission rate (31.3% vs. 21.9% respectively, p=0.39) and need of blood products (15.6% vs. 3.1% respectively, p=0.19).

Conclusion: Both MTX-SD and MTX-MD protocols offer high success rate with a relatively low complication rate in the treatment of CSP, with no significant differences between groups.

Can We Predict Same Day Discharge after Minimally Invasive Hysterectomy?
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Study Objective: There has been increasing encouragement for same day discharge after minimally invasive hysterectomy; however, clear predictors of same day discharge have not been established. This study aims to analyze preoperative characteristics and peri-operative outcomes, for patients undergoing minimally invasive hysterectomy, who were discharged on postoperative day zero. We compare them to characteristics of patients discharged home on postoperative day one or more.

Design: Retrospective chart review.

Setting: University-affiliated hospital.

Patients or Participants: Patients undergoing minimally invasive hysterectomy between 2017-2019.

Interventions: N/A

Measurements and Main Results: Two hundred and five patients were included in this study; 23% of patients were discharged on postoperative day zero (SDD group), while 77% were admitted to the hospital. Discharged patients were all under 70 years of age. The median age for the SDD group was 50 vs 55 for the admitted group (p value 0.002). History of abdominal surgery or hypertensive disorder was more common in patients discharged postoperative day one or greater (p 0.004 and 0.003, respectively). Intraoperative and postoperative complications were associated with 100% admission rates (p 0.0084). No difference was found in BMI, EBL, starting hemoglobin, uterus weight and operation duration between the two groups. No difference was found in admission rates regarding diabetes, COPD or smoking status. This analysis found no statistically significant difference in readmission rates, when adjusted for age, with an odds ratio of 2.4 (CI 0.30-20.2).

Conclusion: Hypertension and previous abdominal surgery increase the risk of perioperative complications, which may act as a confounding factor in this study. Age and surgical complications were the only factors found to be independent predictors of admission. Readmission rates were similar. Same day discharge is a safe, practical disposition for majority of patients, and further randomized trials are warranted.

Concomitant Use of Laparoscopic Radiofrequency Ablation with Hysteroscopic Myomectomy for Large, Multi-Fibroid Uterus
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Study Objective: To discuss the combination of minimally invasive myomectomy techniques for large multi-fibroid uteri to ensure resolution of all associated symptoms.

Design: Case Study.

Setting: Suburban hospital, Michigan.

Patients or Participants: 37-year-old Caucasian G2P1011.

Interventions: 1. Hysteroscopic resectoscope of submucosal fibroid (TrueClear) 2. Ultrasound guided laparoscopic radiofrequency ablation (Acessa system) of intramural, subserosal, and broad ligament fibroids

Measurements and Main Results: Patient presented with a longstanding history of a bulky, multi-fibroid uterus. Her symptoms included menorrhagia (resulting in anemia), lower abdominal pain, cramping and back pain. Two prior gynecologists had recommended open hysterectomy given that she had completed childbearing, however she desired uterine conserving surgery. Physical exam revealed a BMI of 24 and a 20-week multi-fibroid uterus. Previous ultrasound noted a multi-fibroid uterus measuring 19 × 14.1 × 8.3 cm and pre-operative MRI demonstrated the largest intramural fibroid to measure 10.9 × 9.1 × 9.2 cm in the posterior lower uterine segment. A pedunculated submucosal (type 0) fibroid was also identified with significant distortion of the endometrial cavity. She elected to proceed with laparoscopic radiofrequency ablation with ultrasound guidance for the type 4-8 fibroids with concurrent mechanical resection of her submucous fibroid. The procedure was performed without complication and the total operative time was less than 2.5 hours. She was discharged from recovery in good condition. At 6-month follow-up, she noted significant reduction in pain, pressure and cramping, with almost complete resolution of menorrhagia.

Conclusion: Uterine sparing concomitant multi-modality surgery can be considered for patients presenting with large fibroids, including those with submucous fibroids as a cause for their symptoms. Laparoscopic radiofrequency ablation combined with hysteroscopic resection, even for fibroids larger than 8 cm, can provide dramatic relief of menorrhagia, bulk and pain symptoms.
Racial Disparities in Hysterectomy Route for Benign Disease: Examining Trends from 2007-2018 Using the NSQIP Database

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*Corresponding author.

Study Objective: To examine national trends among race/ethnicity and route of benign hysterectomy from 2007-2018.

Measurements and Main Results: From 2007 to 2018, 322,834 hysterectomies were collected (216,413 White, 46,248 Black, 60,173 Other; and 33,881 Hispanic). From 2007 to 2018, rates of laparoscopic hysterectomy increased in all cohorts (29% to 71% for White, 23% to 56% for Black, 16% to 60% for Other; and 20% to 64% for Hispanic; p trend<0.01 for all). However, even in 2018 the prevalence of open abdominal hysterectomy for Black Women remains twice as high compared to White women (33% to 15%, p<0.01). Data from the 2014-2018 targeted files showed Black women undergoing benign hysterectomy were younger, had larger uteri, and were more likely to be current smokers, have diabetes and/or hypertension, have higher BMI, and have undergone prior pelvic surgery; but were less likely to have endometriosis, history of severe COPD, and have undergone prior abdominal surgery (p<0.01 for all).

Conclusion: As compared to White women, black women are less likely to undergo benign hysterectomy via a minimally invasive approach. Black women are more likely to have larger uteri and comorbid conditions which may attribute to higher rates of abdominal hysterectomy. Higher prevalence of abdominal hysterectomy among younger Black women highlights potential racial disparities in women’s healthcare.

Evaluation of the American College of Surgeons Surgical Risk Calculator in Hysterectomy

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Study Objective: To evaluate the ability of the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) surgical risk calculator to predict length of stay and perioperative complications in hysterectomy.

Design: A retrospective chart review (Canadian Task Force classification II-1).

Setting: A university hospital.

Patients or Participants: A sample of 283 patients undergoing hysterectomy from 2016-2019.

Interventions: Charts were reviewed, abstracting twenty-one predeterminated preoperative risk factors which were entered into the ACS NSQIP surgical risk calculator. The predicted risk of postoperative complications and length of stay (LOS) were calculated and recorded and compared to actual events. The average predicted risk of each postoperative outcome from the calculator were compared between patients who did, or did not, actually experience that outcome. Wilcoxon tests were used to determine differences in predicted risk between groups.

Measurements and Main Results: Of the 283 patients reviewed, the median age was 48 (interquartile range IQR 18) and the median BMI was 31. 78 of the 283 had malignant findings on final pathology and in this group, the risk calculator did well predicting serious postoperative complication (p=0.04). Conversely, the calculator did a poor job at predicting any postoperative complications in the benign group (p=0.23 for all). The calculator predicted correctly in 41% of cases with the predicted and actual median LOS 1 day (IQR 0.5). Of those whose stay was underestimated (18%), the underestimate was a median of 1 day (IQR 1.75) lower. A total of 35 (12%) patients experienced a post-operative complication, with urinary tract infections (UTI) most common among this population (n=20). The calculator was a good predictor of postoperative death (p<0.01), but failed to detect differences in other post-operative outcomes.

Conclusion: The ACS NSQIP surgical risk calculator does not accurately predict postoperative complications in hysterectomy. Future research should focus on the design of a more accurate surgical risk calculator for patients undergoing hysterectomy.

Most Cesarean Scar Pregnancies Can Be Managed with a Single Dose of Methotrexate

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*Corresponding author.

Study Objective: To investigate the effectiveness of single dose methotrexate (MTX) regimen in cases of cesarean scar pregnancy (CSP).

Design: A retrospective cohort study of all CSPs from a tertiary medical center between the years 2011-2019. Conservative management included treatment with systemic MTX with ultrasound (US) guided needle aspiration of the gestational sac in the presence of fetal heartbeat. We divided the cohort into two groups: women that were treated according to the conservative protocol, and women treated with additional curettage or hysterectomy. Maternal and gestational characteristics were compared between the groups.

Setting: N/A

Patients or Participants: The final study cohort included 32 women diagnosed with CSP and treated according to the conservative protocol.

Interventions: N/A

Measurements and Main Results: 16(47.1%) women underwent additional US guided needle aspiration. Nineteen patients(59.4%) were diagnosed with CSP and treated according to the conservative protocol. Recursive covariates included baseline maternal characteristics, gestational age, and presence of fetal heartbeat. Pearson correlation and Wilcoxon tests were used to determine associations between gestational age and clinical outcomes. The most common outcomes were maternal and fetal complications. The presence of gestational sac hematoma upon admission was identified as a negative predictive factor for successful conservative management (5.3% vs 38.5%,OR [95%CI] 11.2, (1.1-112.5),p=0.02).

Conclusion: Single dose MTX is an effective mode of treatment in cases of CSP. The presence of a gestational sac hematoma on US was identified as a negative predictor for successful conservative treatment of CSP. No other predictive factors were identified.
Robotic Assisted Laparoscopic Tubal Anastomosis:  
Single Institution Analysis  
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*Corresponding author.

Study Objective: To study operative time and cost of robotic assisted laparoscopic tubal anastomosis beyond the learning curve. Secondary objective was to assess pregnancy rate.

Design: Retrospective Cohort Study.

Setting: University-affiliated hospital.

Patients or Participants: All patients who underwent robotic assisted laparoscopic tubal anastomosis from April 2013 to December 2018, performed by a single surgeon at a university-affiliated hospital.

Interventions: Robotic assisted laparoscopic tubal anastomosis surgery.

Measurements and Main Results: 109 patients were identified who underwent robotic tubal reversal. Retrospective analysis of EMR was performed. Phone survey was conducted. Operative times were evaluated for 106 cases. Age ranged from 27 to 46 (median 36 ± 4.7), BMI ranged from 18 to 47 (median 29 ± 5.8). Previous ligations included excisional (63%), cautery (13%), and mechanical obstruction (24%), 60% of patients had previous laparotomy. Mean operative time decreased with experience. In 2013, the average operative time was 140.7 ± 27.0 minutes. Average operative time in 2018 was 60.0 ± 9.1 minutes. Downward trend in operative time was highly significant (p < 0.001). Of note, age, BMI, type of tubal ligation, and previous abdominal surgery did not differ significantly between groups. The average cost of the surgery was $7,153.46 ± $1,484.41. Direct cost was $4798.25.

Follow up information regarding pregnancy outcome was available in 59 patients. Mean follow up time was 37.5 months. 36 patients conceived spontaneously and 23 had not conceived (61%). 75% of patients under 37 became pregnant (n=24), whereas the pregnancy rate was 44% and 45% in the age groups 37-39 (n=7) and >40 years (n=5) respectively.

Conclusion: There is significant improvement in operative time for robotic assisted tubal anastomosis over time. The operative time of robotic assisted tubal anastomosis beyond the learning curve compares favorably, and may even surpass that of the laparoscopic approach, in our experience. Additionally, this is a cost-effective procedure in our institution when compared to laparoscopic approach.

Development of a Low-Fidelity Laparoscopic Hysterectomy Simulation Model  
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*Corresponding author.

Study Objective: To present an inexpensive, easy to assemble, laparoscopic hysterectomy simulation model.

Design: Development of a novel low-fidelity model for use in teaching key steps of laparoscopic hysterectomy.

Setting: Academic medical center.

Patients or Participants: N/A

Interventions: A simulation hysterectomy model was constructed utilizing a silicone foam cover, vessel loops, Penrose drain, and felt to represent the uterus, vasculature, bladder/round ligaments, and fallopian tubes, respectively. The model was affixed to a VCare uterine manipulator and paired with a laparoscopic trainer box. Key steps of a laparoscopic hysterectomy procedure can be demonstrated on the model and surgical trainees can utilize the model for simulation training for laparoscopic hysterectomy.

Measurements and Main Results: N/A

Conclusion: We have developed a novel, low-fidelity laparoscopic hysterectomy model that is easy to assemble and may be utilized by residents to help bridge the gap between the simulated environment and the operating room. The model may be helpful for novice gynecologic surgeons to learn the basic steps of laparoscopic hysterectomy and for senior gynecology residents to gain confidence in their surgical technique and ability to teach junior gynecology residents.

Minimally Invasive Myomectomy: Examining Surgical Route and Racial/Ethnic Trends within a Large Integrated Healthcare System  
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Study Objective: To assess trends in practice pattern and racial and ethnic differences among women who underwent minimally invasive myomectomy (MIM) for benign uterine leiomyomas.

Design: Retrospective observational data-only cohort study.

Setting: A large integrated healthcare delivery organization serving over one million reproductive-aged women annually.

Patients or Participants: Women aged 18 or older who underwent a myomectomy for benign leiomyoma between 2009 and 2019 within Kaiser Permanente Norther California were included. Cases with hysterectomy, pregnancy-related procedures, or malignancy were excluded.

Interventions: N/A

Measurements and Main Results: Between 2009 and 2019, a total of 4040 women underwent a myomectomy for benign uterine leiomyoma with an incidence rate of 0.12 (95% confidence interval [CI] 0.12-0.13) in 2009 to 0.25 (95% CI 0.24-0.25) in 2019 per 1000 women (Table 1). Over the 11-year period, the rate of MIM increased from 6.5% to 89.5% (1280% increase) with an increase in robotic myomectomy from 3.6% in 2012 to 64.6% in 2019. Unadjusted prevalence of MIM increased at a higher rate for non-Hispanic white women than others (Figure 1). Future analyses, adjusting for patient and healthcare system characteristics including fibroid weight and surgeon operating volume, will determine if racial/ethnic variations in myomectomy route persist over time.

Conclusion: Within an integrated healthcare delivery system, initiatives to encourage minimally invasive surgery had a substantial impact on increasing the number of MIM for all women, although white women saw the greatest increase compared to their racial and ethnic counterparts. Further research is needed to identify determinants of racial and ethnic disparities in MIM rates.

Robot-Assisted Nerve-Sparing Eradication of Deep Endometriosis  
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Study Objective: To demonstrate anatomical and technical highlights of a robot-assisted nerve-sparing surgery for deep endometriosis (DE).

Design: Stepwise demonstration of the technique.

Setting: An urban general hospital. Laparoscopic nerve-sparing techniques represented by the Negrar method have been described as resulting in lower rates of postoperative bladder, rectal, and sexual dysfunctions than classical approaches. However, few papers have shown the surgical technique for this procedure using a robotic approach in DE.

Patients or Participants: N/A
Interventions: Robot-assisted nerve-sparing excision of DE was performed using the following 8 steps: Step 1, adhesiolysis and adnexal surgery; Step 2, checking the ureteral course; Step 3, separation of the nerve plane [Step 3-1, dissection of the avascular layer below the hypogastric nerve, between the prehypogastric nerve fascia and presacral fascia]; and Step 3-2, dissection of the avascular layer above the hypogastric nerve, between the prehypogastric nerve fascia and the fascia propria of the rectum]; Step 4, reopening of the pouch of Douglas; Step 5, complete removal of DE lesions while avoiding injury to the nerve plane; Step 6, hysterectomy (if the patient desires non-fertility-sparing surgery); Step 7, checking for rectal injury using an air leakage test; and Step 8, barrier agents for adhesion prevention.

Measurements and Main Results: No patients developed postoperative bladder, rectal, and sexual dysfunctions after the surgery. This nerve-sparing method is a modification of the technique of total mesorectal excision (TME) and total mesometrial resection (TMMR). We considered that this nerve-sparing technique is also applicable to segmental bowel resection and radical hysterectomy.

Conclusion: Robot-assisted nerve-sparing eradication of DE is as technically feasible as the conventional laparoscopic approach. The step-by-step technique should help perform each part of the surgery in a logical sequence, making the procedure easier and safer to complete.

Preliminary Investigation of a Laparoscopic “Muscle Flap Filling Suture Method” for the Treatment of Previous Cesarean Scar Defects

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Study Objective: To investigate the efficacy of hysterectomy combined with a new “muscle flap filling suture method” as a surgical procedure for the treatment of previous cesarean scar defects (PCSDs).

Design: The clinical data (general clinical data, perioperative conditions, and postoperative outcomes) of 11 patients with PCSDs subjected to surgical treatment at the gynecology ward of the Peking University First Hospital from January 2018 to December 2018 were retrospectively analyzed.

Setting: Peking University First Hospital.

Patients or Participants: 11 patients with previous cesarean scar defects.

Interventions: Laparoscopic “muscle flap filling suture method” combined with a hysteroscopic “canal opening method”.

Measurements and Main Results: The average age of the patients was 35.9 ± 2.3 years; the duration of vaginal bleeding was 12.7 ± 4.1 days; the thickness of the lower uterine segment was 2.1 ± 0.4 mm; the average surgical duration was 90 ± 23.4 min; and the intraoperative blood loss was 16.8 ± 11.9 mL. There were no cases of surgical complications. The average menstrual period length at 3 months after surgery was 4.2 days shorter than that before surgery. The thickness of the lower uterine segment was 6.7 ± 1.8 mm. There were 8 cases of cure and 3 cases of improvement, and the efficacy rate was 100%.

Conclusion: PCSD repair with the laparoscopic “muscle flap filling suture method” combined with the hysteroscopic “canal opening method” can preserve uterine integrity and is a safe and effective new procedure.

Shared Decision Making in Opioid Prescribing in Gynecologic Surgery: A Prospective Randomized Controlled Trial

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Study Objective: To determine the impact of shared-decision making in postsurgical opioid prescribing in women who underwent minimally-invasive (MIS) hysterectomy.

Design: Randomized controlled trial.

Setting: Single tertiary care center.

Patients or Participants: Women aged ≥18 years who had a planned MIS hysterectomy.

Interventions: Participants were assigned either to a standard arm (30 tablets) or patient-directed arm (0–30 tablets) of oxycodone 5 mg. Women in the patient-directed arm participated in shared-decision making.

Measurements and Main Results: Seventy-three (36 standard, 37 patient-directed) were enrolled between January 15, 2019–April 4, 2020. There were 5 screen failures after enrollment (3 standard, 2 patient-directed). There were 2 patients lost to follow-up (1 in each arm), and 1 patient in the patient-directed arm who withdrew from the study. 16.9% (11/65) of the procedures were completed laparoscopically, 38.5% (25/65) robotically, and 44.6% (29/65) vaginally. The median number of oxycodone prescribed in the patient-directed arm was 15 (mean 16.8 ± 8.9 tablets). The patient-directed arm utilized a greater percentage of oxycodone (38.4%) than the standard (26.7%, p < 0.001). There was no difference in the total number of oxycodone used for patients in the standard (mean 7.9 ± 9.8 tablets) and patient-directed arms (mean 8.4 ± 10.2 tablets, p = 0.5). The number of oxycodone used for the entire cohort was 8.1 ± 9.9 tablets. 5 patients in the patient-directed arm were prescribed additional narcotics after their preoperative visit versus 0 in the standard arm (p = 0.05). There were no differences in unexpected office or emergency room visits for pain (p = 1.00 and p = 0.49 respectively). There was no difference in patient satisfaction (p = 0.90).

Conclusion: Shared-decision making significantly increased percent of oxycodone utilization but did not decrease the total number of oxycodone used. Patients used on average 20 tablets less than the standard 30 tablets prescribed, and gynecologic surgeons should consider prescribing less opioids after MIS hysterectomy.

Comparison of Self and Resident Assessment of Obstetrics and Gynecology Attendings

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Study Objective: There have been studies assessing OBGYN personality types. However, there is a gap of study assessing attending personality assessment and its effects on residents. The objective of this study is to examine attending self-perception of personality traits, clinical/surgical teaching and provision of feedback and how this compares to resident assessment.

Design: Online Survey.

Setting: Anonymous survey.

Patients or Participants: Current residents and attendings.

Interventions: There were separate attending and resident surveys. The surveys collected demographic information, personality/clinical/surgical teaching assessment as well as a set of slider questions pertaining to resident/attending perceptions. This set was developed with a clinical psychologist. Each survey linked to a validated personality test.

Measurements and Main Results: Resident response rate was 65.8%. Attending response rate was 78.6%. A repeated measure model was used to assess the mean difference in scores between residents and attendings. Attendings viewed themselves as more reliable/trustworthy (p = 0.01), professional (p = 0.04), ethical (p = 0.001), apathetic (p = 0.001) and introverted (p = 0.001)
than residents perceived. Residents viewed attendings as more extroverted (p=0.003), having a higher provision of written evaluation (p=0.02), and better at teaching clinically (p<0.001) and surgically (p=0.05) than they self-perceived. No differences were detected pertaining to attendings as clear communicators, respectful, approachable or provision of verbal evaluation.

McNemar’s test was used to assess the association between subjective and objective measures of attending personality type. 40% of attendings classified themselves as an extrovert but scored as an introvert (p=0.05). There was no difference between classification of type A/B personality types and measurement with the validated personality test.

Conclusion: Attending perception of personality traits, teaching ability, and provision of feedback correlates positively with resident perception for many of the factors studied. For example, residents perceived attendings as better at surgical teaching than they self-perceived. Assessing these correlations may assist in improving resident/attending communication and feedback.

Approach to Difficult Bladder Dissection during Laparoscopic Hysterectomy
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Study Objective: This video describes and demonstrates various techniques for approaching difficult bladder dissection during laparoscopic hysterectomy.

Design: N/A

Setting: The techniques and surgeries demonstrated in this video were performed on patients undergoing laparoscopic hysterectomy in an academic tertiary care center. The patients had surgical histories predisposing them to difficult bladder dissection at the time of laparoscopic hysterectomy. These techniques can be used individually or in combination with each other in order to ensure successful bladder dissection.

Patients or Participants: N/A

Interventions: Four techniques for successful bladder dissection are reviewed in this video. The first technique involves backfilling the bladder with lactated ringers in order to help delineate the boundaries of the bladder and avoid inadvertent injury. A second technique involves first approaching the bladder laterally in order to find a surgical plane for adhesiolysis, followed by further dissection cephalad towards the dome of the bladder. Lateralization of the uterine arteries prior to bladder dissection is described in the third technique. Finally, the last technique involves first creating posterior colpotomy and carrying the incision anteriorly in order to help delineate normal anatomical markers.

Measurements and Main Results: N/A

Conclusion: Total laparoscopic hysterectomy can be safely completed in the presence of dense bladder adhesions through four techniques described above.

Predictors of Post-Operative Emergency Department Visits in Patients Undergoing Minimally Invasive Gynecology Procedures
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Study Objective: To identify pre-operative risk factors for emergency department (ED) utilization in the 18 months following minimally invasive gynecologic surgery.

Design: Retrospective cohort design.

Setting: University hospital health system.

Patients or Participants: All women, 18-45 years old, who had a minimally invasive gynecologic procedure in the University of Pittsburgh Medical Center (UPMC) system in 2016, and health claims data from 2015-2018.

Interventions: A minimally invasive gynecologic procedure in the UPMC system in 2016.

Measurements and Main Results: 1389 women underwent a minimally invasive gynecologic surgery in 2016. The baseline characteristics of patients included age (mean 34.2 years), race (84% Caucasian, 13% African American), type of surgery performed (45% hysterectomy without oophorectomy, 8% hysterectomy with oophorectomy, 47% non-hysterectomy laparoscopic gynecologic procedure) and ED visits in the year prior to the index year (21% patients). ED visits in the 18 months following surgery were used as a measure of healthcare utilization after surgery. A multivariate logistic regression analysis found significant associations between pre-operative patient characteristics and any ED visit in the 18 months following surgery for a diagnosis of pelvic pain aOR 1.57 (95% CI 1.20-2.05, p=0.001), African American race aOR 2.41 (95% CI 1.67-3.44, p<0.001), each ED visit in 2015 aOR 1.68 (95% CI 1.47-1.91, p<0.001), any opioid prescription aOR 1.63 (95% CI 1.22-2.17, p=0.001). A diagnosis of endometriosis aOR 1.02 (0.75-1.38 p=0.92) or depression aOR 1.31 (0.87-1.93 p=0.18) did not have a significant association with ED visits.

Conclusion: Pre-operative patient characteristics, including baseline ED visits and existing opioid prescription, can help predict post-operative healthcare utilization, in this case ED visits. A pre-operative diagnosis consistent with endometriosis was not predictive of post-operative health care utilization. Pre-operative assessment and post-operative follow up for high risk patients may be important ways to decrease post-operative ED utilization.

Single-Port Laparoscopy Versus Conventional Laparoscopy of Benign Adnexal Masses during Pregnancy: A Retrospective Case-Control Study
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Study Objective: This study aimed to compare the operative outcomes of single-port laparoscopy (SPL) with those of conventional laparoscopy (CL) of adnexal masses during pregnancy.

Design: Retrospective case-control study (Canadian Task Force classification II-2).

Setting: Tertiary care academic medical center.

Patients or Participants: The study included all patients who underwent laparoscopic surgery for adnexal masses during pregnancy from October 2010 to January 2020.

Interventions: Among them, 22 patients underwent SPL surgeries and 42 patients underwent CL surgeries.For perioperative outcome evaluation, relative data were collected. The patients were followed up by telephone for cosmetic results, pregnancy and neonatal outcomes.

Measurements and Main Results: No differences in maternal age, parity, multiple gestation, high-risk pregnancy, and history of cesarean section were found between the two groups. Overall cosmetic satisfaction with the scar was significantly favorable in the SPL group compared with the CL group (9.1±1.7 vs 8.1±1.3, p=0.002). While SPL surgeries took significantly longer time than CL surgeries (69.2±21.0 min vs 54.7±20.7 min, p=0.02). Operative blood loss (p=0.948), decrease in estimated hemoglobin level (p=0.779), average length of hospital stay (p=0.657), and hospitalization expenses (p=0.245) were not remarkably different between the two groups. Pregnancy outcomes, neonatal Apgar scores at 1 and 5 min, and average birth weight were also comparable. No incisional hernia was detected in both groups.

Conclusion: SPL provides better cosmetic satisfaction than CL, but does not cause additional perioperative danger, economic burden, adverse
pregnancy, and adverse neonatal outcomes in adnexal surgery during pregnancy. Therefore, for better cosmetic outcomes, SPL could be considered as a feasible and safe surgical option for adnexal masses in pregnant women.

Conservative Treatment for Endometrial Hyperplasia with Atypia and Grade 1 Endometrioid Endometrial Cancer
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Study Objective: to determine the oncologic and reproductive outcomes in women with endometrial hyperplasia with atypia (AH) or stage IA grade 1 endometrioid endometrial cancer (EEC) undergoing medical management with high-dose progesterin therapy in our hospital.

Design: retrospective cohort study. Mean follow-up of patients of 46 months (range 4-156).

Setting: academic hospital, third level of clinical care.

Patients or Participants: 38 patients treated with progesterin therapy, between 2004 and 2018. 31 had AH, and 7 had EEC. Conservative treatment was performed for fertility preservation (71.1% of patients), or due to patient’s surgical risk (18.4%) or patients decision (10.5%).

Interventions: therapies included levonorgestrel intrauterine device (73.6%), megestrol acetate (13.2%), and medroxyprogesterone (13.2%).

Measurements and Main Results: the median age of patients was 41 (29-74). Patients were re-evaluated clinically every 3-6 months, and surveillance transvaginal ultrasound and/or hysteroscopy with endometrial sampling were performed at variable intervals. Complete response was evinced in 33 patients (86.8%). The mean time to remission was 6.7 months (3-18). Recurrence was observed in 4 women (10.5%) after discontinuing treatment to look for pregnancy, 2 of them with an initial diagnosis of AH, and the other 2 with EEC. 3 patients (7.9%) had progression from AH to EEC, and a hysterectomy with salpingo-oophorectomy was performed. Persistence disease was noted in 2 cases (5.3%), both of them with an initial diagnosis of EEC. 25 out of 28 (89.3%) patients treated with a levonorgestrel intrauterine device experienced remission of disease. Among the patients in the fertility preservation group, 23 (85.2%) had remission, of whom 11 looked for pregnancy and 4 got pregnant. Overall survival was not affected.

Conclusion: according to our experience, conservative treatment can be considered for AH and stage IA grade 1 EEC, with close and minimally invasive surveillance

Total Laparoscopic Hysterectomy with Large Fibroid with Ureteral Involvement
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Study Objective: To demonstrate technique for traditional laparoscopic hysterectomy in a uterus with a very large posterior / retroperitoneal fibroid with dense ureteral involvement.

Design: A video presentation demonstrating anatomy and surgical technique.

Setting: A surgery performed in the outpatient setting in Portland, OR.

Patients or Participants: A 50-year-old woman with menorrhagia, pelvic pain, and large fibroids.

Interventions: Total laparoscopic hysterectomy and bilateral salpingectomy were performed. The very large posterior fibroid was densely adherent to the right ureter, requiring recognition of abnormal anatomy and careful ureterolysis in order to safely complete the procedure.

Measurements and Main Results: N/A

Conclusion: Distorted anatomy can complicate surgeries, as we see in this case of a large retroperitoneal fibroid with ureteral involvement. Excellent understand of anatomy and technique is required in order to negotiate such cases. Given correct fundamentals of retroperitoneal surgery, cases with substantially distorted anatomy can be completed safely via minimally invasive techniques, and in fact benefit from the magnification of laparoscopy.

The Laparoscopic Feasibility Index: A New Approach to Formally Classifying the Difficulty of a Robotic Case
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Study Objective: To introduce a new method for formally classifying the difficulty of a robotic case.

Design: Retrospective chart review

Setting: Las Vegas, Nevada

Patients or Participants: Female patients undergoing robotic gynecologic surgery from 2005-2019 by a single gynecologic oncologist (n=1,591).

Interventions: N/A

Measurements and Main Results: A high volume gynecologic oncologist developed an index, the Laparoscopic Feasibility Index (LFI). The index had a score from one to five. A score of 1 meant the robotic case could have been done just as easily using conventional laparoscopy. A score of 5 meant the surgeon would not even attempt the case using conventional laparoscopy due to extreme challenges and a high perceived risk of conversion to open. Scores were assigned at the end of each case. We examined 1,591 robotic cases performed between 2005 and 2019. The distribution of scores were: 1(n=463, 29.1%); 2(n=313, 19.7%); 3(n=345, 21.7%); 4(n=231, 14.5%); 5(n=239, 15.0%). Mean console times were: 0.53hrs (score=1); 0.78hrs (score=2); 0.89hrs (score=3); 1.02hrs (score=4); 1.43hrs (score=5). Use of the 4th arm was: 8.9%(score=1); 26.6%(score=2); 37.4%(score=3); 52.6%(score=4); 89.4% (score=5). Mean EBL was: 30.1cc (score=1); 45.9cc (score=2); 57.1cc (score=3); 81.1cc (score=4); and 94.5cc (score=5). All three of these trends were statistically significant.

We created a regression model to predict the probability that a case had an LFI score of 5 based on EBL, use of 4th arm, and operative time. The 1591 cases were divided into 2 halves using a random number generator. The model was developed on half of the sample and coefficients applied to the other half of the sample (the validation half). The correlation between predicted and observed probabilities in the validation half of the sample was 0.98.

Conclusion: The Laparoscopic Feasibility Index appears to have excellent internal validity based on our analysis of over 1500 robotic cases. This index could potentially be used to monitor a surgeon’s learning curve and how they progress with the complexity of their robotic cases over time.

Successful Laparoscopic Radiofrequency Ablation (Lap RFA) of 10 Cm Adenoma with 2 Year Stability
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Study Objective: To present successful off-label treatment of symptomatic mega Adenoma with Lap RFA for patient desiring to maintain fertility and to present durable 2-year symptom relief and lesion stability post treatment.

Design: Case Report.

Setting: Private Practice TX.
Measurements and Main Results: edge and 5 mm apart. 

Interventions: In July, 2017, after counseling on off label use of Lap RFA for future fertility and off label use on adenaoma, the patient received a concomitant procedure including Laparoscopic Radiofrequency ablation with Acesa system and myomectomy. Lap RFA was used to ablate the large anterior adenoma and myomectomy was performed on several smaller pedunculated fibroids.

Measurements and Main Results: 3 months after the Laparoscopic Radiofrequency Ablation, ultrasound imaging was performed which demonstrated successful shrinkage of the adenoma by 60%. By 6 months, the ultrasound demonstrated 75% reduction in the size of the lesion with sharp margins.

Two years later, the area is stable and the patient is pursuing pregnancy.

Conclusion: For this patient, the off label use of laparoscopic radiofrequency ablation on an adenoma and the off label use for a fertility patient allowed successful treatment of an otherwise untreatable large anterior adenoma involving the entire anterior uterine wall. She is stable 2 years post-op and pursuing fertility.

Impact of a Revised Cuff Closure Technique on the Rate of Vaginal Cuff Dehiscence with Endoscopic Hysterectomy

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Study Objective: To evaluate the outcome of a specific vaginal cuff closure technique at endoscopic hysterectomy to reduce dehiscence.

Design: Retrospective cohort study.

Setting: Academic center, Mayo Clinic Phoenix, Arizona.

Patients or Participants: 434 consecutive patients undergoing endoscopic hysterectomy (363 robotic, 71 laparoscopic) with a revised cuff closure technique.

Interventions: Continuous vaginal cuff closure using delayed absorbable suture (PDS or Vloc) with full thickness bites 5 mm away from the vaginal edge and 5 mm apart.

Measurements and Main Results: The mean age of the cohort was 51.4 years (SD 12.5) with a mean BMI of 30 kg/m² (SD 8.1). Most hysterectomies (73%) were for benign conditions- 94.2% were simple hysterectomies and the remainder, 5.8%, were radical or modified radical. Mean estimated blood loss was 93.4 ml (SD 137.7).

At a median follow up of 518.2 days (SD 673.7) vaginal cuff dehiscence (VCD) was observed in 0.7% of patients, as compared to our previous VCD rate of 4.1% (p = 0.00732) [1] with a previous cuff closure technique using polyglactin absorbable suture. There was a trend of a higher VCD among patients with a lower BMI (22.8 vs. 30.1 kg/m², P= 0.066), and of patients receiving chemotherapy (33.3% vs 3.5%, P = 0.024).

Conclusion: The use of delayed absorbable suture and mass closure technique (5 mm away from the vaginal edge and 5 mm in between sutures) of the vaginal cuff reduced vaginal cuff dehiscence from 4.1% to 0.7%.

Laparoscopic Excision and Re-Attachment of Sacrocolpopexy Mesh

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Study Objective: To describe two cases and demonstrate surgical techniques for recurrent pelvic organ prolapse after minimally invasive sacrocolpopexy.

Design: N/A

Setting: Academic affiliated hospital.

Patients or Participants: Two patients with recurrent pelvic organ prolapse after minimally invasive sacrocolpopexy.

Interventions: A laparoscopic approach was taken for surgical intervention with excision of prior detached vaginal mesh and re-attachment of new sacrocolpopexy mesh to either the sacrum or prior sacral portion of the mesh.

Measurements and Main Results: Two patients presented with recurrent pelvic organ prolapse after failed surgical treatment. The first case is a 68-year-old vaginal multipara with recurrent pelvic organ prolapse status post laparoscopic supracervical hysterectomy, sacrocolpopexy and mid-urethral sling performed at an outside institution. Preoperative physical examination revealed stage 3 prolapse. Mesh was found to be loosely attached to the cervix. After surgical correction, postoperative physical examination revealed stage 1 prolapse. The second case is 62-year-old vaginal multipara with recurrent pelvic organ prolapse status post total laparoscopic hysterectomy and sacrocolpopexy at an outside institution. Preoperative physical examination revealed stage 2 prolapse. The vaginal portion of the mesh was also found to be attached only to the cervix. After surgical correction, postoperative physical examination revealed stage 0 prolapse. Both patients reported improvement in symptoms and overall quality of life.

Conclusion: Surgical management of recurrent pelvic organ prolapse after failed initial sacrocolpopexy procedure can be safely accomplished laparoscopically through identification of points of mesh detachment, anatomical landmarks, removal of the prior vaginal portion of the mesh, and attachment of a new surgical mesh to either the sacrum or sacral portion of the mesh.

Complications Associated with Cesarean Scar Ectopic Pregnancies

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Study Objective: The aim of this study is to present and discuss complications that were encountered during the surgical management of cesarean scar ectopic pregnancies.

Design: This is a video case series of two patients with cesarean scar ectopic pregnancies.

Setting: Both patients were positioned in dorsal lithotomy position prior to the start of the surgeries. A primary surgeon and assistant were placed on either side of the patient.

Patients or Participants: Two patient case series. Patients with a diagnosis of cesarean scar ectopic pregnancy desiring laparoscopic hysterectomy were recruited.

Interventions: Both patients received total laparoscopic hysterectomies for the management of their cesarean scar ectopic pregnancies.

Measurements and Main Results: In both cases significant adhesions were noted leading to complications including uterine artery laceration, bleeding from the cesarean scar ectopic pregnancy implantation site and inadvertent cystotomy. We present in this video dissection techniques used and management of these complications.
Pelvic Endometriosis Causing Hydronephrosis
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Study Objective: Step by step narrated procedure of ureterolysis.
Design: Surgical video.
Setting: The patient was positioned in the dorsal lithotomy position in adjustable Allen stirrups. Three port laparoscopic approach.
Patients or Participants: 51-year-old female who presents with left sided pelvic pain and hydronephrosis/hydroureter.
Interventions: The patient underwent a laparoscopic excision of endometriosis with bilateral ureterolysis.
Measurements and Main Results: Successful removal of endometriosis and resolution of hydrourer and pain.
Conclusion: Laparoscopic excision of endometriosis can be technically challenging and time consuming. A conservative approach with ureterolysis generally resolves the patient’s pain. The imaging of choice in diagnosing ureteral complications of endometriosis is MRI. Cystoscopy post surgery can help assess ureteral function but does not guarantee that thermal injury has not occurred.

Nerve Evaluation during Laparoscopic Endometriosis Resection
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Study Objective: This video demonstrates a targeted nervous system evaluation in the setting of a uterine and ovarian conserving surgery
Design: N/A
Setting: A single surgical center within a large integrated healthcare system.
Patients or Participants: The patient is a 49-year-old perimenopausal woman with dysmenorrhea and a left ovarian cyst who presented for evaluation of new onset left hip and leg pain. The left ovarian cyst was first noted 4 years ago and the patient declined surgery at that time, instead opting for surveillance with repeat imaging which now demonstrated an interval increase in the cyst size. The patient had an extensive evaluation for her leg pain including MRI and nerve conduction studies which were all unremarkable. The patient declined medical management or definitive surgical treatment of the suspected endometriosis. She opted for a diagnostic laparoscopy and left ovarian cystectomy.
Interventions: The patient underwent an uncomplicated diagnostic laparoscopy and left ovarian cystectomy. Given the characteristics of her symptoms, care was taken intra-operatively to examine specific nerves within the lumbosacral plexus.
Measurements and Main Results: No overt pathology was noted along the sacral, genitofemoral, or obturator nerves.
Conclusion: In summary, this video demonstrates steps for performing a targeted evaluation of the pelvic nervous system based on patient’s symptoms.

Laparoscopic Myomectomy with Left Tubal Reanastomosis and Right Neosalpingostomy
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Study Objective: The goal of this video is to demonstrate a variety of options for addressing reversal of tubal ligations, while optimizing the environment to achieve pregnancy with myomectomy.
Design: This is a case report video.
Setting: Academic institution with residents and fellows participating in the surgery.
Patients or Participants: A 34-year-old female with abnormal bleeding due to fibroids, with a history of tubal ligation and desire for future fertility.
Interventions: Robotic assisted myomectomy with left tubal reanastomosis and right tubal neosalpingostomy.
Measurements and Main Results: N/A
Conclusion: This case shows the variety of surgical findings that can be encountered for which a surgeon may have to adapt and demonstrate a diverse surgical skill set. This skill set can then be applied to potentially unforeseen surgical findings in future settings.

A Novel Technique to Minimize Blood Loss in Robotic-Assisted Laparoscopic Myomectomy
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Study Objective: To evaluate the effect and feasibility of using bulldog clamps for temporary occlusion of bilateral uterine and utero-ovarian vessels on blood loss during robotic-assisted laparoscopic myomectomy.
Design: Retrospective chart review.
Setting: Academic tertiary care center.
Patients or Participants: A total of 15 consecutive patients, who underwent robotic-assisted laparoscopic myomectomy using bulldog clamps performed by single minimally invasive gynecologic surgeon, from 2018 to 2020.
Interventions: Patients were taken to the operating room for robotic-assisted laparoscopic myomectomy. Bilateral retroperitoneal dissection was performed with development of avascular spaces and ureterolysis. The uterine artery was skeletonized at its origin bilaterally and bulldog clamp was applied to each side, taking care to avoid ureteral and/or vascular injury. Furthermore, an avascular window was created in the mesosalpinx bilaterally and bulldog clamps were placed, occluding both left and right utero-ovarian vessels. Myomectomy was performed and once completed, all four clamps were removed allowing return of uterine blood flow.
Measurements and Main Results: Mean age and body mass index were 35.2 and 30.9 kg/m², respectively. Most patients were black (53.3%). Mean myoma size and total myoma weight per patient were 6.6 cm and 106 g (standard deviation or SD = 82.7). Most leiomyomas were located in the fundus (41.4%). Mean estimated blood loss was 83 ml (range 20-200 ml). Mean operative time was 186 minutes. There were no intraoperative complications and all patients were discharged home on the same day of surgery.
Conclusion: Temporary bilateral uterine and utero-ovarian vessel occlusion using bulldog clamps can minimize blood loss during robotic-assisted laparoscopic myomectomy. Placement and removal of bulldog clamps for
Office Hysteroscopy for Retained Products of Conception

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Study Objective: Our goal is to present benefits and safety of different techniques in office hysteroscopy for removal of retained products of conception by vaginoscopic approach.

Design: Surgical video.

Setting: MIGs Office.

Patients or Participants: Reproductive age patients presenting with retained products of conception.

Interventions: Office hysteroscopy.

Measurements and Main Results: N/A

Conclusion: Office hysteroscopy is the safe and effective approach for removal of retained products of conception with proper patient selection. If vaginoscopic approach is used, there is less pain and no need for sedation or local anesthetic. Surgeon needs to be familiar with different techniques. It is cost effective and spares the operating room for more complex cases or during the limited resources (such as pandemic).

Challenges in the Diagnosis and Management of Cervical Endometriosis

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Study Objective: To discuss the evaluation and management of cervical endometriosis. To demonstrate a surgical technique for localization and excision

Design: Case presentation and review of literature with narrated video footage.

Setting: A tertiary care hospital and endometriosis referral center.

Patients or Participants: Case Presentation.

Interventions: We present a case of cervical endometriosis, which includes:
- Physical exam findings and tips for diagnosis
- Preoperative imaging
- A surgical technique for intraoperative localization and excision
- Review of literature

Measurements and Main Results: N/A

Conclusion: In summary, cervical endometriosis is important to consider in the patients with abnormal bleeding and chronic pelvic pain. Imaging and consultation with subspecialists may be necessary. There exists no consensus guidelines, but complete excision is imperative when undergoing surgical management.

Innovative Education for the Millennial: Use of Social Media and Multimedia for Impactful Interactive Education of Gynecological Surgery

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Study Objective: Demonstrate the utility of social media in minimally invasive gynecological surgery (MIGS) education and determine the most effective social media platform to impact and interact with the current OB/GYN trainee population.

Design: MIG Tips was created focusing on MIGS education through weekly one minute video posts focusing on surgical technique, anatomy, and technology for all trainees’. Accounts on Instagram (IG), Twitter, and Youtube were simultaneously created and subscriber/follower statistics were tracked.

Setting: Instagram (IG), Twitter, and Youtube social media platforms.

Patients or Participants: Medical Students, OB/GYN Residents, OB/GYN Fellows with access to IG, Twitter, and YouTube.

Interventions: N/A

Measurements and Main Results: IG is the most accessible social media platform to reach, connect, and interact with the current OB/GYN trainee population. Over 90% of IG Migs_Tips followers (https://www.instagram.com/migs_tips/) are OB/GYNs trainees, nationally and internationally. After 1 month, MIGS_Tips IG gained 1,500 OB/GYN trainee followers with over 5,000 video post views. IG Story ephemeral (24 hours) posts gain over 900 view daily, enabling frequent educational interactions with followers.

Conclusion: MIGS_Tips on the IG social media platform is the most impactful for OB/GYN trainees. Over 50 OB/GYN Residency Programs have individual IG accounts, making IG the most accessible social media account to interact with trainees. IG’s ability to share, reply, sticker tap, and follow MIGS_Tips’s multimedia posts greatly increases meaningful interactions and discussions, further facilitating MIGS focused surgical technique, technology, and anatomy education.

Keeping an Eye on the Enemy: Laparoscopic & Robotic Retroperitoneal Entry and Ureterolysis

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Study Objective: Discuss the most common causes of ureteral injury during gynecological surgery. Discuss the avoidance of ureteral injury. Demonstrate, with surgical videography, traditional laparoscopic and robotic assisted laparoscopic retroperitoneal entry and ureteral identification/dissection.

Design: N/A

Setting: 6 minute surgical video reviewing traditional and robotically assisted laparoscopic techniques to identify and dissect the ureter.

Patients or Participants: Education for Medical Students, OB/GYN Residents, OB/GYN Fellows, and Attending Physicians.

Interventions: N/A

Measurements and Main Results: N/A

Conclusion: A keen understanding and knowledge of gynecological and urological anatomy plays an important role in the prevention of urinary tract injury during gynecologic surgery. The primary approach to prevention of ureteral injury is careful surgical dissection and knowledge of the position of the urinary tract structures within the surgical field.

Preoperative Predictive Score of Ovarian Torsion in Pregnancy

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Study Objective: To develop a risk score calculator for the prediction of adnexal torsion during pregnancy.

Setting: Tertiary medical center.

Patients or Participants: All women who underwent surgical diagnostic procedure due to suspected adnexal torsion in pregnancy. Overall, 156 women were included.

Interventions: Operative laparoscopy.

Measurements and Main Results: We collected demographic and clinical characteristics. The presence or absence of adnexal torsion during the surgical procedure was recorded. Adnexal torsion was identified in 131 (83.9%) of the surgical procedures. The rate of previous ovarian torsion was lower in the torsion group [OR (95%CI) 0.41 (0.17-0.97), p=0.04], while duration of symptoms <8 hours was higher [OR (95%CI) 7.31 (1.65-32.43), p=0.002], as was pain score (0-10) [mean 8.5 vs. 7.2, p=0.007].

On physical examination, women appeared in more pain in the torsion group, had more peritoneal irritation, and less left adnexal tenderness [OR (95%CI) 4.34 (1.74-10.58), p=0.001; 4.59 (1.67-23.23), p=0.02; 0.27 (0.11-0.66), p=0.003, respectively]. In blood analysis, white blood cells concentration was higher in the torsion group (11.3 vs. 9.9 K/microL, p=0.01), as was the neutrophils to lymphocytes ratio (3.4 vs. 2.5, p=0.01) and the maximal diameter of the affected ovary (70 vs. 55 mm, p=0.02).

After multivariate analysis, three risk factors remained significantly independently associated with ovarian torsion: previous ovarian torsion was negatively associated [aOR (95%CI) 0.24 (0.04-0.80), p=0.03], while ART and women that appeared in pain were positively associated [aOR (95%CI) 9.8 (2.22-43.6), p=0.003; 3.8 (1.23-12.18), p=0.02, respectively].

Calculated risk for adnexal torsion was 0%, 68.2%, 90.4% and 100% in the presence of 0, 1, 2 and 3 risk factors respectively.

Conclusion: Our risk score calculator may assist clinicians in the prediction of adnexal torsion during pregnancy.

Robotic Single-Site Resection of Ureteral Endometriosis with Additional Ports

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Study Objective: To demonstrate the feasibility and advantages in applying the robotic system with additional ports to single-site laparoscopic resection of ureteral endometriosis.

Design: Video presentation of surgical techniques.

Setting: University hospital.

Patients or Participants: Three patients with endometriosis obstructing the ureter(s).

Interventions: A bipolar grasper, wristed needle drivers, and scissors with monopolar energy were used. Additional ports were inserted due to the complexity of the operation. Entry was made at the umbilicus and carried down into the abdominal cavity, and the pelvis was inspected for endometriosis lesions. The first patient was a 38-year-old G0P0 with an absent right kidney and ureter from a congenital Mullerian fusion defect who complained of one-year duration of pelvic pain. Superficial endometriosis nodules were identified on the left ureter. The lesions were trimmed with cold scissors to avoid thermal damage. The second patient was a 44-year-old G1P1001 who presented with left kidney failure following a longstanding history of chronic pelvic pain and endometriosis with urinary symptoms. Multiple gynecologic procedures were required, including resection of bilateral deep-infiltrating endometriosis lesions, total laparoscopic hysterectomy with bilateral salpingo-oophorectomy, and lysis of adhesions. Structured segments of the left ureter were excised and then left ureteroneocystostomy was carried out. The third patient was a 33-year-old G0P0 with recurrent Stage IV endometriosis who had bilateral ureteral strictures. Bilateral robotic laparoscopic ureterolysis and ureteroneocystostomy were indicated. Notably, for the anastomosis, the bladder was sufficiently mobilized and a Psoas hitch was performed on the right to ensure no tension at the repair site.

Conclusion: Robotic-assisted single-site laparoscopy with additional ports is an effective method for ureteral endometriosis removal. A combined effort between gynecology and urology may be needed for highly advanced cases.

Robotic Assisted Transvaginal Notes Hysterectomy

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Study Objective: To demonstrate a novel approach to transvaginal natural orifice transluminal endoscopic surgery (vNOTES) hysterectomy with bilateral salpingectomy using robotic assistance

Design: Video presentation of the surgical procedure.

Setting: University hospital.

Patients or Participants: A 34-year-old G2P1011 with one prior cesarean section and myomectomy complained of dysmenorrhea and chronic pelvic pain and requested for the most minimally invasive form of hysterectomy.

Interventions: A robotic-assisted transvaginal hysterectomy with bilateral salpingectomy was performed. The surgery began as a conventional transvaginal hysterectomy. An anterior and posterior colpotomy were performed, as which point, a camera was inserted to improve visibility. This allowed for confirmation of suspected adhesions from the patient’s surgical history, most notably present in the anterior cul-de-sac between the bladder and uterus. Wristed instruments of the robot, the monopolar scissors and bipolar grasper, were also placed which enabled better navigation in the narrow surgical space. The remainder of the surgery, including the lysis of the dense adhesions, was completed smoothly with robotic assistance. The vaginal cuff was closed with a continuous running s-v.loc. The pelvis was inspected upon conclusion of the procedure and hemostasis was observed throughout.

Measurements and Main Results: The surgery was completed in 90 mins without complications. The patient was discharged on the same day. On follow-up, the patient noted that her post-operative pain was significantly less than what she had experienced after her previous myomectomy.

Conclusion: We showed that robotic-assisted NOTES is a novel and feasible option for transvaginal hysterectomy in indicated patients, particularly those with abnormal pathologies such as dense adhesions. In addition to image-guidance, robotic surgery allows for full articulation of instruments required for this surgery, which improves ease and access over other methods like laparoscopic surgery.

The Impact of the COVID-19 Pandemic on Obstetric and Gynecologic Procedures and Consults at a Metropolitan Hospital in the Epicenter

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Study Objective: The purpose of this study was to assess the impact of the COVID-19 pandemic on surgical volume and emergency department (ED) consults across obstetric & gynecologic (OB/GYN) services at a hospital located in the national epicenter of the pandemic.

Design: Retrospective cohort study.

Setting: Tertiary-care academic medical center in a metropolitan city.

Patients or Participants: Women undergoing OB/GYN ED consults or surgical procedures.

Interventions: March 16th institutional COVID-19 mandate to hold all elective surgeries.

Measurements and Main Results: The volume and types of surgical cases and ED consults were compared before and after the COVID-19 mandate. During the pandemic, the volume of ED consults and GYN surgeries significantly decreased, while OB surgeries remained stable. The average weekly case volume for ED consults, GYN surgeries, and OB surgeries were 44.8, 34.8, and 38.6 cases respectively during the “pre-COVID” timeframe (February 1st to March 15th) versus 17.8, 7.2, and 40.9 cases respectively during the “post-COVID” timeframe (March 16th to April 15th), representing a 60.3% decrease in ED consults (p<0.01) and a 79.3% decrease in GYN surgical volume (p<0.01). The distribution of GYN surgical case types also changed significantly during the pandemic with higher proportions of emergent surgeries for ectopics, miscarriages, and concern for cancer (p<0.001). Alternatively, the OB surgical volume and distribution of OB surgical case types remained relatively constant.

Conclusion: This study highlights how the pandemic has impacted the ways OB/GYN patients access and receive care. The OB surgeries remained stable during the COVID-19 pandemic reflecting the non-elective and time-sensitive nature of obstetric care. In contrast, ED consults and GYN surgeries decreased significantly. As expected, institutional policies suspending elective surgeries affected the volume and types of GYN surgeries performed during the pandemic, and the “stay-at-home” policy and personal fears of COVID-19 infection likely affected ED consult volumes.

Endometriosis on the Internet – Myths or Facts?
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Study Objective: To determine the extent of misinformation of endometriosis portrayed online by assessing accuracy and completeness of common websites.

Design: An online search identified the top 20 websites for 4 search engines. Videos and duplicates were excluded. An 82-item questionnaire with categories for characteristics, diagnosis and treatment assessed accuracy and completeness each for a score out of 15.

Setting: N/A

Patients or Participants: Online review (n=34 websites)

Interventions: N/A

Measurements and Main Results: Most websites were news-related (44.1%) and healthcare (26.5%). Websites with affiliations had significantly higher accuracy (15, IQR 0) than those without (12, IQR 4.0) (p=0.001). Healthcare/advocacy websites had significantly higher accuracy (15, IQR 1.25) than other types (13, IQR 4.5) (p=0.034). Those with references had significantly higher completeness (8, IQR 3.0) than those without (4, IQR 2.0). Non-news-related websites had significantly higher accuracy (14, IQR 3.0 vs. 12, IQR 4.0) (p=0.025) and completeness (7, IQR 3.0 vs. 4, IQR 5.0) (p=0.009) than news-related websites. A higher % of complex words (20.0%, IQR 5.71) had significantly higher completeness (p=0.014). A higher Flesch Reading Ease Score (FRES) (45.8, IQR 17.5) trended towards higher completeness (p=0.086).

Reported symptoms included dysmenorrhea (97.1%), infertility (88.2%) and dyspareunia (82.4%). Cancer was mentioned in 41.1% of websites. Diagnostic laparoscopy was most commonly reported (91.0%) than ultrasound (88.3%). Common therapeutics included the oral contraceptive pill (79.4%), laparoscopy (70.6%), NSAIDs (67.6%), and GnRH agonists (64.7%). Hysterectomy (59.0%) was mentioned more than prostegins (53.0%). Overall, 18/34 (53%) of websites contained inaccurate/misleading statements.

Conclusion: Certain website characteristics may indicate higher accuracy or completeness such as website type or references/affiliations. Most websites accurately reported symptoms, however misconceptions included a dramatized cancer risk, lack of use of ultrasound for diagnosis, and a false need for diagnostic laparoscopy before treatment. Laparoscopy was mentioned more than common first-line medications. Most websites contained inaccurate/misleading statements which highlights the importance of directing patients to evidence-based resources.

Characteristics of Suspected Endometriosis without Histologic Confirmation
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Study Objective: We aim to describe the clinical and laparoscopic features of suspected endometriosis lacking histologic confirmation.

Design: Retrospective cohort study.

Setting: Quaternary community medical center.

Patients or Participants: All consecutive pathology reports from patients who underwent surgery for clinically suspected endometriosis by three surgeons from the Division of Minimally Invasive Gynecologic Surgery between 01/01/2016 and 12/31/2019 were reviewed and categorized in two groups: endometriosis histologically confirmed, and endometriosis not histologically confirmed. A retrospective analysis of the patients without confirmed endometriosis was performed by evaluating clinical, surgical, and histologic characteristics.

Interventions: Laparoscopic surgery.

Measurements and Main Results: Of 487 patients, endometriosis was histologically confirmed in 419 (86.0%) and not confirmed in 68 (14.0%). Study group age range was 16 to 48 (median 30.5). Patients clinically presented with a variety of symptoms suspicious for endometriosis. 23 (33.8%) of the 68 patients without confirmed endometriosis had other gynecologic abnormalities, including leiomyomata, endometrial polyps or adenomyosis. 39 cases (57.3%) without confirmed endometriosis had non-specific histopathologic findings such chronic inflammation, fibrosis, adhesions, reactive changes, and hemosiderin deposits, while the remaining 29 (42.6%) had no histologic abnormalities. On laparoscopic evaluation, lesions appeared heterogeneous and suspicion of endometriosis was high in 10 (15%), low in 36 (53%), and absent in 22 (32%) patients. Laparoscopically, there were 14 cases without any abnormality visualized in the group with no histologic abnormalities (48%) compared to only 5 cases in the group with histologic findings (13%).

Conclusion: Despite the absence of histologically confirmed endometriosis, patients with clinically suspected disease still experience significant symptoms and management decisions remain challenging for both patients

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and clinicians. Over half of the patients without confirmed endometriosis had non-specific histopathologic findings. Further research should analyze how these findings correlate to the clinical symptoms of patients with suspected endometriosis and role in management in such patients.

Readability, Quality & Adherence of Online Education Material for the Medical, Surgical & Interventional Radiology Options for Leiomyoma

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Study Objective: To assess the readability, quality, and adherence of online patient education materials (PEMs) for leiomyoma treatment.

Design: Cross-sectional analysis was performed. Search queries included keywords targeting medical and surgical treatments, including minimally invasive and laparotomy approaches. The top 20 websites per search query were retrieved from “Google” and evaluated for readability using the “Flesch Reading Ease Score” (FRES), “Flesch Kincaid Grade Level” (FKGL) and “Gunning Fog Index” (GFI) formulas. Quality was ascertained using the DISCERN instrument, Journal of the American Medical Association (JAMA) benchmarks, and Health on the Net Foundation Code of Conduct (HONcode) certification by three reviewers. “Adherence” to Society of Obstetricians and Gynecologists of Canada (SOGC) guidelines was assessed using a 5-point Likert scale by two reviewers.

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: Of the 151 websites evaluated, 84 (55.6%), 49 (32.4%), 18 (11.9%) involved medical, surgical and interventional radiology modalities, respectively. The mean FRES, FKGL and GFI scores were 43.58 (95% CI 40.7, 45.40), 11.78 (95% CI 11.30, 12.20), and 14.39 (95% CI 13.90, 14.90), respectively. The mean DISCERN, JAMA, and adherence scores were 57%, 34%, and 59%, respectively. 39 (25.8%) of PEMs were HONcode accredited. 53 (35%) of PEMs were rated as either “good” or “excellent” by DISCERN. Majority of PEMs (79%) were not adherent to SOGC guidelines. Similarly, the majority of PEMs had JAMA scores <2 (63%).

Conclusion: Online PEMs for leiomyoma treatment do not meet national reading recommendations, and may be difficult for patients to comprehend. Furthermore, the majority of PEMs do not meet minimum quality standards, potentially contributing to poor health literacy and adverse clinical outcomes.

Correction of the Vault Prolapse Vaginally through Apical Sling with Fixation in the Sacrosaphin Ligament with a New Device

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Study Objective: Evaluate the efficacy and safety of the technique for correction of the vaginal vault prolapse through the use of Apical Sling with fixation in sacrosaphin ligament (AS-FSL) using a new device (SPLENTIS).

Design: We did a retrospective cohort and the range of follow-up was 6-42 months.

Setting: Patient at lithotomy position and asseptic procedures performed as usual for vaginal surgery.

Patients or Participants: In the national health system, our center is positioned as a reference for surgical gynecological cases receiving patients referred from basic health units on a random basis. We included the patients that we received in the period (2016-2019) that needed vault prolapse correction. A total of 20 patients were included at the study.

Interventions: Was performed the dissection of the vault prolapse and paravaginal spaces until the sacrosaphin ligament. With the rod of the AS-FSL, the harpoons are fixed 0.5 cm from the ischial spine. Through the harpoon wires, a specific sling for vault prolapse was placed and the mucosa was closed with simple suture.

Measurements and Main Results: There was only one case of relapse, and with the exception of this case, all patients assessed would indicate surgery to a friend (95%) with the average satisfaction via Likert Scale of 9.25. There were no tape extrusions (100%) or complications requiring readmission (100%). Cure of 45% of the cases of urinary incontinence associated, only one case reporting sexual life worsening, only one case of defect appearance during Valsalva maneuver, total vaginal length of > 6cm at 50% of the cases.

Conclusion: It has been demonstrated, within the limitations of the small number of patients and single treatment center, that surgical repair of the vault prolapse can be performed vaginally through the AS-FSL safely with satisfactory objective and subjective results and reduced length of stay.

Prevalence of Adenomyosis Among Symptomatic Young Adults in Association with Patient-Reported Outcomes: A Pilot Study

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Study Objective: To estimate the prevalence of adenomyosis among young adult patients with dysmenorrhea and/or heavy menstrual bleeding based on transvaginal ultrasounds (TVUS) and to assess various patient-reported outcome measures.

Design: Prospective cohort study. This abstract is an interim analysis of a larger ongoing study.

Setting: Outpatient minimally invasive gynecologic surgery (MIGS) clinic.

Patients or Participants: Patients ages of 18 to 27 presenting with dysmenorrhea and/or heavy menstrual bleeding (n=15).

Interventions: TVUS to evaluate menstrual complaints and study questionnaires including self-reported health and demographic information, as well as validated patient-reported outcome measures (PROMs) from the Menstrual Bleeding Questionnaire (MBQ), Endometriosis Health Profile-30, and the EQ-5D-3L to evaluate menstrual symptoms, health status, and impact on quality of life.

Measurements and Main Results: Data from 15 patients have been analyzed thus far. TVUS reports were assessed for markers associated with adenomyosis and based on the presence of these markers, were given a TVUS diagnosis of adenomyosis. The prevalence of TVUS-diagnosed adenomyosis among the sample was 33.3%. The most common ultrasound markers were a heterogenous myometrium (60.0%) and asymmetrical thickening (26.7%). Patients with TVUS-diagnoses of adenomyosis had higher EHP-30 pain scores (59.1±28.3 vs. 42.1±20.2; p=0.249), HEP-30 emotional well-being scores (43.8±30.9 vs. 26.7±17.4; p=0.205), and higher EHP-30 composite scores, which includes impact on quality of life (53.1±29.8 vs. 36.9±20.2; p=0.258) than patients without TVUS-diagnoses of adenomyosis. Patients with TVUS-diagnoses of adenomyosis had similar MBQ scores as patients without the TVUS diagnoses (18±9.8 vs. 23.1±10.7; p=0.938).

Conclusion: Findings of this pilot study support a higher prevalence of adenomyosis among young adults than has been reported in previous literature. Patients with TVUS-diagnosed adenomyosis trended towards worse dysmenorrhea, physical and mental health statuses and overall quality of life. Current research gaps in adenomyosis among this age group necessitate further research, especially as we learn more about true prevalence rates.
Optimizing Bag Selection: An Overview of Laparoscopic Specimen Retrieval Bags

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Study Objective: The objective of this video is to provide an overview of the variety of different specimen retrieval bags available in the United States, offer practice guidelines for bag selection, and review bag terminology to highlight important concepts for bag selection.

Design: Although a number of companies manufacture laparoscopic bags to assist in removal of specimens from the body cavity, differences in size, shape, and labeling of the bags lead to confusion when attempting to choose the best laparoscopic bag for one’s needs.

Setting: Laparoscopic Surgery Requiring Specimen Removal.

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: To assist viewers, we include a review table comparing various specifications of the most common laparoscopic bags in the United States. We talk viewers through steps on how to choose a bag during laparoscopic surgery. These steps include first determining the specimen size, type, and shape. These specimen characteristics will dictate the required bag size and type of bag, and which ultimately will influence laparoscopic trocar size. Finally, we demonstrate the bagging of various tissue specimens with different sizes and shapes of laparoscopic bags.

Conclusion: To maximize operating room efficiency, we recommend starting off by thinking about the characteristics of the pathology, which will dictate bag size and bag type, which finally will influence trocar size. Starting off with an appropriate laparoscopic bag will reduce operating room efficiency and allow for safe laparoscopic removal of specimens from the body cavity.

The Association between Testosterone Therapy and Postoperative Complications Among Transmen

Undergoing Gender Affirming Hysterectomy

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Study Objective: While there is increasing evidence on the safety of testosterone for transmen, little is known regarding its perioperative implications. This study seeks to investigate the association between testosterone and postoperative complications among transmen undergoing gender affirming hysterectomy.

Design: Retrospective cohort study of all gender affirming hysterectomies performed at a single teaching hospital in the United States over 26 months, with 6 weeks follow up to identify postoperative complications. This study seeks to investigate the association between testosterone and postoperative complications among transmen undergoing gender affirming hysterectomy.

Setting: Standard laparoscopic operating room setup with patients in dorsal lithotomy.

Patients or Participants: 34 transmen on testosterone for at least 12 months before hysterectomy and continued at time of surgery.

Interventions: All patients underwent a total laparoscopic hysterectomy with bilateral salpingectomy.

Measurements and Main Results: Data was collected through chart review of preoperative visits for covariates and testosterone dose and postoperative visits for complications. There were 8 postoperative complications including 6 transmen who experienced vaginal bleeding requiring application of hemostasis agents to the vaginal cuff. Mean weekly testosterone dose was 69.3mg among transmen who experienced a complication and 62.5mg among those who did not. Both groups had similar mean age (31.8 vs. 29.2), mean BMI (29.8 vs. 26.9), race (87.5% vs. 57.7% White, 12.5% vs. 26.9% Black), smoking status (12.5% vs. 19.2% current smokers), and estimated blood loss (55.7ml vs. 62.9ml). Univariable and multivariable logistic regressions were performed, adjusting for race, age, BMI, and estimated blood loss. The odds of experiencing a postoperative complication was 3% higher for every additional milligram of testosterone (OR 1.03, 95%CI 0.98-1.08).

Conclusion: Transmen on testosterone experience vaginal bleeding post-hysterectomy at a higher rate than reported in the literature for cis-women. While testosterone de-estrogenizes the vaginal epithelium, testosterone dose is not statistically significantly associated with postoperative complications including vaginal bleeding. Additional studies with larger samples and studies evaluating the effect of postoperative vaginal estrogen on bleeding among transmen are needed to better characterize this postoperative complication.
Techniques of Laparoscopic Single Site Left Giant Ovarian Cystectomy Utilizing Traditional Instruments
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Study Objective: Single-site laparoscopy surgery is the most minimally invasive surgery for a gynecologic procedure, but traditional laparoscopy surgery has the limitation of lack of exposure and limited surgical space when using traditional surgical instrumentation, such as in a giant ovary cyst. Trans-umbilical natural orifice transluminal endoscopic surgery (NOTES) offers similar benefits of traditional laparoscopy surgery but also expands the horizon of traditional laparoscopy surgery by allowing the surgeon to perform procedures that are typically limited to an abdominal approach. The advantages of NOTES may include no incisional pain as well as a better cosmetic outcome. These benefits help outweigh the obstacle of learning this novel approach. Our objective is to demonstrate the trans-umbilical NOTES technique as a combination of traditional laparoscopic surgical skill with single-site surgical skill.

Design: Stepwise demonstration of the trans-umbilical NOTES technique for giant ovarian cystectomy with narrated video footage.

Setting: Academic tertiary care hospital.

Patients or Participants: A 27-year-old woman.

Interventions: Trans-umbilical NOTES giant ovarian cystectomy with combined abdominal surgical and single-site surgical skills.

Measurements and Main Results: A 27-year-old woman (gravida 1 para 1) with pelvic MRI: giant cyst of left ovary, size 145.6 * 83.1 * 170.1 mm, no papillary structure requested ovary cyst removal with ovary preservation. She presented with a 1-year history of left pelvic pain. The giant ovary cyst was removed with minimal blood loss, and pathology revealed a ovarian teratoma. The patient had resolution of her left-sided pelvic pain.

Conclusion: Combined with traditional abdominal surgical skill, single-site surgical skills allow the surgeon to access the entire abdomen and perform ovarian cystectomy through a trans-umbilical single port. Trans-umbilical NOTES giant ovary cystectomy is not only possible but allows ovary cystectomy to be performed with minimal abdominal incision.

Incidence and Risk Factors for Intrauterine Adhesions Following Myomectomy
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Study Objective: To determine the incidence & risk factors for intrauterine adhesions (IUA) following myomectomy.

Design: Retrospective cohort.

Setting: Academic practice.

Patients or Participants: 158 women undergoing robotic (RM), laparoscopic (LM), abdominal (AM) or hysteroscopic (HM) myomectomy between 2007-2017 with post-procedure hysteroscopy within 12 months of surgery. Women with a history of IUA were excluded.

Interventions: IUAs were ranked by two authors as minimal, moderate, or severe.

Measurements and Main Results: The most common indications for myomectomy were infertility (57%) abnormal uterine bleeding (39%), and pain/bulk symptoms (27.8%). The overall incidence of IUA was 10.1% (n=16), 75% of which were categorized as “minimal” and 25% as “moderate”. The incidence of IUA was highest for LM (14.3%), followed by HM (12.0%), AM (9.1%), and RM (8.8%). Women with a history of prior uterine surgery had more IUAs identified (12.5 vs 9.3%). Women with 1 fibroid removed had a similar incidence of IUA as those with 2-4 removed (8.7 vs 8.9%). Those with ≥ 5 fibroids had the highest incidence of IUA (11.9%). Women with at least 1 submucosal fibroid had an incidence of IUA of 14.6%. Those with at least 1 intramural fibroid had an incidence of 11.7%. Fibroids requiring ≥ 4 layers of closure had an IUA incidence of 14.6% compared to requiring <3 layers (5.8%). There was no difference in IUA incidence when using barbed vs non-barbed suture to close the deepest fibroid layer (10.3 vs 9.6%). Cavity entry was associated with an increase in incidence of IUA (14.6 vs 7.2%). A concurrent diagnosis of adenomyosis was associated with an increase in incidence of IUA (25 vs 9.7%).

Conclusion: IUAs can occur without intraoperative breech of the uterine cavity. Adenomyosis, 4-layer closure, ≥ 5 fibroids, and history of prior uterine surgery may increase risk for intrauterine adhesion formation, but larger studies are needed to definitively determine risk.

A Method of Improving Representation of Endometriosis Ultrasound Data By Using Local Phase Tissue Signatures
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Study Objective: Endometriosis is a gynecological condition affecting 10-15% of women in their reproductive years. Early and accurate diagnosis requires the development of noninvasive, cost effective and safe imaging technology. Ultrasound could overcome some of the MRI challenges. However, noise, high inter- and intra-variability during ultrasound imaging reduces image quality and reproducible reading. Deep learning has increased its role in imaging analysis and has been applied to automatic ultrasound image analysis. The main objective is the investigation of how new computational methods, can improve the representation of endometriosis tissue in ultrasound data.

Design: We have developed computational method for processing B-mode ultrasound data. Our algorithms are based on the extraction of local phase tissue signatures, are intensity invariant. These features are not affected by the ultrasound transducer operating frequency, ultrasound machine settings, and the body mass index of the patient.

Setting: Clinical ultrasound sites.

Patients or Participants: The proposed computational methods will be validated on 3D ultrasound images obtained from the standard transvaginal ultrasound examinations.

Interventions: Both RF signals and B-mode data will be normalized to [-1, 1] and then rescaled to size (4096, 256, number of slices) using bilinear interpolation before inputting to our proposed networks. Training of the proposed CNNs will be achieved by investigating various methods based on gradient descent and variants such as adam, adagrad, adelta.

Measurements and Main Results: 100 B-mode US and RF US scans will be collected from each patient bringing the dataset size to 27,400 (B-mode and RF US). A sample size of 274 (137 healthy,137 diseased) subjects is sufficient to estimate a high Area Under the Curve.

Conclusion: New tissue signatures provide valuable information and improved representation of the endometriosis. Future work will involve the development of artificial intelligence, specifically methods based on deep learning, methods to derive models that yield individual-level accurate, early diagnosis in the context of endometriosis management.

Quality of Life in Women with Heavy Menstrual Bleeding Associated with Uterine Fibroids: Baseline Disease Burden from Elaris UF-1 and UF-2
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**Study Objective:** Report baseline Uterine Fibroid Symptoms Quality of Life Questionnaire (UFS-QoL) data from Elaris UF-1 and UF-2 to characterize disease burden from heavy menstrual bleeding (HMB) associated with uterine fibroids (UF).

**Design:** Elaris UF-1 (NCT02654054) and UF-2 (NCT02691494) were identical, phase 3, double-blind, randomized, placebo-controlled studies investigating safety and efficacy of elagolix alone or combined with hormonal add-back therapy for HMB associated with UF.

**Setting:** Outpatient in clinic/office.

**Patients or Participants:** Premenopausal women (n=790) aged 18–51 years with diagnosed UF and HMB (menstrual blood loss [MBL] >80 mL/cycle for ≥2 menses).

**Interventions:** N/A

**Measurements and Main Results:** A modified UFS-QoL (4-week recall) was conducted before study drug administration. UFS-QoL is a self-administered, 37-item, disease-specific questionnaire that measures symptom severity and health-related QoL (HRQoL; calculated from 6 subscales and scored 0–100). Lower HRQoL scores indicate worse QoL. At baseline, mean (standard deviation [SD]) age was 42.4 (5.4) years, and MBL was 239.7 (158.7) mL. Baseline total HRQoL score was low, reflecting low QoL. Mean (SD) scores were generally low across HRQoL domains (concern, 28.1 [24.6]; activities, 40.9 [27.0]; energy/mood, 47.4 [25.3]; control, 54.2 [28.3]; self-consciousness, 39.9 [30.7]; sexual function, 47.5 [35.4]). In each HRQoL domain, the questions most frequently answered ‘most’ or ‘all’ of the time were how often symptoms made patients: feel concerned about soiling underclothes (80%; concern), decrease the amount of time on exercise or other physical activities (59%; activities), feel tired or worn out (68%; energy/mood), feel less productive (50%; control), feel conscious about the size and appearance of their stomach (57%; self-consciousness), and avoid sexual relations (46%; sexual function).

**Conclusion:** There was considerable baseline disease burden. Patients reported the greatest impacts to concern and self-consciousness. Common issues included concerns about soiling underclothes (80%; concern), decrease the amount of time on exercise or other physical activities (59%; activities), feeling tired or worn out (68%; energy/mood), feel less productive (50%; control), feel conscious about the size and appearance of their stomach (57%; self-consciousness), and avoid sexual relations (46%; sexual function).

**Transcervical Fibroid Ablation (TFA) in an Ambulatory Surgical Center Setting: Utility during the COVID-19 Pandemic**

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**Study Objective:** To describe the experience of TFA with the Sonata system in the ambulatory surgicenter (ASC) setting, relative to current recommendations by medical societies for elective procedures during the COVID-19 pandemic.

**Design:** Prospective, longitudinal, multicenter controlled trial.

**Setting:** 22 clinical sites in the US and Mexico.

**Patients or Participants:** 147 premenopausal women between the ages of 25 and 50 with heavy menstrual bleeding secondary to nonpedunculated fibroids.

**Interventions:** Transcervical, intrauterine ultrasound-guided radiofrequency ablation with the Sonata system. Pain scores were recorded after each procedure using a scale from 0–10. Length of stay (LOS) was measured from procedure start through discharge.

**Measurements and Main Results:** Of 147 treated patients, 49 were treated in an ASC setting and 98 were treated in other outpatient settings. Fifty-five percent of patients treated in an ASC had general anesthesia and 45% had conscious sedation vs 48% and 52%, respectively, for non-ASC population. Average number of fibroids treated per patient was 3.2±2.0 and 2.9±2.1 in ASC and non-ASC, respectively. Mean LOS was 2.1±0.9 hours vs. 2.8±1.3 hours for ASC and non-ASC patients, respectively. Mean procedure pain scores were 0±0% for the ASC patients (0.4±1.1 for non-ASC patients). Mean return to normal activity for patients treated in ASC was 1.7±1.4 days (2.4±2.5 for non-ASC patients). Mean 12-month improvements in SSS and HRQL scores were -34.8±23.9 and 48.6±26.2 points, respectively, in ASC patients (-30.4±19.3 and 41.0±23.0, respectively, in non-ASC patients).

**Conclusion:** Current surgical guidance during the COVID-19 pandemic encourages avoidance of endotracheal intubation when appropriate and minimizing exposure time for patients and staff. Transcervical Fibroid Ablation with the Sonata system is performed without pneumoperitoneum or a requirement for intubation, providing short LOS, minimal pain scores and improved outcomes while potentially reducing risk to healthcare personnel and patients alike.

**Telemedicine for Delivery of Postoperative Care Following Minimally-Invasive Gynecologic Surgery: A Randomized Controlled Trial**

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**Study Objective:** Determine if patient satisfaction is greater after delivering postoperative care via telemedicine following minimally invasive gynecologic surgery.

**Design:** Randomized controlled trial

**Setting:** University based outpatient clinic.

**Patients or Participants:** Between 18 and 60 years of age scheduled to undergo laparoscopic hysterectomy or laparoscopic excision of endometriosis.

**Interventions:** Eligible patients were randomized to receive postoperative care either through a traditional office visit or via telemedicine.

**Measurements and Main Results:** 41 patients were analyzed out of which 25 were allocated to the office group and 16 to the telemedicine group. Groups were homogenous to age (41.4 v 43.3 p=.48), BMI (31.9 v 30.6 p=.52), distance in miles from home (12.7 v 12.4 p=.92) and parity (p=.51). PSQ-18 questionnaire was scored and each category was compared between the office and telemedicine groups. When comparing medians (IQR), the general satisfaction and time spent with doctor categories were significantly higher in the telemedicine group (4.0 (4.0, 4.5) v 4.5 (4.5, 5.0) p=.05), (4.0 (4.0, 4.5) v 4.5 (4.0, 5.0) p=.05). The remainder of the categories analyzed were not different between groups (Technical Quality (4.0 (3.8, 4.5) v 4.5 (3.9, 5.0) p=.13), Interpersonal Manner (4.0 (4.0, 4.5) v 4.5 (4.0, 5.0) p=.34), Communication (4.5 (4.0, 4.5) v 4.5 (4.3, 5.0) p=.21) and Accessibility and Convenience (4.0 (3.5, 4.5) v 4.0 (3.6, 4.5) p=.84)). A chart review was performed, examining the first 30 days after surgery. One (4%) patient in the office group visited the ER following the postoperative visit, and 0 in the telemedicine group (p=.42). Regarding phone calls to the clinic after postoperative visit, 5(20%) patients in the office group incurred in at least one call and 4(25%) did so in the telemedicine group (p=.92).

**Conclusion:** Postoperative care via telemedicine after gynecologic surgery results in higher patient satisfaction, and does not appear to increase the risk of complications.

**Robotic Radical Trachelectomy Using the Double Bipolar Method- Aiming for a Bloodless Operative Field**

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**Study Objective:** To report the application of the double bipolar technique in a patient with 1b1 cervical cancer who wished to preserve her fertility potential.

**Design:** After experiencing 105 cases of laparoscopic and robotic radical trachelectomy with a 5 year survival rate of 98% and the birth of 29 babies
from 51 of these patients who attempted pregnancy, we introduced the double bipolar method to overcome technical difficulties of the procedure due to the necessity for precise dissection and reconstruction in the deep pelvis. We will show our operative techniques, such as nerve sparing radical trachelectomy and retroperitoneal lymphadenectomy for early invasive cervical cancer in a bloodless operative field.

**Setting:** Urban general hospital.

**Patients or Participants:** Robotic radical trachelectomy using the double bipolar method was performed in three patients with Ib1 cervical cancer.

**Interventions:** After Robotic radical trachelectomy using monopolar scissors in 30 cases of stage Ib1 cervical cancer, we considered techniques for a more bloodless operative field. The double bipolar method (DBM) was originated by a robotic gastrointestinal surgeon, Prof Ichiro Uyama. Using robotic Maryland forceps as a cutting device allows for pinpoint accuracy that cannot be found in other instruments. It is important for bladder and ureteral dissection and exposure of vessels. Cuts are made at a very limited point by a lightning strike mechanism, meaning there is minimal thermal spread to adjacent organs.

**Measurements and Main Results:** Blood loss was 250ml in the cases presented. In surgeries not using the DBM (n=34), the blood loss ranged from 350ml (100-1200ml). While there is no supporting data, the dissection of the ureter was very smooth.

**Conclusion:** A bloodless operative field allows for accurate dissection and can prevent intraoperative injuries. The double bipolar method is able to provide precision cutting and limit thermal spread to adjacent tissue, reducing injury and allowing for a clear operative field.

**An Alternate Non Umbilical Entry Port for Laparoscopic Entry in Thin Patients**

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**Study Objective:** To study the feasibility of a non umbilical first blind entry port in patients with BMI less than 18.5.

**Design:** Retrospective study assessing the laparoscopic entry in patients operated during the study period from January 2011 to December 2019.

**Setting:** Patients were operated under general anesthesia.

**Patients or Participants:** Selection criteria was patients of BMI less than 18. Out of the total 7398 patients in which laparoscopic entry was done by the left lateral port, 398 patients met the selection criteria. 70 thin patients had history of previous surgeries.

**Interventions:** In the study group veress needle and first primary port was introduced through a left lateral paraumbilical port about 10 cm lateral to the umbilicus. This point is located on a straight line drawn 2.5cm medial to the ASIS at the level of umbilicus. During veress needle and primary 5mm trocar entry the abdominal wall is not lifted up and veress needle insertion is done in one straight vertical line without changing the direction to 45 degree. Under vision of first 5mm telescope the 10mm port and then accessory ports are inserted. This port placement is aimed direction to 45 degree. Under vision of first 5mm telescope the 10mm needle insertion is done in one straight vertical line without changing the primary 5mm trocar entry the abdominal wall is not lifted up and veress needle.

**Measurements and Main Results:** All 398 cases were entered safely without any major complication or conversion to laparotomy. First blind entry was well delineated due to good muscle tone in thin patients. No long term sequelae noted.

**Conclusion:** Left lateral paraumbilical port is a safe alternate first blind non-umbilical port in thin patients with advantage of avoiding major vascular injury and avoiding adhesions in previous surgery cases.

**An Analysis of Medicare Reimbursement Rates in Hysterectomies Performed in Gynecologic Surgery:**

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**Study Objective:** To investigate differences in Medicare reimbursement rates between type of hysterectomy procedure, including abdominal, vaginal, and laparoscopic/robotic to help guide reimbursement for best practices.

**Design:** Twenty-two reimbursement codes representing hysterectomy from The Physician Fee Schedule Look-Up Tool.

**Setting:** Centers for Medicare & Medicaid Services.

**Patients or Participants:** All patients who had undergone hysterectomy of any type with reimbursement by Medicare using the twenty-two codes represented in The Physician Fee Schedule Look-Up Tool from 2010-2019 in the United States.

**Interventions:** Abdominal, vaginal, or laparoscopic/robotic hysterectomy reimbursed by Medicare.

**Measurements and Main Results:** A total of twenty-two codes were identified and the average annual and total percent change in reimbursement were calculated for abdominal, vaginal, and laparoscopic/robotic hysterectomy. After adjusting for inflation, the average reimbursement for all hysterectomy procedures decreased by 14.97% from 2010 to 2019 with an average R2 of 0.92. The average annual change in reimbursements was 1.75%. Reimbursement for abdominal, vaginal, and laparoscopic/robotic hysterectomies decreased by 7.85%, 10.17%, and 21.16%, with an average R2 of 0.94, 0.96, 0.88, respectively. Annual decrease in reimbursements was 0.90%, 1.18%, 1.56% for abdominal, vaginal, and laparoscopic/robotic respectively. These numbers show a decrease in reimbursement for all hysterectomies, and by hysterectomy type.

**Conclusion:** Medicare reimbursement for hysterectomy declined significantly from 2010-2019. Laparoscopic/robotic hysterectomy reimbursement decreased more than other modalities. With increasing use of laparoscopic/robotic procedures for hysterectomies in gynecologic surgeries due to increased safety, it is critical to understand these reimbursement trends. A minimally invasive approach should be the standard of care for benign hysterectomy, as it has improved patient outcomes and safety. Reimbursement does not reflect this best medical practice as minimally invasive hysterectomy rates decreased more than laparotomy. Further understanding of trends is essential to provide input to policy-makers who determine these reimbursement rates.

**The “Lapbox” Device for Contained Laparoscopic Tissue Morcellation**

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**Study Objective:** Clinical evaluation of LapBox, a novel tissue containment system for power and manual morcellation in laparoscopic gynecologic surgery.

**Design:** Described cases were performed as part of an ongoing First in Human prospective, open label, multi-center, non-randomized study. Primary safety endpoint was non-occurrence of device-related adverse events. Primary performance endpoint was containment integrity (leak testing) following procedure. Secondary endpoints were ease of use, intra or post-operative complications, procedure time, hospitalization duration, specimen weight.

**Setting:** The LapBox extraction device is inserted using a dedicated delivery system. The organ is then encapsulated, and double wall chamber inflated. Chamber opening is extracted offering direct access and view to the contained organ within the inflated abdomen.
A Comparison of Hysterectomy and Prostatectomy
Medicare Reimbursement Rates: 2010-2019
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Study Objective: To investigate differences in Medicare reimbursement rates
between hysterectomy and prostatectomy to understand gender disparities
in healthcare reimbursement.
Design: Ten codes representing hysterectomy and five codes representing
prostatectomy from The Physician Fee Schedule Look-Up Tool.
Setting: Centers for Medicare & Medicaid Services.
Patients or Participants: All patients who had undergone hysterectomy
or prostatectomy with reimbursement by Medicare using the fifteen codes
represented in The Physician Fee Schedule Look-Up Tool.
Interventions: Hysterectomy or prostatectomy reimbursed by Medicare.
Measurements and Main Results: The codes were identified and the
average annual and total percent change in reimbursement were calcu-
lated from 2010 to 2019. After adjusting for inflation, the average reim-
bursement for hysterectomy procedures decreased by 7.85%
and for prostatectomy procedures by 21.16% with average R2 val-
ues of 0.94 and 0.88, respectively. The average reimbursement
for open prostatectomy procedures decreased by 23.61% and by
28.20% for laparoscopic prostatectomy procedures with average R2 val-
ues of 0.86 for both. The average reimbursement rate in dollar amount
for abdominal hysterectomy is $1068.68 and $1,374.25 for open prosta-
tectomy.
The average reimbursement rate in dollar amount for laparo-
osopic hysterectomies and prostatectomies are $1,053.32 and
$1,775.65, respectively.
Conclusion: This study provides an analysis of trends in procedural
Medicare reimbursement for hysterectomy procedures and prostatect-
omy procedures. Medicare reimbursement rates for hysterectomies
have decreased by a smaller amount than prostatectomy procedures,
although average reimbursement for hysterectomy procedures still
remains lower. Reimbursement for procedures are calculated based on
multiple factors, but gender equity should be an important factor for
policy makers. Results from this study show that while male-specific
procedures are still reimbursed more, there is a more rapid decline in
reimbursement rates for male-specific procedures, potentially signaling
movement towards greater equality. Further work must be done to
understand why inequalities still exist in the medical field regarding
reimbursement for sex-specific procedures.

Transvaginal Natural Orifice Transluminal Endoscopic (vNOTES) Hysterectomy: A Novel Route for Uterus
Removal
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Study Objective: To demonstrate the feasibility of Transvaginal Natural
Orifice Transluminal Endoscopic (vNOTES) hysterectomy.
Design: Stepwise demonstration with narrated surgical video.
Setting: A university-affiliated center.
Patients or Participants: A 52-year-old gravida 2, para 2 woman with
a 10 cm fibroid presented with a 2-year history of frequent micturition.
Ultrasound showed fibroids and bilateral ovarian cysts.
Interventions: After injecting dilute vasopressin in the cervix, the vaginal mucosa was incised circumferentially. Posterior and anterior colotomy was made. Then bladder pillars were clamped. Single-site port was successfully placed and pneumoperitoneum was established. After the survey of upper abdomen, progressive clamping from the cardinal ligaments to the level of the broad ligament was performed. Then the proper ligaments of ovary were clamped and bilateral oophorosalpingectomy was performed. The specimen was then delivered to the vagina. The vaginal cuff was closed with running stich.

Measurements and Main Results: The surgery was successfully conducted with operating time of 120 minutes and blood loss of 20 ml. The uterus weighed 410 g. The patient recovered well and had resolution of frequent micturition.

Conclusion: vNOTES is feasible for hysterectomy. Combined with traditional transvaginal colotomy, vNOTES allows the access to the entire abdomen and completion of hysterectomy through a transvaginal single port. Transvaginal NOTES Hysterectomy benefits specimen removal and leads to no abdominal incision.

UCHL1 Promotes Lymph Node Metastasis in Scnec By Reducing PROX1 Ubiquitination
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Study Objective: Small cell neuroendocrine carcinomas of the cervix (SCNEC) are rare tumors with highly aggressive clinical behavior and extremely poor prognosis. Here, we investigate its differential genes and explore the roles of crucial gene for aggressive clinical behavior

Design: Gene expression microarrays and immunohistochemistry were used to screen out candidate genes in SCNEC. Cervical adenocarcinoma and squamous cell carcinoma samples were used as controls. The clinical significance of candidate genes was analyzed by SPSS 22.0, while biological functions were investigated in primary SCNEC cells using siRNA and overexpression. Co-expression network analysis and immunoprecipitation were used to explore molecular mechanisms.

Setting: Cervical adenocarcinoma and squamous cell carcinoma samples were used as controls.

Patients or Participants: Prognostic factors of SCNEC were analyzed in 53 SCNEC patients.

Interventions: None.

Measurements and Main Results: UCHL1, PROX1, CRM5P, and TM4SF1 were identified as preliminary candidates with different positively rates. According to the requirement of a >85% positive rate in sample size calculation, only UCHL1 was identified as a specific gene for SCNEC, which was positively associated with lymph node (LN) metastasis (p=0.003). LN metastasis was significantly related to a worse prognosis of SCNEC patients (P=0.021, HR =3.49, 95% CI 1.20-10.09). Scratch migration and transwell invasion assays indicated that the migration and invasion abilities of primary SCNEC tumor cells were significantly higher following UCHL1 overexpression and decreased by downregulation (P<0.001). Co-expression network analysis suggested that PROX1 might interact with UCHL1, and in vivo immunoprecipitation and western blots verified that levels of ubiquitinated PROX1 decreased significantly following UCHL1 overexpression (P<0.001). Immunohistochemistry indicated that UCHL1 expression was positively correlated with PROX1 in SCNEC samples (R=0.766, P<0.001).

Conclusion: UCHL1 is highly expressed in SCNEC and positively associated with lymph node metastasis. Mechanistically, UCHL1 promotes migration and invasion by reducing PROX1 ubiquitination.

Laparoscopic and Robotic Mesh-Free Suture
Hysterectomy Versus Mesh Sacral Hysterectomy: A Non-Randomised Comparison
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Study Objective: To compare the laparoscopic and robotic mesh-free suture hysterectomy (SutureH) with mesh sling sacral hysterectomy (MeshH) for uterine prolapse.

Design: A retrospective clinical audit of consecutive women who underwent SutureH or MeshH by laparoscopic or robotic route by a single surgeon. Subjects were assessed at baseline, 5-weeks and 1-year.

Setting: N/A

Patients or Participants: N/A

Interventions: SutureH uses sutures to re-support the uterus from each uterosacral ligament. During MeshH, the uterus is suspended form a mesh sling placed around the cervix. All women had a post-operative surgical support pessary placed for 5 weeks.

Measurements and Main Results: The primary outcome was success defined as a composite of: POP-Q C-point above the hymen, absence of vaginal bulge symptom, and no repeat prolapse surgery or pessary placement. Secondary outcomes included subjective improvement in prolapse symptoms using PGI-I, POP-Q C-point change, change in POP-Q scores and complications.

228 women underwent laparoscopic or robotic hysterectomy between Sept 2010 and Oct 2018. The 1-year data was available for 191 women (MeshH n=120; SutureH n=71). Success was not different between MeshH and SutureH (P=0.114). For MeshH v’s SutureH, C-point at or above +1cm, absence of bulge and no repeat surgery was 99.2% v’s 95.8%, 90.8% v’s 90.1% and 81.7% v’s 84.5% respectively (NS). MeshH (mean C point -7.14 cm) provided better apical support than SutureH (mean C point -5.9) (P<0.001) even when age was controlled for. PGI-I was not different between the groups when age was controlled for (P=0.059). Complications for MeshH versus SutureH were dyspareunia, stress incontinence and pelvic pain of 5.8% v’s 4.2%, 5.8% v’s 5.6% and 3.3% v’s 5.6% respectively.

Conclusion: Laparoscopic and robotic sutureH and meshH provide women with minimally invasive durable options for uterine preservation during pelvic organ prolapse surgery. When controlling for age, MeshH provided better anatomic support than SutureH although SutureH gives women a mesh-free option.

Diagnosis and Management of Vaginal Foreign Body in the Pediatric Patient Using Vaginoscopy: A Case Report
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Study Objective: To present a pediatric case with nonspecific vaginal symptoms where exam under anesthesia and vaginoscopy were indicated as a diagnostic and therapeutic measure. To review the strengths of vaginoscopy in this specific population. To describe vaginoscopy instrumentation and techniques given the infrequent use of this modality in gynecologic practice.

Design: Case Report.

Setting: Academic Hospital.

Patients or Participants: A 5-year-old pre-pubertal female presented with persistent vaginal discharge and spotting for four months. Prior workup and treatment included empiric antibiotics given for urinary tract infection and wet prep and vaginal cultures that were unrevealing.

Interventions: Vaginoscopy was performed in the operating room under general anesthesia using a 6mm 0-degree operative hysteroscope and visualization of the vaginal cavity using saline media.

Measurements and Main Results: Visualization of the vaginal cavity demonstrated multiple foreign bodies including nine 1-cm rubber-bands, one 3-cm LEGO toy, and multiple fragments of toilet paper. The foreign bodies were removed using flexible graspers without complications. Visualization of...
the vaginal cavity and cervix thereafter ensured complete removal of all foreign objects (photos available). Care was taken to document examination of the external genitalia and hymen preceding vaginoscopy in the event that further investigation for sexual abuse was warranted.

**Conclusion:** Vaginoscopy is a minimally invasive tool critical in the diagnosis and management of pediatric vaginal symptoms including evaluation for presence of foreign bodies. A multitude of hystero- or cystoscopes can be used for evaluation of vagina, however an operative channel is required in case there is a need for a biopsy or removal of a foreign body. Zero-degree optics are preferable. Benefits include preservation of hymenal integrity, enhanced visualization of the vaginal cavity, and increased flexibility in obtaining samples and removing foreign bodies.

**Surgical Approach to Distorted Anatomy: What to Do When Nothing Looks Normal!**

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**Study Objective:** To demonstrate basic laparoscopic principles in cases where the anatomy is distorted.

**Design:** Surgical tutorial.

**Setting:** A single tertiary care academic institution.

**Patients or Participants:** All patients undergoing laparoscopic hysterectomies.

**Interventions:** To demonstrate basic surgical principles in cases where the anatomy is distorted.

**Measurements and Main Results:** Various techniques can help in cases where the anatomy is distorted.

**Conclusion:** Knowledge of retropitoneal anatomy, backfilling the bladder, and correct identification of the endopelvic fascia are key components in performing difficult hysterectomies.

**Removal of Indwelling Catheter Following Benign Laparoscopic Hysterecctomy: Does Timing Matter?**

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**Study Objective:** It is standard procedure to place an indwelling catheter during a benign laparoscopic hysterectomy. However, timing of removal after surgery remains controversial due to risk of UTI and recatheterization. This study investigated if the timing of foley removal influenced clinical outcomes and factors influencing timing of removal.

**Design:** Retrospective study.

**Setting:** Single center hospital.

**Patients or Participants:** 281 women that underwent benign laparoscopic hysterectomy in 2018 and did not require bladder suspension and concomitant vaginal surgery.

**Interventions:** Foley catheter removed either immediately after surgery in the operating room (ICR), or delayed catheter removal (DCR) either in the post-anesthesia care unit (PACU) – (DCR-PACU) or on post-operative day one (DCR-POD1).

**Measurements and Main Results:** There were 108 patients in the ICR group, 22 patients in the DCR-PACU group and 151 patients in the DCR-POD1 group. Baseline characteristics such as BMI, age, indications for hysterectomy, uterine weight, and ASA class were similar. DCR-POD1 group patients had longer operative times compared to ICR and DCR-PACU, 158 vs 120 vs 115 minutes, (p-value<0.001), and more intra-operative complications, 3% vs 1% vs 0%. DCR-POD1 patients had the highest UTI rate when compared to the DCR-PACU and ICR patients, 7% vs 5% vs 3% (p-value=0.372), although the ICR group had a higher urinary retention rate, 21% vs 14% for DCR-PACU vs 13% for DCR-POD1 (p-value=0.161). Readmission and other post-operative complication rates were similar between the ICR and DCR-POD1 groups, with none in the DCR-PACU group.

Multivariate logistic regression revealed that the timing was not significant, after controlling for factors such as case complexity and use of scopolamine patches.

**Conclusion:** Although ICR was associated with higher urinary retention rate, this did not appear to be statistically significant when the use of scopolamine patch and case complexity was controlled for. ICR should still be considered so as to maximize the benefits of minimally invasive surgery and increase patient satisfaction.


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**Study Objective:** To demonstrate the distorted anatomy of the pelvis caused by the coincidence of deep endometriosis and leiomyomas impairing fertility. Also, highlight the robotic approach assisting for a precise landmark identification and nerve-sparing dissection in order to perform a safe procedure.

**Design:** Case report for anatomical study and description of the procedure using video.

**Setting:** Under general anesthesia, the patient was placed in dorsolithotomy position, arms alongside the body and legs 80o abducted in adjustable stirrups. Legs were dressed under anti-embolism stockings and pneumatic compression. A Foley catheter and a uterine manipulator were placed at the onset of the surgery.

**Patients or Participants:** A 40-year-old nulliparous woman presents with infertility along 7 years and unsuccessful previous treatments. She underwent two fibroid embolizations and two in vitro fertilizations (IVF). In the physical examination her uterus was enlarged and partially fixed and she had a painful bulging tumor in the posterior vaginal fornix. The MRI evidenced a 121,7cc uterus with multiple nodular formations, a 2.5 cm retracting retrocervical lesion infiltrating the rectum muscular wall (30%) at 12 cm from the anal border and an endometrioma of 4.7 cm in the left ovary displacing it medially. Despite the infertility she had no other complaints.

**Interventions:** We performed a robot-assisted laparoscopic enucleation of multiple fibroids and resection of superficial and deep endometriosis lesions including peritoneum, uroteral ligaments, left ovarian endometrioma, cephal appendix and rectosigmoid.

**Measurements and Main Results:** Patient was discharged in the second postoperative day, with mild abdominal pain. She used dienogest for another five months and three months after stopping the medication she spontaneously became pregnant.

**Conclusion:** We were able to achieve a favorable outcome regarding the surgical approach in resecting an extensive disease and the patient’s intention of childbearing.

**Polishing Your Golden Laparoscope: Tips for Laparoscopic Videography Success in & out of the Operation Room**

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**Study Objective:** Discuss the necessity of high-quality laparoscopic videography for education of trainees, practicing surgeons, and patients. Discuss the advantages of surgical videography education. Demonstrate tips and tricks for successful laparoscopic videography in and out of the operation room.

**Design:** 6-minute educational video demonstrating tips and tricks for successful laparoscopic videography in and out of the operation room.

**Setting:** N/A
Patients or Participants: Surgical videography education for medical students, residents, practicing surgeons, and patients.

Interventions: N/A

Measurements and Main Results: N/A

Conclusion: Key editing techniques of highlighting anatomy and anatomical relationships in addition to shape and symbol insertion has the ability to produces high quality surgical videos for the education of trainees, practicing surgeons, and patients. The absolutely necessity of surgical videography education has become vitally apparent due to recent social-distancing precautions.

Incisional Hernia after Single-Port Access Laparoscopic Gynecologic Surgery: A Retrospective Study of 2,498 Cases over a 10-Year Period

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Study Objective: The present study was conducted to report the perioperative outcomes of single-port access laparoscopic gynecologic surgeries with focus on the incidence of postoperative incisional hernia from our cumulative data of 2,498 patients.

Design: A retrospective cohort study.

Setting: A tertiary urban academic medical center in Seoul, South Korea.

Patients or Participants: Women between 19 – 65 years old who underwent single-port access laparoscopic surgeries for gynecologic diseases between 2008 and 2018.

Interventions: A total of 2,498 Korean patients received single-port access laparoscopic surgeries. Running suture of the fascial layer was performed in the first 515 patients whereas interrupted suture of the fascial layer was done in the latter patients. During the interrupted sutures, the port system remained in situ. By gently pulling the remaining port system towards one lateral side, surgeons were able to identify the fascial layer of the other lateral side more clearly, thereby throwing distinct and proper stitches. The sutures were not tied until all stitches were completed.

Measurements and Main Results: The median age of the patients was 40.3 ± 9.2 years, and the mean body mass index (BMI) was 22.6 ± 3.2 kg/m². A total of 3 postoperative incisional hernia occurred during the study period. Two patients whose fascial layers were closed in running sutures developed hernias 6 and 8 months after their operations. One patient whose fascial layers were closed in interrupted sutures developed hernia 11 months after her operation.

Conclusion: The incidence of postoperative incisional hernia following single-port access laparoscopic surgery is low in Asian women whose BMI is relatively lower than other patient populations. Interrupted suture technique may reduce postoperative incisional hernia by providing a distinct visualization of fascial layers during closure.

“Addressing the Opioid Epidemic at the Front Lines”: Surveying Opioid Prescribing Practices of Obgyn Residents across Canada

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Study Objective: Opioid over-prescription in surgical patients has been described as a leading contributor to the opioid epidemic. At academic centres, the discharge prescription is often written by the resident. The objective of this study is to identify the prescribing practices of gynecology residents to manage post operative pain.

Design: This is a cross-sectional survey to elicit gynecology residents’ opioid prescribing habits. The anonymous study was disseminated to residents via email.

Setting: N/A.

Patients or Participants: The inclusion criteria was any resident enrolled in postgraduate years (PGY) 1 to 5 at a Canadian OB/GYN residency. Staff OB/GYNs, fellows, and cross specialty trainees were excluded. 486 residents were emailed the survey with 102 responses.

Interventions: N/A.

Measurements and Main Results: Respondents encompassed all five years with the majority of respondents as PGY-4 (28). Up to 67% of trainees reported having formal training on pain management including 100% of PGY-1s and 53% of PGY-5s. The average MME (Morphine Milligram Equivalents) prescribed for total laparoscopic hysterectomy (TLH) was 37.5 (standard deviation [SD]=64) compared to 68.5 (SD=39.3) for total abdominal hysterectomy (TAH). For TLH, PGY-1s prescribed an average of 18 whereas PGY-5s prescribed the highest (43, p=0.078). Regional differences in prescribing demonstrated the highest average MME in Western provinces (70.8) compared to the lowest in Eastern provinces (11.9, p=0.072). Procedure type was listed as the most influential factor by 65%, with patient factors (35%) and staff preference (33%) being the next most influential. Only 25% of respondents felt comfortable prescribing non-opioid alternative therapies. The majority of respondents (46%) report rarely or never counselling patients on safe opioid disposal.

Conclusion: Senior residents appear to prescribe higher MME and have lower rates of pain management education. Targeted resident education and interventions focussed on shared decision making between patients and providers could reduce MME prescriptions. Trainees would benefit from education on non opioid alternative therapies and safe opioid disposal.

The Bermuda’s Triangle a Didactic Description of the Retroperitoneal Anatomy

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Study Objective: The objective of this video is to teach an ‘effective’ technique to find and clip the uterine arteries, previous to a total laparoscopic hysterectomy (TLH).

Design: video article.

Setting: Private Hospital.

Patients or Participants: N/A

Interventions: Hysterectomy is one of the most common surgical procedures around the world; Just in the USA, around 600,000 procedures are done yearly. The total laparoscopic hysterectomy has become one of the most common used techniques.

According to the actual literature, the complication rate is in the range of 5.7/1000 procedures and bleeding is one of the most stressful complications.

The purpose of this video article is to describe The Bermuda’s Triangle a very didactic description of the retroperitoneal vascular anatomy; With this description, it will be extremely easy to find and clip the uterine arteries, before performing a total laparoscopic hysterectomy.

We named The Bermuda’s Triangle, because on the Atlantic Ocean the Bermuda’s triangle is one of the most enigmatic and scare places, the same happened with the retroperitoneal space With the uterine arteries occluded, we decrease the uterine blood supply by 79%.

After the initial anatomic pelvic inspection, we will see the pelvic side wall, we can draw an inverted triangle, that is formed from the superior side by utero-ovarian ligament; from the inferior side by the ureter and from the external side from the IP ligament, at the middle of the triangle we are gaining access into the retroperitoneal space; it will be quite easy to identify the vascular structures, nerves and ureter.

The internal iliac artery will be identified, giving a bifurcation into uterine artery and superior vesical artery. The titanium clips are placed on the uterine artery.

Measurements and Main Results: N/A

Conclusion: The uterine arteries are clipped at the base, in an extremely easy and safe style. Doing this, we are decreasing the chances of a hemorrhage.
**Hysteroscopic Subendometrial PRP Injection in Cases of Infertility**

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**Study Objective:** To determine the efficacy of Hysteroscopic subendometrial Platelet Rich Plasma (PRP) injection in improving endometrial thickness and pregnancy rates in IVF cases.

**Design:** Case-control Study.

**Setting:** Patients had hysterectomy under general anaesthesia or office settings according to their preference, in the dorsal lithotomy position.

**Patients or Participants:** 51 patients with history of recurrent IVF failure or thin endometrium (<7mm)

**Interventions:** Hysteroscopic subendometrial injection of autologous PRP using a wallace needle through the hystroscope’s operating channel to inject the PRP beneath the superficial endometrium in novel technique.

**Measurements and Main Results:** Endometrial thickness was measured sequentially post-operative and pregnancy rates following embryo transfer recorded.

**Conclusion:** PRP injection significantly improves endometrial thickness and more studies are needed to ascertain pregnancy rates and live birth rates.

**Hysteroscopic Myomectomy for Type 2&amp;3 Myomas**

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**Study Objective:** To determine the optimal management of type 2 and type 3 myomas affecting menstrual blood loss and infertility

**Design:** case series, 2 year follow up.

**Setting:** hysterectomy under general anaesthesia in the dorsal lithotomy position.

**Patients or Participants:** 86 infertility or recurrent pregnancy loss patients diagnosed with a type 2 or type 3 myoma (<5cm).

**Interventions:** Hysteroscopic myomectomy with techniques for accessing deeply intramural myomas by resectoscopy and cold techniques shown videographically to avoid laparoscopic and open techniques which require a more invasive surgery and myometrial incision. Prevention of hysteroscopic complications such as volume overload, perforation and bleeding through precise surgical technique and set-up.

**Measurements and Main Results:** Complete resection of the myoma is the primary outcome. 78/86 patients had a successful myomectomy in 1 setting, 8/86 patients required a second setting. Secondary outcome is pregnancy where 75.5% pregnancy rate was achieved within one year of the procedure.

**Conclusion:** Hysteroscopic myomectomy is a valuable approach in cases of type 2 and type 3 myomas <5cm in infertility patients and can avoid the more invasive laparoscopic and open approach.

**Hysteroscopic Management of Cesarian Scar Ectopic Pregnancy**

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**Study Objective:** To determine the efficacy of hysteroscopy in managing cesarian scar ectopic pregnancy.

**Design:** Case series.

**Setting:** Hysteroscopy under general anaesthesia in the dorsal lithotomy position.

**Patients or Participants:** 15 patients diagnosed with cesarian scar ectopic pregnancy with no hemodynamic instability or signs of hemoperitoneum.

**Interventions:** Hysteroscopic management of the pregnancy sac or products of conception at the site of the cesarian scar following methotrexate injection. Cold loop and electrocautery were both used to resect the entirety of the chorionic tissue.

**Measurements and Main Results:** Ultrasonography performed postoperatively to determine the efficacy of complete removal of the cesarian scar ectopic pregnancy and HCG levels serially monitored. Intra-operative blood loss measured. 14/15 patients had complete removal of the ectopic tissue in one setting, 1/15 patients required a second setting due to failure of resolution of her symptoms. None of the patients had significant blood loss in the procedure.

**Conclusion:** Hysteroscopy can be used to manage Cesarian Scar ectopic pregnancy in a minimally invasive approach.

**Adenomyosis, a Predictor of Endometriosis Severity? a Pilot Study.**

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**Study Objective:** Are sonographic features of adenomyosis associated with the three endometriosis phenotypes, superficial peritoneal endometriosis (SPE), ovarian endometrioma (OE) and deep infiltrative endometriosis (DE)?

**Design:** This retrospective cohort study analyses the presence of sonographic features of adenomyosis in reproductive age women with suspected endometriosis who underwent laparoscopic surgery at Liverpool Hospital during 2018-20 period.

**Setting:** N/A

**Patients or Participants:** 73 women of reproductive age with suspected endometriosis (pelvic pain or infertility).

**Interventions:** Women underwent a specialized transvaginal ultrasound (TVUS) by a single expert sonologist, to diagnose deep endometriosis and adenomyosis using the IDEA (International Deep Endometriosis Analysis) and MUSA (Morphological Uterus Sonographic Assessment) diagnostic criteria. All women underwent laparoscopic surgery within 6 months of the TVUS by an advanced laparoscopic surgeon, who documented intraoperative and histopathological findings.

**Measurements and Main Results:** The mean age was 35 years. 53/73 (73%) women had endometriosis at laparoscopy. 20/73 (27%) women had features of adenomyosis on TVUS with 14/20 of these women having endometriosis. 6/14 (43%) had DE with pouch obliteration, 7/14 (50%) had SPE and 1/14 (0.1%) had OE. Overall, the most common feature of adenomyosis at TVUS for women with endometriosis was heterogenous myometrium. Echogenic subendometrial lines was the most common TVUS feature for women with DE, whereas heterogenous myometrium was the most frequent TVUS features for women with SPE. An irregular interrupted junctional zone was the most common TVUS feature in women without endometriosis.

**Conclusion:** Women with adenomyosis at TVUS appear to be at high risk (70%) of concurrent endometriosis. 43% of women with adenomyosis at TVUS had advanced endometriosis (DE w pouch obliteration), with echogenic subendometrial lines the most common sonographic feature of adenomyosis. Further studies are needed to confirm whether specific features of adenomyosis at TVUS are associated with endometriosis phenotype, which in turn may aid in surgical planning for these women.

**New Preoperative Adhesion Scoring System Using Transvaginal Ultrasonography for Endometriosis**

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**Study Objective:** To investigate the accuracy and clinical value of a new adhesion scoring system using transvaginal ultrasonography for endometriosis.

**Design:** Prospective observational study.
Severe Dysmenorrhea Is the Primary Contributor to Low Physical Quality of Life in Canadian Women with Endometriosis

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Study Objective: (1) To compare quality of life (QoL) in women presenting for endometriosis care at a Canadian tertiary care centre to the general population and (2) to identify significant factors associated with reduced physical and mental QoL.

Design: Prospective observational questionnaire study.

Setting: Tertiary academic hospital.

Patients or Participants: Women with clinically suspected or surgically confirmed endometriosis.

Interventions: Participants were recruited at the time of consultation and completed the Medical Outcome Survey (SF-36) and the Endometriosis Phenome and Biobanking Harmonization Project Minimum Clinical Questionnaire prior to treatment. SF-36 scores were compared to the Canadian normative data for women aged 35-44 years. Logistic regressions (controlled for co-morbidities) were performed for patient reported demographics, endometriosis related symptomology, endometriosis type, treatment history and diagnostic delay with high and low physical (PCS) and mental (MCS) component summary scores as the outcome. Significant factors (p<0.05) were entered into a final regression model.

Measurements and Main Results: Ninety participants completed the questionnaires. Sixty-two (69%) patients presented with deep, 8 (9%) with ovarian, and 18 (20%) with superficial endometriosis. Two (2%) participants were excluded after surgical confirmation of no endometriosis. Endometriosis participants scored significantly less in all SF-36 subdomains than the Canadian women normative data (mean difference=16-47%). Significant factors associated with the low PCS scores were age dysmenorrhea began (OR=0.92, 95% CI=0.85-0.99), severe dysmenorrhea (OR=4.85, 95% CI=1.58-14.89), dyspareunia (OR=10.26, 95% CI=1.26-86.47), dysuria (OR=39.95% CI=1.47-13.01), non-cyclic pelvic pain (OR=4.05, 95% CI=1.36-12.06), and number of endometriosis symptoms (OR=2.02, 95% CI=1.29-3.18). In the final model, only severe dysmenorrhea remained significantly associated with low PCS score (OR=5.27, 95% CI=1.06-33.73). No factors were significantly associated with MCS scores.

Conclusion: Endometriosis negatively impacts women’s QoL with scores up to 47% less than the general population. Severe dysmenorrhea was the primary contributor to poor physical quality of life, highlighting the importance of treating endometriosis-associated menstrual pain as a primary outcome in this patient population.

The Impact of a Handheld Portable Hysteroscope on Physician Management Plans for Abnormal Uterine Bleeding

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Study Objective: Abnormal uterine bleeding (AUB) assessment involves uterine cavity evaluation, via ultrasound (US), saline-infusion sonography (SIS), endometrial biopsy, or hysteroscopy. Reducing diagnostic delay may improve patient experience and reduce healthcare costs. A portable handheld in-office hysteroscope introduced for assessment of AUB,
requiring minimal equipment and costs, is well-tolerated by patients and a safe and effective alternative to operative hysteroscopy. By ensuring prompt diagnosis and treatment and reducing further investigations, gynecological practice could be enhanced, promoting efficiency, patient and physician experience and lessening healthcare system impact. The objective of this study is to compare physician diagnosis and management plans before and after hysteroscopy at consultation for AUB.

**Design:** Prospective observational questionnaire study.

**Setting:** Canadian tertiary gynecological care center.

**Patients or Participants:** Staff gynecologists.

**Interventions:** Sixty-six uterine assessments were performed using a portable handheld hysteroscopy (Endosee, Cooper Surgical Inc.) at time of consultation for patients referred for AUB. Physicians (n=6) completed questionnaires regarding diagnoses and management plans pre- and post-procedure.

**Measurements and Main Results:** Sixty-two of 66 cases (94%) were successfully completed (reasons for incomplete procedures were cervical stenosis [n=3] and patient discomfort [n=1]), resulting in diagnosis change in 76% (n=47/62) of patients and management plan change in 92% (n=57/62) of patients, with 57% (n=35/62) of patients requiring no further surgery or imaging. In 74% (n=46/62) of cases there was an overall reduction in the number of required procedures, with 56% (n=23/41) of provisional surgical procedures and 80% (n=24/30) of provisional imaging procedures being avoided post-hysteroscopy. Normal uterine cavity was reported in 40% (n=25/62) of completed cases.

**Conclusion:** Incorporating portable handheld hysteroscopy at consultation for AUB resulted in diagnosis and management plan change in almost all cases and significant reduction of further procedures, considerably reducing delay to targeted treatment. The potential cost savings and reduced waste in our health care system should be further investigated with the introduction of this simple-to-use technology.

**Sentinel Lymph Node Biopsy for Early Stage Endometrial and Cervical Cancer Performed By Surgeons in Training**

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**Study Objective:** The aim of this study was to evaluate the results of the sentinel lymph node (SLN) biopsy performed by doctors in training.

**Design:** Prospective single-armed interventional study.

**Setting:** All sequential patients treated in a referral cancer center, from 2016 to 2020. IRB approved.

**Patients or Participants:** 126 patients, over 18y.o., with a prior diagnosis of initial endometrial (EC) or cervical (CC) cancer.

**Interventions:** Patients were submitted to SLN biopsy performed by surgical oncology residents or gynecologic oncology fellows, under direct supervision of a qualified preceptor. SLN was detected with blue dye with or without scintigraphy.

**Measurements and Main Results:** Patients underwent surgery by laparotomy - 22 surgeries (17.46%), by laparoscopy - 86 (81.13%) and by robotic - 18 (16.98%). SLN detection rate was 84.1% (n=106), bilateral in 53% (n=67) and mostly in younger patients (59.7% under 60y.o., p=0.022). There was a higher failure rate (non or unilateral detection) among older than 60y.o. (p=0.0075, CI:0.1656-0.7928, OR:0.3664). Among non-smokers, there was a greater bilateral detection of LNS (60.3%), and, among smokers, more cases of detection failure (59.4%). In 3 cases, the SLN was not identified, and there were positive pelvic nodes in the lymphadenectomy. There were no cases with positive nodes at lymphadenectomy with a negative SLN (false-negative). Mean surgical time was 217min and mean blood loss 116cc. Four patients had grade 3 complications, and none died.

**Conclusion:** We have demonstrated that residents and fellows can safely perform SLN biopsy for initial CC and EC under the direct supervision of a trained surgeon. Detection rates were aligned to the literature, and there were no false negatives. Lymph node positivity, age over 60y.o. and smoking were associated with a higher SLN non-detection rate.

**Evaluation of Cell Ratios in Routine Laboratory Tests As a Prognostic Factor for Surgical Intervention in Tubo-Ovarian Abscess**

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**Study Objective:** To identify novel markers in routine laboratory tests associated with surgical intervention in patients with tubo-ovarian abscess (TOA).

**Design:** Retrospective cohort study.

**Setting:** Tertiary university-affiliated hospital.

**Patients or Participants:** Two hundred and eighty-five patients were diagnosed with TOA based on sonographic and clinical criteria. We conducted two analyses, The first between patients managed conservatively and those operated at any time since admission. The second compared between patients that after 48 hours of conservative treatment required a surgical intervention and those who completed conservative treatment with no need for surgical intervention.

**Interventions:** Electronic medical records were used to identify patients who were diagnosed with TOA between 2007 and 2018. All patients received the same antibiotic regimen upon admission. The data extracted included laboratory results and vital signs. Inflammatory markers such as neutrophil to lymphocyte ratio (NLR),lymphocyte to monocyte ratio (LMR), platelet lymphocyte ratio (PLR),white blood cell count(WBC) and C-reactive protein(CRP) levels were compared. A logistic regression model was used to determine the independent predictors of conservative treatment failure.

**Measurements and Main Results:** When comparing cell ratio from complete blood count on admission, between patients who underwent surgical intervention and those successfully treated with antibiotics, we found a statistically significant difference in WBC, CRP, NLR,LMR and PLR (P-value <0.05). After logistic regression analyses NLR at admission was found as an independent risk factor for treatment failure (odds ratio [OR], 1.05; 95% confidence interval [CI], 1.02-1.09). When comparing patients who had surgical intervention after 48 hours of conservative treatment to patients managed conservatively again WBC, CRP, NLR, LMR and PLR all found to be significantly different (P-value <0.05) while after logistic regression NLR at admission was found as an independent risk factor for treatment failure (odds ratio [OR], 1.09; 95% confidence interval [CI], 1.00-1.19)

**Conclusion:** NLR upon admission can serve as a novel marker for prediction of antibiotic treatment failure for TOA.

**Incidental Finding of Stage IV Endometriosis during Laparoscopic Hysterectomy for Fibroid Uterus**

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**Study Objective:** To describe the surgical techniques used to assist management of incidental stage IV endometriosis during laparoscopic hysterectomy of a large, multi-fibroid uterus.

**Design:** N/A

**Setting:** A 38-year-old G2P2 with past medical history significant for fibroids and iron-deficiency anemia and past surgical history of two cesarean sections presented to clinic requesting definitive management of heavy bleeding and pain. She had a pelvic ultrasound which demonstrated multiple uterine fibroids, with the largest having maximum dimension of 7.2cm. She also underwent an MRI, which again identified numerous uterine...
leiomyoma, but also demonstrated a complex left ovarian cyst measuring 5.4 cm, not seen on the prior ultrasound.

Patients or Participants: N/A

Interventions: The patient was scheduled for a total laparoscopic hysterectomy with bilateral salpingectomy, possible oophorectomy. Given proper pre-operative planning, the surgery was able to be kept laparoscopic despite complete obliteration of the posterior cul-de-sac and right adnexa being completely adherent to the sidewall due to presence of endometrioma. This video shows the techniques used and identifies tips used to safely perform a laparoscopic hysterectomy in the setting of dense adhesions and incidental finding of stage IV endometriosis.

Measurements and Main Results: N/A

Conclusion: This patient was incidentally found to have stage IV endometriosis, which complicated her already challenging surgery given a multi-centric, which complicated her already challenging surgery given a multi-centric.

Pre-Operative Risk Factors of Transfusion during Myomectomy
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Study Objective: Identify pre-operative risk factors for transfusion during abdominal myomectomy.

Design: Retrospective cohort study.

Setting: Academic Medical Center.

Patients or Participants: Patients undergoing abdominal myomectomy by a single surgeon between 2010 and 2016.

Interventions: Pre-operative patient characteristic data, intra-operative data, and peri-operative transfusion and blood loss data were collected retrospectively. Prior Pelvic Surgery was defined as myomectomy, cesarean section, and/or endometriosis surgery; Transfusion was defined as intra-operative cell salvage transfusion, intra-operative allogeneic transfusion, and/or post-operative allogeneic transfusion. Composite Blood Loss Morbidity was defined as presence of any transfusion, reoperation after myomectomy, hematocrit nadir ≤21, and/or estimated blood loss (EBL) ≥1000mL. Logistic regression analysis of risk factors for transfusion was performed.

Measurements and Main Results: 554 patient charts were available for review. Eighty (14.4%) patients underwent transfusion as a result of myomectomy (66 (12%) intra-operative cell salvage, 2 (0.4%) intra-operative allogeneic, and 30 (5.4%) post-operative allogeneic). Women with prior pelvic surgery (OR 3.1), prior myomectomy (OR 2.6), prior endometriosis surgery (OR 5.1), prior UAE (OR 6.3), large uterine size ≥20 weeks (OR 4.8), large fibroid (≥10cm) on MRI (OR 2.1), low preoperative hematocrit <30% (OR 2.4), long myomectomy surgery >2.3 hours (OR 9.7), or many (≥50) fibroids removed (OR 2.1) had significantly greater odds of having a transfusion (P<0.05). These risk factors also significantly increased the odds of composite blood loss morbidity, intra-operative transfusion (except low hematocrit), and post-operative transfusion (except large fibroid). All unadjusted significant findings remained statistically significant after analysis adjusted for age, BMI, and parity. Prior cesarean section or suspicion of adenomyosis on MRI did not increase the odds of transfusion.

Conclusion: Knowledge of patient risk factors for transfusion as a result of abdominal myomectomy is crucial for patient counseling and peri-operative planning.

Assessment of Feedback Mechanisms in Robotic Surgery Curriculum in Obstetrics and Gynecology Residency
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Study Objective: Overcoming the learning curve in robotic surgery requires appreciable effort. A structured curriculum in robotic gynecologic surgery was established for residents at an academic teaching hospital. This study aimed to explore resident experience with robotic surgery and training and to elicit resident preferences for feedback within the curriculum.

Design: A survey assessing demographics, surgical preparation methods, robotic surgical experience and comfort, and feedback preferences was distributed electronically to current obstetrics and gynecology (OB/GYN) residents. Responses were analyzed with descriptive statistics.

Setting: This study was conducted in the OB/GYN residency at Northwestern University in Chicago, IL.

Patients or Participants: The survey was sent to the 47 current OB/GYN residents in the academic year 2019-2020. A total of 29 responses were elicited.

Interventions: N/A

Measurements and Main Results: Eighteen residents (18/29; 62%) reported console experience in at least one robotic surgery. Most (26/29; 90%) stated that prior to operating on the robotic console they felt uncomfortable or very uncomfortable. Prior to console experience, residents primarily used online videos (62%), VR simulation (48%) or observation of live surgery (48%) as preparation. Of note, 7 (24%) residents reported no preparation prior to robotic surgery; these were PGY1 or PGY2 residents who also reported no prior console experience. After console experience, ongoing preparation techniques remained similar, although more residents reported in engaging in pre-operative preparation. All reported that they do receive feedback on surgical skills, but perception of usefulness, timeliness, and structure varied. Feedback was reported as useful and timely, but not well-structured. Most residents (28/29, 97%) indicated that they would prefer real-time feedback immediately after console experience.

Conclusion: OB/GYN residents report that they are not comfortable with robotic surgery training. Current practices for preparation include self-directed activities, but they do not begin until after surgical console experience. This study demonstrates that early initiation of structured learning with feedback is necessary.

Abdominal Ectopic Pregnancy with Retrocervical Localization

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Study Objective: To present an abdominal ectopic pregnancy with a retrocervical localization and laparoscopic management performed.

Design: N/A

Setting: Private health facility.

Patients or Participants: 36 years old female patient with obstetric history of 4 previous miscarriages and 2 cesarean sections presented at our clinic with a chief complain of abdominal pain and 7 weeks amenorrhea. Blood hCG level was 3500 mU/mL. Endovaginal ultrasound revealed an abnormal implantation of a gestational sac, behind the uterus, at the recto-vaginal space. The endometrial cavity was normal.

Interventions: Emergency laparoscopy was performed. Initial assessment of the pelvic cavity revealed blood at cul the sac and normal adnexa from both sides. Careful assessment of structures led to identify an active bleeding spot at the insertion site of the right uterosacral ligament. Trough suction organized tissue was obtained from a peritoneal defect at the bleeding site, making us suspect the gestational sac was implanted at this level. The pararectal space was developed, identifying and lateralizing the hypeogastric nerve. The uterosacral ligament was detached from its proximal end, managing to expand the peritoneal window with the certainty that important anatomical structures were not involved. This gave access the implantation site of the gestational sac that was removed and hemostasis with bipolar energy was performed.

Measurements and Main Results: N/A
Conclusion: Knowledge of the pelvic anatomy is fundamental in the management of any pathology, especially when we encounter surprises such as an abnormal and unusual implantation site of a gestational sac, as observed in the case presented.

Minimally Invasive Treatment of a Rare Condition Causing Chronic Pelvic Pain: Vascular Entrapment of the Lumbosacral Plexus

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Study Objective: To report outcomes of the vascular entrapment of the sacral plexus treated by minimally invasive surgery.

Design: Retrospective cohort study.

Setting: Tertiary unit specializing in advanced gynecologic surgery and neuropelvicoology.

Patients or Participants: A total of 23 patients suffering from chronic pelvic pain with the involvement of the lumbosacral plexus were included in this study. 9 out of 23 patients underwent robot-assisted laparoscopic surgery and conventional laparoscopic surgery with 3D technology were performed in 14 patients for treatment of the vascular entrapment of the lumbosacral plexus.

Interventions: Laparoscopic or robot-assisted laparoscopic excision of the abnormal vessels located on the lumbosacral plexus and decompression of the nerve roots.

Measurements and Main Results: The main age of the patients was 35.13. All patients were suffering from chronic pelvic pain and the most common coexisting symptoms were dysmenorrhea, sciatica, vulvodynia and pudendal neuralgia. Motor deficit was seen only in two patients. Vascular entrapment was visualized on the left side in 16 patients and on the right side in 7 patients. Vascular entrapment of the lumbosacral plexus in different locations were first dissected then clipped (in 12 patients), coagulated and cut in all patients. Thrombosis of the external iliac artery occurred in one patient, postoperatively. In two patients pain persisted following operation and recurrence was observed in one patient.

Conclusion: Since lumbosacral plexus is located over the sacral bone, it can be entrapped easily by abnormal vessels crossing over the plexus. Radiating pain to lower limbs or genital area and also motor deficit of the lower limbs in patients with chronic pelvic pain were investigated in detail for the presence of vascular entrapment of the lumbosacral plexus. The minimally invasive surgery with three-dimensional vision provides improvement of the sensation of depth in the deepest parts of the pelvis and minimizes complications.

Prediction of Need for Morcellation during Total Laparoscopic Hysterectomy

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Study Objective: With all the concerns surrounding uterine morcellation, our objective was to identify predictors of the need for morcellation during total laparoscopic hysterectomy (TLH).

Design: A retrospective cohort study (Canadian Task Force classification II-2).

Setting: University Hospital Center.

Patients or Participants: Women undergoing a TLH for a benign gynecologic pathology form January 1st 2017 to January 31th 2019.

Interventions: All women underwent a TLH. If the uterus was to voluminous to be removed vaginally, surgeons favored in-bag morcellation by laparoscopy. Uterine weight (uterine length x maximum width x anteroposterior diameter x 0.52) and characteristics (number and volume of leiomyomas) were assessed prior to surgery by ultrasound or MRI in order to predict the need for morcellation.

Measurements and Main Results: A total of 252 women underwent a TLH during the two-year period. Women had a mean age of 46±7 (30–71) years old and the three main indications for surgery were abnormal uterine bleeding (77%), chronic pelvic pain (36%) and bulk symptoms (25%). Mean uterine weight was 325 (17-1572±272 grams, with 11/252 (4%) uterus being >1000 grams and 71% of women had at least one leiomyoma. Among women with a uterine weight >250 grams, 120 (95%) did not required morcellation. On the opposite, among women with a uterine weight >500 grams, 49 (100%) required morcellation. In addition to the estimated uterine weight (≥250 versus <250 grams; OR 2.91, CI 1.35-6.26, P<0.01), having ≥1 leiomyoma (OR 11.65, CI 2.97-45.73, P<0.01) and a leiomyoma ≥5 cm (OR 6.19, CI 2.86-13.39, P<0.01) were other significant predictors of uterine morcellation in multivariate logistic regression analysis. Total mean operative time for TLH without morcellation was 116 minutes and was of average 44 minutes longer with morcellation.

Conclusion: Uterine weight estimated by preoperative imaging as well as the size and number of leiomyomas are useful predictors of the need for morcellation.

Case Series: Minimally Invasive Management of Juvenile Cystic Adenomyoma

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Study Objective: To increase awareness of juvenile cystic adenomyoma (JCA) in patients with chronic pelvic pain.

Design: Retrospective case series.

Setting: Teaching hospital.

Patients or Participants: Three patients aged 16-30 years old presented with chronic pelvic pain (CPP) [2016 - 2019]. Hormonal treatment was attempted in two cases, but it failed. Cystic lesions in the myometrium (n=2), and the broad ligament (n=1) was detected on transvaginal 2D ultrasound (TV 2D US) and/or MRI. The cyst was separated from the endometrial cavity in all the cases. The cysts were within the myometrium of the posterior wall of the uterus, within the cornual region of the myometrium and within the broad ligament near the cornual region in the three cases respectively.

Interventions: Laparoscopic excision of the lesions.

Measurements and Main Results: The cystic lesions were confirmed on laparoscopy, and laparoscopic excision of the cysts with adequate repair of the myometrial beds were performed in all cases with fertility preservation (a video to be presented). Robotic assistance was chosen in one case as the cyst was in the broad ligament, for better visualization. The endometrial cavity was entered in one case (0.5cm). Pathology report confirmed the diagnosis of JCA is all cases. All three patients reported relief of their symptoms up to 6 to 8 months after surgery. No recurrence of the JCA was reported using TV 2D US in all cases.

Conclusion: JCA represents a rare focal form of adenomyosis that may affect young women. Large cystic lesions, as isolate entities within the uterus were reported to be rare; less than 1%. The exact mechanism is largely unknown. Our data suggest that minimally invasive surgery for excision of the cyst is the chosen approach of management. Our data also suggest symptomatic relief with no sonographic evidence of recurrence following surgery.
Minimally Invasive Hysterectomy for Endometriosis: Surgical Outcomes Based on Surgeon Specialty

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**Study Objective:** To examine differences in surgical outcomes of hysterectomy performed for endometriosis between general obstetricians and gynecologists (OB/GYNs) and gynecologic oncologists.

**Design:** Using the 2016 – 2018 American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) hysterectomy dataset, we examined 30-day complications in patients who underwent a hysterectomy for endometriosis between general OB/GYN and gynecologic oncology groups.

**Setting:** Health systems that participate in the ACS NSQIP nationally.

**Patients or Participants:** 4,506 patients who underwent hysterectomy for endometriosis.

**Interventions:** Hysterectomy for endometriosis.

**Measurements and Main Results:** From 2016 – 2018, a total of 4,506 hysterectomies were performed for the primary diagnosis of endometriosis. Compared to OB/GYNs, oncology patients were older (46.4±9.6 vs. 41.9±7.6), had a higher BMI (31.7±8.5 vs. 30.8±7.5) and a higher proportion of diabetes (8.3% vs. 5.4%) and hypertension (24.0% vs. 17.0%), were less likely smokers (13.3% vs. 19.0%), and included a higher proportion of non-Hispanic white patients (78.2% vs. 70.2%, all p<0.01). Compared to OB/GYNs, oncology patients included a higher proportion of American Society of Anesthesiologists class III (29.0% vs. 17.6%) patients, had less prior pelvic surgery (58.2% vs. 68.2%), and heavier uteri (193.3±232.3 vs. 158.±185.0, all p<0.01). Compared to oncologists, OB/GYNs performed a higher proportion of minimally invasive hysterectomies (MIH) (86.0% vs. 71.9%, p<0.01). There were no statistically significant differences in overall 30-day complications or mortality between oncologist and OB/GYN groups for MIH. Compared to OB/GYNs, oncologists had a longer operative time (134.7±65.4 vs. 129.2±60.9 minutes) and a higher rate of sepsis/shock (1.0% vs. 0.2%) for MIH (both p<0.05).

**Conclusion:** OB/GYNs were more likely to perform a hysterectomy for endometriosis in a minimally invasive fashion, however overall complications for minimally invasive hysterectomy were similar between groups and mortality was not affected. Differences in hysterectomy approach and individual complications may be due to patient selection for gynecologic oncologists.

Laparoscopic Access Device Injuries: An Analysis of 8 Years of Reports to the U.S. FDA

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**Study Objective:** To use population level data to describe adverse events associated with laparoscopic peritoneal entry and trocar placement.

**Design:** This is an observational study utilizing the Food and Drug Administration Manufacturer and User Facility Device Experience (FDA-MAUDE) database. We accessed publicly available adverse event reports from the FDA-MAUDE database from January 1, 2011 to December 31, 2018. Only events that took place during intraperitoneal surgery and associated with establishing intraperitoneal access or placement of trocars were included. Events were classified as device malfunction without patient harm, patient injury or patient death based on the narrative text provided.

**Setting:** N/A

**Patients or Participants:** N/A

**Interventions:** N/A

**Measurements and Main Results:** We reviewed 645 relevant adverse events. 132 of these were performed by gynecologic surgeons, 359 by general surgeons, 38 by urologists, and 114 surgeries could not be classified based on the information provided. 418 of the events were classified as a device malfunction, including broken balloon, trocar shaft or non-retracting blades. 191 reports described patient injury, including 99 vascular injuries and 81 visceral injuries. Most common vascular injuries were to the aorta, vena cava and iliac vessels. Bowel was the most common viscera injured. Other sources of patient injury included prolongation of OR time greater than 30 minutes specifically related to malfunctioning or broken instrumentation and retained fragments of broken instrumentation. 32 deaths were reported during the study period, most commonly related to penetrating vascular injury or visceral bowel injury complicated by post-operative sepsis. Most common vessels contributing to death were aorta, vena cava and inferior mesenteric artery.

**Conclusion:** The FDA-MAUDE database provides the best available information regarding the nature of adverse events that occur while establishing peritoneal access. Despite this, the data do not provide a complete picture and in many cases of mechanism of injury could not clearly be discerned. More rigorous data regarding complication rates is needed.

A Guide to Success: Tips and Tricks in Fundamentals of Laparoscopic Surgery (FLS)

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**Study Objective:** Compilation of tips and tricks to enhance successful completion of the manual skills component of the Fundamentals of Laparoscopic Surgery (FLS) exam.

**Design:** Video demonstration of tips and tricks of the five laparoscopic tasks for the FLS Program.

**Setting:** Community-based residency program.

**Patients or Participants:** PGY1 to PGY4 OB/Gyne residents.

**Interventions:** Video demonstration of several tips and tricks to proficiently complete the five FLS skills tasks.

**Measurements and Main Results:** Since the five FLS skills tasks are timed, this video will serve to improve the residents’ efficiency and time for completion.

**Conclusion:** This educational video enhances the residents’ procedural efficiency and skill development in laparoscopic techniques. Establishing an FLS program that includes a video on tips and tricks provides a useful, practical, and effective training tool for teaching laparoscopy.

Emergency in Fibroids - Acute Abdomen from Myoma Torsion

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**Study Objective:** To highlight the rare but possible gynecological emergency due to fibroids.

**Design:** Case report using narrated video, for operative technique in a gynecological emergency surgery where the access to the pelvic compartment was impaired by adhesions.

**Setting:** Under general anesthesia, in dorsolithotomy position, legs abducted. We used 3 punctures for the robotic arms and one for auxiliary laparoscopic arm and a uterine manipulator. The first auxiliar stands on the left and the second assistant on the manipulator.

**Patients or Participants:** A female, 30-years-old patient that arrived at the gynecology emergency room with acute abdominal pain. Referring a
previous diagnosis of pedicled fibroid in the posterior uterine wall. On physical exam she presented abdominal pain with signs of peritonitis, palpable mass on the posterior bottom of the vagina. Magnetic resonance: uterus 65cc, 3 myomas, one anterior intramural, 0.4 cm; other posterior subserous, 1.7 cm; the biggest one was subserous with vascular pedicle, occupying the bottom of posterior pelvic sac, 10.0 cm, with diffuse necrosis.

**Interventions:** We have opted to go to a robotic-assisted emergency exploratory laparoscopy.

Extensive adhesions lysis from all intestine to uterus and anexus, opening the blocked pelvis to access the rectum vaginal recess where we could find the detached myoma with signs of ischemia. Myomectomy of posterior subserous fibroids of 2cm. Specimen removal over protection from the bag, through abdominal Pfannenstiel incision for a faster approach. Hemostasis of the uterine posterior wall on fibroids pedicles.

**Measurements and Main Results:** Patient had no surgical complications, only mild pain on the first days and was discharged on the third postoperative day.

**Conclusion:** Exploratory robotic-assisted laparoscopy done on the emergency was possible due to patient stability, fast room turnover and great preparation by the nursing surgery team and the medical familiarity with the robotic platform.

**Radiofrequency Ablation of an 11cm Posterior Transmural Fibroid**

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**Study Objective:** To document through a case report and video, a successful Laparoscopic Radiofrequency Ablation (Lap RFA) treatment of an 11cm posterior transmural fibroid.

**Design:** Video Case Report, 8 months follow up.

**Setting:** Hospital OR, Straight Stick Laparoscopy with Laparoscopic Ultrasound and Guidance Mapping.

**Patients or Participants:** 29-year-old African American G0 with a one-year history of urinary frequency, urgency, heavy menstrual bleeding and anemia, recently requiring blood transfusion despite COCP’s. Preoperative ultrasound imaging showed a 13 × 11 × 9cm uterus with an 11 × 9 × 9cm posterior intramural fibroid. Patient was seeking a minimally invasive, uterine sparing alternative to a myomectomy.

**Interventions:** Laparoscopic Radiofrequency Ablation and surgical resection of endometriosis. July 2019, with treatment of one single posterior transmural fibroid, 10 separate radiofrequency ablations, totaling 32 minutes of total ablation time. EBL 30cc. No surgical or postoperative complications.

**Measurements and Main Results:** Patient reported subjective improvement in urinary frequency, urgency, heavy menstrual bleeding and anemia at 3 months and continued relief at 8 months post-op.

1. Uterus volume shrinkage by 47% by 4 months and remained at 8 months (1287cm³ to 687cm³).
2. Fibroid volume shrinkage by 72% by 4 months, and by 79% at 8 months (891cm³ to 185 cm³).

**Conclusion:** Laparoscopic Radiofrequency Ablation proved to be an effective treatment for fibroid larger than 9cm, in this case an 11 cm posterior intramural fibroid, and resulted in greater than 70% volume reduction and patient symptom relief by 4 months post-op.

**Active Versus Passive Discharge Voiding Protocols and Urinary Retention Rates after Same-Day Minimally Invasive Hysterectomy**

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**Study Objective:** The primary objective was to determine proportion of patients discharged with a urinary catheter after undergoing a same-day minimally invasive hysterectomy (MIH) for a benign gynecological condition according to active versus passive discharge voiding protocol. Secondary objectives included assessing post anesthesia care unit (PACU) duration and postoperative urinary retention (PUR) rate ≤2 weeks of discharge.

**Design:** Retrospective observational data-only cohort study.

**Setting:** A large integrated healthcare system serving over one-million reproductive-aged women annually.

**Patients or Participants:** Patients ≥18 years old, undergoing a same-day MIH for benign gynecological conditions without urogynecology procedures 2015-2018, were categorized into active or passive voiding trial groups. An active voiding trial was defined as a patient arriving in PACU with a catheter, retrograde filling the bladder with 300ml, then allowing for voiding ≥50% within 30 minutes. If unable to void this volume, then discharged with a catheter to be removed within 24 hours. A passive voiding trial involved filling or not filling the bladder prior to arriving in PACU without a catheter, then allowing for voiding or performing a straight catheterization in PACU if unable to void.

**Interventions:** N/A.

**Measurements and Main Results:** We found 1644 (83.2%) patients underwent passive voiding trials and 333 (16.8%) active voiding trials. Proportion of patients discharged with a catheter was lower in the passive voiding group than the active voiding group (5.4% versus 10.5%, P=0.001). Passive group had shorter mean PACU time than active group (218±86 versus 240±93 minutes, P<0.001). Crude PUR rates for the passive and active voiding groups were 1.8% and 3.0%, respectively (P=0.16).

**Conclusion:** Within a large integrated healthcare system, passive voiding trials were associated with a smaller proportion of patients discharged with a catheter, shorter PACU duration, and lower PUR rate. This suggests that passive voiding trials can be safely utilized after a benign MIH to reduce hospital duration, optimize healthcare resources, and ultimately improve patient experience.

**A Rare Case Report of Endometriosis with Complex Hyperplasia with Atypia Causing Complete Ureteral Obstruction and Non-Functional Kidney**

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**Study Objective:** The purpose of this case report is to highlight the existence for premalignant endometriotic lesions, and thus the possibility of malignant progression if left untreated.

**Design:** Case report including five years of significant patient history.

**Setting:** University affiliated hospital.

**Patients or Participants:** Our patient is a 48-year-old female status post total hysterectomy in 2015 for abnormal uterine bleeding and pelvic pain secondary to uterine fibroids. At the time of hysterectomy, she also underwent an excision of endometriosis, which was confirmed via pathology. Five years later she developed progressively worsening left flank pain, and subsequent imaging revealed a left ureteral mass. A MAG 3 lasix renal scan at that time revealed a non-functioning left kidney. Multiple renal biopsies at that time were consistent with endometriosis.

**Interventions:** Patient underwent laparoscopic-assisted left radical nephroureterectomy as well as excision of abdominal mass after referral to...
urologist. The urethral and abdominal wall mass pathology revealed endometriosis with simple and complex hyperplasia without atypia.

**Measurements and Main Results:** After the patient recovered, she returned to her minimally invasive endometriosis specialist and underwent a laparoscopic excision of deeply infiltrating endometriosis. She had widespread deep infiltrative fibrotic endometriosis including invasion into the psas muscle, rectosigmoid colon involvement. Pathology from this excisional surgery revealed endometriosis with complex hyperplasia with atypia (atypical endometriosis) from the region of the left pelvic brim. Additional specimens revealed simple hyperplasia without atypia.

**Conclusion:** The progression of endometriosis with atypical features on histology is not commonly cited in the literature. The majority of atypical endometriosis cases are found associated with ovarian cancer, which is typically quoted at having a one percent transformation potential. These extraneous findings of atypical endometriosis involving the pelvic peritoneum and retroperitoneal structures support the treatment modality of complete excision.

**Hysteroscopic Uterine Artery Laceration in Setting of Cervical Stenosis: A Case Study**

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**Study Objective:** To demonstrate a case report of hysteroscopic uterine artery laceration following false tract development in the setting of cervical stenosis, with associated hysteroscopic and laparoscopic findings.

**Design:** Case report study findings reported.

**Setting:** Single institution.

**Patients or Participants:** Single participant, de-identified.

**Interventions:** The treatment taken is described within the video series.

**Measurements and Main Results:** This video demonstrates the initial findings which led to the development of a false tract, with the subsequent laparoscopic findings of a broad ligament hematoma, and the subsequent uterine artery laceration which was identified and ligated.

**Conclusion:** Rare videos demonstrate complications associated with cervical stenosis, including hysteroscopic false passage creation. This video demonstrates this occurrence and the potentially disastrous complication of a uterine artery laceration as a result, with the management undertaken to repair the uterine artery and evacuate the resultant broad ligament hematoma. This case report may serve as a clinical guide.

**Transvaginal Natural Orifice Transluminal Endoscopic Surgery High Uterosacral Ligament Suspension (NOTES-HUS) for Apical Prolapse**

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**Study Objective:** To demonstrate practical tips and tricks for successful use of the transvaginal NOTES technique for preforming HUS.

**Design:** Stepwise demonstration with narrated video footage (Canadian Task Force classification III).

**Setting:** An academic tertiary care hospital.

**Patients or Participants:** A 58-year-old G2P2, NSVDx2 with Stage III anterior vaginal prolapse, Stage II uterine prolapse & posterior vaginal prolapse. The preoperative vaginal length was 7 cm.

**Interventions:** High uterosacral ligament suspension (HUS) is well accepted for apical prolapse due to its advantages of good apical support and simplification of intraperitoneal suture passage. Transvaginal natural orifice transluminal endoscopic surgery (NOTES) is a novel minimally invasive approach that avoids an abdominal incision while providing improved visualization, leading to simplified intraperitoneal suture placement. However, this approach may be technically challenging.

After performing transvaginal hysterectomy and anterior repair, the single-site port was placed, and BSO was subsequently performed. The following key techniques were utilized to perform NOTES-HUS:

- Tagging the sutures for bilateral uterosacral ligament before single-site port placement
- Identifying the ischial spine and ureters
- Pulling the tagged uterosacral ligament suture to assist in locating the high uterosacral ligament
- Grasping and lifting uterosacral ligament while placing a suture
- Giving the suture a tug after placement to confirm the correct location

**Measurements and Main Results:** The procedure was successfully performed in approximately 160 minutes with a postoperative vaginal length of 6 cm. Postoperative pelvic organ prolapse quantification was stage 0.

**Conclusion:** The transvaginal NOTES-HUS is a feasible and practical technique for apical vaginal prolapse. Applying the tips and tricks presented here, such as tagging uterosacral ligament before port placement, etc., the challenging transvaginal NOTES-HUS can be performed efficiently and safely.

**Examining the Effect of Utilizing a Surgical First Assist Versus Physician on Gynecologic Robotic Operative Variables**

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*Corresponding author.

**Study Objective:** To examine whether utilizing a salaried surgical first assistant or a physician as an assistant during gynecologic robotic cases affects surgical variables.

**Design:** Retrospective chart review.

**Setting:** Community Practice Setting in Las Vegas, Nevada.

**Patients or Participants:** Female patients undergoing robotic surgical intervention for any gynecologic reason from 2005-2018 by a single gynecologic oncologist (n=1,690).

**Interventions:** N/A

**Measurements and Main Results:** A high volume gynecologic oncologist’s robotic case data spanning fourteen years (2005-2018) was analyzed. We separated the cases based on the type of assistant used, either an employed surgical first assistant or another physician. The assisting physicians were either members of the same practice or general gynecologists in the community. The two groups were compared for operative time and estimated blood loss. We controlled for patient Body Mass Index, uterine weight, use of the fourth robotic arm, benign versus cancer pathology, and a subjective estimate of the difficulty of the case using a conventional laparoscopic versus robotic approach.

Cases with an employed surgical assist had a mean adjusted robotic console time that was 0.3hrs (19.2min) faster than cases with a physician as the assist (95% CI 0.26hrs to 0.37hrs faster, p<0.001). Cases with an employed surgical assist also had an EBL that was 47.5cc lower than cases with a physician assisting (95% CI 0.26hrs to 0.37hrs faster, p<0.001).

**Conclusion:** The use of an employed surgical assist was associated with a faster console time and lower blood loss compared to using an available physician even adjusting for confounding factors. This deserves further exploration, particularly in regards to complication rates, operating room efficiency, utilization of health care personnel, and cost.
Uterine Artery Embolization and Hysterectomy: An Interesting Case of Pelvic Congestion Syndrome and Uterine Arteriovenous Malformation

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Study Objective: The purpose of this video is to review a case of severe pelvic congestion and uterine arteriovenous malformations (AVMs) that was managed operatively with uterine artery embolization followed by immediate hysterectomy. Our objectives include:

- Review the risk factors, diagnosis, and treatment of uterine arteriovenous malformations.
- Describe the clinical course of a patient referred to our MIGS clinic for uterine artery embolization and hysterectomy.
- Consider postoperative expectations for a patient after embolization and hysterectomy for pelvic congestion syndrome and AVMs.

Design: This is a case report.

Setting: Interventional radiology operating room and robotic operating room.

Patients or Participants: A 56-year-old postmenopausal woman with a 2 cm friable mass seen on posterior lip of cervix. On biopsy, it was proved to be squamous cell carcinoma. On imaging, a hyper intense mass was seen limited to cervix, flushing the vagina with bleeding in touch. A thorough comprehension of pelvic anatomy helps in optimum tumor clearance. Any suspicion of distant metastasis us a contra-indication.

Interventions: Radical hysterectomy and robotic-assisted total laparoscopic hysterectomy.

Measurements and Main Results: N/A

Conclusion: Our case report emphasizes that uterine artery embolization before hysterectomy can help decrease blood loss for severe pelvic congestion syndrome and known AVMs. To achieve these favorable outcomes, coordination with interventional radiology, anesthesia, and the OR staff is necessary. Postoperatively, patients may have a fever due to the known pelvic congestion. These postoperative changes may present similarly to a pelvic abscess, but our patient was successfully managed expectantly.

Robotic Radical Hysterectomy

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Study Objective: This video is a demonstration of Radical Hysterectomy done robotically.

Design: Case report.

Setting: Patient was put in semi-lithotomy position.

Patients or Participants: A 56 years old post menopausal woman with parity 4, Live birth 4, all being vaginal delivery underwent examination due to excessive vagina discharge. On examination, 2 × 2 cm friable mass was seen on posterior lip of cervix. On biopsy, it was proved to be squamous cell carcinoma. On imaging, a hyper intense mass was seen limited to cervix.

Interventions: Radical hysterectomy is considered the standard treatment for patients with early-stage cervical cancer. Understanding the anatomy of parametrium and para cervix along with meticulous dissection are the key factors for optimal Tumor clearance.

Measurements and Main Results: The operative time was 120 minutes and the blood loss was 40 ml. Post operative course was uneventful and the patient was discharged after three days.

Conclusion: Minimally invasive surgery especially Robotic surgery is a better and safe option for surgical treatment of cancer cervix.

Robotic TOTAL Pelvic Exenteration for Primary Carcinoma of Cervix, STAGE IV a

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Study Objective: This video is a demonstration of total pelvic exenteration done by robotic technique in a case of a primary cervical cancer at stage IV A.

Design: CaseReport.

Setting: Semi-lithotomy position.

Patients or Participants: A 75-year old female complained of postmenopausal bleeding per vagina, abdominal pain and constellation. In per speculum and on per vaginum examination, a circumferential growth was noted on the cervix, flushing the vagina with bleeding in touch. In per rectal examination, the growth was palpable and found to be extending to anterior rectal wall and lateral parametrium [stage IV A]. The cervical biopsy was suggestive of moderately differentiated squamous cell carcinoma.

Interventions: Total pelvic exenteration is a radical procedure which involves EN bloc resection of uterus, cervix, vagina, urinary bladder and rectosigmoid. It has been performed for primary and recurrent cervical cancer resulting in favourable outcomes. A thorough comprehension of pelvic anatomy helps in optimum tumor clearance. Any suspicion of distant metastasis us a contra-indication.

Measurements and Main Results: Following the surgery, a diversion ileostomy and cutaneous ureterostomy is created to drain the fecal matter and urine respectively to the exterior into a bag.

Conclusion: Robotic Total Pelvic Exenteration can be performed successfully in advanced cervical cancer.

Quality of Life Outcomes in Treatments for Symptomatic Uterine Fibroids: A Systematic Literature Review

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Study Objective: To conduct systematic literature review (SLR) on quality of life (QoL) outcomes of treatments for symptomatic uterine fibroids (UF).

Design: A systematic review was conducted using MEDLINE, Embase, PubMed and Google Scholar to identify studies published since database inception and May 1, 2020. Prospective and retrospective studies with at least ten patients were considered eligible if they included treatment of symptomatic UF patients and reported QoL measures using the uterine fibroid symptom quality of life (UFS-QoL) questionnaire. The baseline, post baseline and change from baseline (CFB) UFS-QoL scores for overall and subscales were extracted for each time point reported in the study.

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: Of 746 search results, 64 references for 60 studies were included: 42 prospective studies, 9 retrospective studies, 3 post hoc analyses and 6 other studies. A total of 8,047 patients were included, with a median study size of 66 patients. The baseline and...
post-baseline median health-related quality of life (HRQoL) scores were 46.6 and 82.0, respectively (Mean scores were 49.8 and 82.4 respectively). The median improvement in HRQoL score was 34.2 (Mean 31.8, N=7,261 pts). The baseline and post-baseline median symptom severity scores (SSS) were 55.9 and 22.3, respectively (Mean scores were 54.0 and 21.3 respectively). The median improvement in SSS was -32.6 (Mean -31.7, N=7,380 patients). Similar range of improvements were observed for other subscales of UFS-QoL.

**Conclusion:** To our knowledge, this study is one of the first and the most comprehensive systematic review on quality of life outcomes of treatments for symptomatic UF patients. An on-going meta-analysis is warranted to provide a more quantitative overview of QoL outcomes.

**Using Video to Improve Understanding of Anatomy for Clinical Medical Students**

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*Corresponding author.

**Study Objective:** Surgical videos allow students to observe cases prior to entering the operating room, thereby improving the intra-operative learning experience for both the student and the educator. Minimally invasive surgery is especially suited to this modality of teaching. We created an interactive video series that allows students to better understand the elements of common gynecologic procedures, including laparoscopic salpingectomy-oophorectomy.

**Design:** This video on laparoscopic salpingectomy-oophorectomy was created as part of a 4-part series demonstrating common gynecologic procedures. The video reviews the indications for the procedure, basic tools used, port-site placement, and surgical footage of the laparoscopic entry, surveillance, peritoneal lavage, and removal of the ovary and fallopian tube to help students become more familiar with the different elements of the case.

**Setting:** The video was produced by the UCSF Educational Department to be used by third-year medical students during their OB-GYN rotation at an academic teaching hospital.

**Patients or Participants:** Videos were created for clinical medical students and narrated by senior medical students.

**Interventions:** The videos were shared on the OB-GYN rotation website. Following completion of the video, students were asked to complete a short anonymous survey about the effectiveness of the videos.

**Measurements and Main Results:** Of the 29 students who participated in the survey, 27 (93.1%) felt that they were significantly or somewhat more prepared to participate in the operating room after watching these videos compared to prior. Students found that the videos were either extremely or very useful for learning gynecologic anatomy (n=23, 79.3%) or learning the steps of surgical procedures (n=24, 82.8%), and 23 students (79.3%) were extremely or very willing to recommend these videos to their classmates.

**Conclusion:** Surgical film for medical students can improve the understanding and comfort in the operating during clinical rotations and enhance the clinical clerkship experience.

**Partial Resectoscopic Endometrial Ablation As a Viable Alternative to Global Ablation: A Case Series and Demonstration**

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**Study Objective:** In the past decade, recognition of late onset endometrial ablation failures - generally resulting from intra-uterine scarring around residual or recovered endometrium - has increased interest in alternative treatments for heavy menstrual bleeding, such as partial ablation. This video presents the history of this uncommon procedure, a case series, and a demonstration of our preferred technique.

**Design:** This retrospective case series illustrates operative indications and limited outcomes with an average of 1.4 years of follow-up. The surgical video demonstrates principles for a safe and effective procedure.

**Setting:** Minimally invasive gynecologic sub-specialty group within a suburban community teaching hospital system.

**Patients or Participants:** From 2010-2019, 11 of 132 (8%) patients identified by billing procedure codes met inclusion criteria that a partial endometrial ablation was performed for heavy menstrual bleeding.

**Interventions:** A 9mm bipolar resectoscope was used to remove 50-65% of the endometrium and superficial myometrium (at least 4mm depth), including the anterior or posterior surface and the lateral walls. Any concomitant focal pathology was also removed.

**Measurements and Main Results:** Seven of 11 patients were 45 years old or younger. All patients declined or failed hormonal therapies and declined hysterectomy. Operative time averaged 45 minutes. There were no intraoperative or postoperative complications. Of 9 patients with at least 1 year of follow-up, 6 reported eumenorrhea. Ultimately 3 of 11 patients underwent or desired hysterectomy to date.

**Conclusion:** This video reviews the limited literature and one center’s experience with partial resectoscopic endometrial ablation as an alternative to global ablation and includes a demonstration of proper technique.

**Reliability and Validity of Two Surgical Prioritization Systems for Non-Emergent Gynecologic Surgery during the COVID Pandemic**


*Corresponding author.

**Study Objective:** Scientifically evaluate the validity and reproducibility of two novel surgical triaging systems, as well as offer modifications to the MeNTS criteria for improved application in gynecologic surgeries.

**Design:** Retrospective cohort study.

**Setting:** Academic university hospital.

**Patients or Participants:** 97 patients with delayed benign gynecologic procedures due to the COVID pandemic.

**Interventions:** Surgical prioritization was assessed using two novel scoring systems, the Gyn-MeNTS and mESAS systems for all 93 patients included.

**Measurements and Main Results:** The inter-rater reliability and validity of 2 novel surgical prioritization systems (Gyn-MeNTS and mESAS) were assessed. Gyn-MeNTS scores were calculated by 3 raters and analyzed as continuous variables, with a lower score indicating more urgency/priority. The mESAS score was calculated by 2 raters and analyzed as a 3-level ordinal variable with a higher score indicating more urgency/priority. All 5 raters were blinded to reduce bias. Gyn-MeNTS inter-rater reliability was tested using Spearman r and paired t-tests were used to detect systematic differences between raters. Weighted kappa indicated mESAS reliability. Concurrent validity with mESAS and surgeon self-prioritization (SSP) was examined with Spearman r and logistic regression. Spearman r’s for all Gyn-MeNTS rater pairs were above 0.80 (0.84 for 1 vs. 2, 0.82 for 1 vs. 3, 0.82 for 2 vs. 3, all p<0.0001) indicating strong agreement. The weighted kappa for the 2 MeESAS raters was 0.57 (95% CI 0.40-0.73) indicating moderate agreement. When used together, both scores were significantly independently associated with SSP, with strong discrimination (AUC 0.89).

**Conclusion:** Inter-rater reliability is acceptable for both scoring systems, and concurrent validity of each is moderate for predicting SSP, but discrimination improves to a high level when they are used together.

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**Conclusion:** Inter-rater reliability is acceptable for both scoring systems, and concurrent validity of each is moderate for predicting SSP, but discrimination improves to a high level when they are used together.
Endometrial Sampling for Preoperative Diagnosis of Uterine Leiomyosarcoma

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Study Objective: Preoperative detection of uterine leiomyosarcoma is important in hysterectomies performed for presumed benign indications. This study examined the effectiveness of endometrial sampling for preoperative diagnosis of leiomyosarcoma and the factors associated with a false negative.

Design: This is a retrospective analysis of linked data from the New York Statewide Planning and Research Cooperative System and the New York State Cancer Registry. Using procedure codes, we identified women who underwent preoperative endometrial sampling and hysterectomy in 2003-2015. We further limited the sample to women who had a subsequent diagnosis of uterine leiomyosarcoma based on histology, site and behavioral codes. We estimated the proportion of patients whose leiomyosarcoma was diagnosed preoperatively, and compared their characteristics with patients whose leiomyosarcoma was missed preoperatively (i.e., diagnosed postoperatively) using chi-square/Fisher’s exact test and Wilcoxon rank sum test.

Setting: Inpatient and outpatient encounters at civilian hospitals and ambulatory surgery centers in New York state.

Patients or Participants: 79 adult women with leiomyosarcoma who underwent endometrial sampling (biopsy or dilation and curettage) within 90 days before hysterectomy.

Interventions: N/A

Measurements and Main Results: Among the 79 patients with leiomyosarcoma, 46 (58.2%) were diagnosed preoperatively, whereas 33 (41.8%) were diagnosed postoperatively. Patients diagnosed postoperatively did not differ significantly from those diagnosed preoperatively in cancer stage, grade, age, bleeding symptoms, or comorbidities. However, tumor size was larger among patients who were diagnosed postoperatively than those diagnosed preoperatively (median=12 versus 9 centimeters, p=0.04). The rate of preoperative diagnosis was higher among patients who underwent sampling with hysteroscopic guidance (66.7%) than sampling without hysteroscopic guidance (31.6%) (p=0.007). Among patients diagnosed postoperatively, 21.2% underwent a supracervical hysterectomy, compared to 0% among those diagnosed preoperatively (p=0.002).

Conclusion: Endometrial sampling was instrumental in diagnosing approximately half of uterine leiomyosarcomas preoperatively, which was more commonly achieved with hysteroscopic guidance.

Comparison of Differences in Patient Outcomes for Surgeries Performed By Fellowship-Trained Gynecologists Compared to Generalists

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*Corresponding author.

Study Objective: To compare patient characteristics and surgical outcomes for surgeries performed by fellowship-trained gynecologic surgeons (MIGS) to OB/GYNs without additional training (Generalists).

Design: Literature review using PubMed/Medline.

Setting: Academic university and community hospitals.

Patients or Participants: Eight retrospective cohort studies including total of 8,888 patients undergoing minimally invasive surgery by MIGS and Generalists

Interventions: Compare patient BMI, uterine weight, and prior surgical history; evaluate difference in surgical complexity, operative times, blood loss, length of hospital stay, occurrence of complications, hospital costs.

Measurements and Main Results: Majority of studies included benign hysterectomies performed over an average of 3.75 years (range 1-9 years). Fellowship training included MIGS; only one study included gynecologic-oncologists and urogynecologists.

Compared to Generalists, MIGS operated on patients with higher BMI (OR 2.030 for BMI 40+), greater uterine weight (649.9 g v. 320.7 g, p<0.01), and a history of prior abdominal surgeries (42.7% vs 17.2%; p<0.001).

MIGS performed more difficult procedures related to resection of endometriosis (22.9% vs. 4.4%, p<0.001), uterine prolapse (27.2% vs. 3.2%, p<0.001) and lysis of adhesions (82.1% vs. 8.9%, p<0.001).

MIGS had significantly shorter operative times, lower blood loss during surgery, and decreased length of stay after surgery. Patient and hospital charges were lower for surgeries performed by MIGS (patient cost: $28,063 vs. $36,612, p < .0001; hospital cost: $6612 vs. $7680, p < .0001).

Majority of the studies show a decrease or no difference in rate of total, postoperative or intraoperative complications with MIGS.

Conclusion: MIGS fellowship training is associated with improved perioperative outcomes, despite the increase in surgical complexity. This finding indicates that surgical volume is not the only determinant of outcomes. Unlike other surgical residencies, this higher level of technical ability is not consistently obtained in the current structure of OB-GYN residency, underlining the importance of additional training, which ultimately may be required for those who wish to practice gynecologic surgery in the future.

A Novel Low-Fidelity Model for Laparoscopic Hysterectomy Simulation

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Study Objective: To develop a novel, low-fidelity laparoscopic hysterectomy (LH) simulation model for use in gynecologic surgical training.

Design: Simulation study.

Setting: Academic medical center.

Patients or Participants: Obstetricians and gynecology trainees and attending gynecologic surgeons.

Interventions: A simulation model was constructed using low-cost materials to represent the uterus and pertinent anatomic structures. The model was affixed to a VCare uterine manipulator and paired with a laparoscopic trainer box. Obstetrics and gynecology trainees and attending gynecologic surgeons performed a simulated LH. Pre-procedure and post-procedure questionnaires were administered to assess confidence in LH, face validity of the simulation model, and utility of the model for improving and teaching surgical skills required for LH.

Measurements and Main Results: Eleven residents, 3 fellows and 10 attending gynecologic surgeons participated in the study. Of the 11 residents, 6 (54.55%) were PGY 1-2 and 5 (45.45%) were PGY 3-4. Prior to completion of the hysterectomy simulation, 15.38% and 30.77% of trainees were very confident and confident, 15.38% were neither confident nor not confident, 7.69% were not confident, and 30.77% were very not confident in performing LH independently. The majority of respondents (75.00%) agreed that the model provided a realistic simulation of a LH.
Ten respondents (41.67%) strongly agreed and 14 (58.33%) agreed that the model was an effective tool for improving surgical skills required for LH. Fourteen respondents (58.33%) strongly agreed and 10 (41.67%) agreed that the model was an effective tool for teaching LH. Ten respondents (41.67%) strongly agreed and 9 (37.50%) agreed that the model was a useful tool for assessing a learner’s ability prior to the operating room.

Conclusion: This low-fidelity model provides realistic simulation for laparoscopic hysterectomy and is a useful tool for procedural skills acquisition and teaching.

12-Month Follow-up of a Novel, Meshless Method of Vaginal Colpopexy By Sacrosinous Ligament Fixation to Treat Pelvic Organ Prolapse

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12Female Pelvic Health Center, Newton, PA; 13Director - National Center for Advanced Pelvic Surgery, Medstar Washington Hospital Center, Washington, DC

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Study Objective: To assess safety and durability of EnPlace (formerly, NeuGuide) for vaginal colpopexy to treat uterine prolapse.

Design: Prospective, observational, single arm, multi-center study with 12-month follow-up.

Setting: Academic centers and community hospitals.

Patients or Participants: Sixty-seven women > 35 years of age with symptomatic pelvic organ prolapse (POP) were enrolled from 13 (global) sites.

Interventions: EnPlace anchors were inserted bilaterally, transvaginally at the apex and deployed through the sacrosinous ligament under anesthesia. Two (pre-attached) sutures extend from the anchors and were tunneled behind the vagina and exited through a para-cervical incision. The bilateral suture tails were passed through cervical stroma and tied to reduce the cervix to a normal position and suspend the uterus.

Measurements and Main Results: All the women were post-menopausal (average age=69.4 ± 8.6 years), and all complained of vaginal bulging. Fifty patients completed 6-month follow-up, and 22 completed 12-month follow-up. Anterior and posterior average pre-op Ba, Bp and C POP-Q scores were +0.09 cm, -1.0 cm and +0.98 cm, respectively. At 6- and 12-month post-op, avg Bp and C point POP-Q scores were significantly more negative than baseline (p<0.02 for both comparisons). The average C point was -4.6 cm at 6 months (n=50) and -4.52 at 12 months (n=22). Prolapse symptoms recurred by 6 months in 10 of 67 patients (15%), 5 of whom elected further surgery within less than a year. There were 14 additional adverse or serious adverse events; 3 were device-related; and all self-limited.

Conclusion: The EnPlace System is feasible and safe as a minimally invasive procedure for the treatment of uterine prolapse. The preliminary results of this cohort of patients demonstrate that the procedure is effective for the treatment of uterine prolapse. There was no significant change in the C point between 6 and 12 months, suggesting that the EnPlace repair is durable, though further follow-up is necessary to establish long term durability.

Current Trends in Surgical Outcomes of Hysterectomy for Endometriosis

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Study Objective: To evaluate current surgical outcomes of hysterectomy for endometriosis performed by general obstetricians and gynecologists (OB/GYNs).

Design: Using the 2016 – 2018 American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) hysterectomy dataset, we examined surgical outcomes including route of hysterectomy and 30-day complications in patients who underwent a hysterectomy for endometriosis by OB/GYNs.

Setting: National health systems that participate in NSQIP.

Patients or Participants: 3,641 patients who underwent hysterectomy for endometriosis.

Interventions: Hysterectomy for endometriosis.

Measurements and Main Results: From 2016 – 2018, 3,641 hysterectomies were performed by OB/GYNs for the primary diagnosis of endometriosis. 86.0% were performed via a minimally invasive approach (MIIH), 2,882 (79.2%) laparoscopically and 247 (6.8%) vaginally. Mean patient age was 41.9±7.6, mean body mass index was 30.8±7.5, and patients were 70.2% non-Hispanic white, 9.8% African American, and 9.6% Hispanic. The majority (69.3%) were American Society of Anesthesiologists class II (class I 12.4%, class III 17.6%). The majority had >1 comorbid condition (64.7%), most commonly obesity (47.7%), smoker (19.0%), and hypertension (17.0%). Most patients had prior pelvic (68.2%) or abdominal (30.8%) surgery. Open hysterectomy patients included a higher proportion of African American (14.3% vs. 9.1%) and a lower proportion of non-Hispanic white (52.0% vs. 73.2%) patients, had heavier uteri (226.9±350.4 vs. 147.2±138.4), lower parity (1.6±1.4 vs. 1.9±1.4, all p<0.001), and were more likely obese (52.5% vs. 46.9%, p=0.02). The overall complication rate was 9.8%. Compared to open approaches, MIH had a lower rate of overall complications (8.5% vs. 17.8%) including wound (2.7% vs. 7.2%) and major (4.4% vs. 8.8%) complications (all p<0.001). MIH had shorter operative time (129.2±60.9 vs. 143.8±71.9), shorter length of stay (0.9±1.6 vs. 2.4±1.8), and fewer readmissions (2.8% vs. 5.5%, all p<0.001).

Conclusion: While hysterectomy for endometriosis is a challenging procedure to perform, OB/GYNs are performing this procedure predominantly via a minimally invasive approach with few complications and favorable outcomes.

Prevalence of and Risk Factors for Emergency Department Visits Following Outpatient Gynecologic Surgery

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Study Objective: To evaluate current surgical outcomes of hysterectomy for endometriosis performed by general obstetricians and gynecologists (OB/GYNs).

Design: Using the 2016 – 2018 American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) hysterectomy dataset, we examined surgical outcomes including route of hysterectomy and 30-day complications in patients who underwent a hysterectomy for endometriosis by OB/GYNs.

Setting: National health systems that participate in NSQIP.

Patients or Participants: 3,641 patients who underwent hysterectomy for endometriosis.

Interventions: Hysterectomy for endometriosis.

Measurements and Main Results: From 2016 – 2018, 3,641 hysterectomies were performed by OB/GYNs for the primary diagnosis of endometriosis. 86.0% were performed via a minimally invasive approach (MIIH), 2,882 (79.2%) laparoscopically and 247 (6.8%) vaginally. Mean patient age was 41.9±7.6, mean body mass index was 30.8±7.5, and patients were 70.2% non-Hispanic white, 9.8% African American, and 9.6% Hispanic. The majority (69.3%) were American Society of Anesthesiologists class II (class I 12.4%, class III 17.6%). The majority had >1 comorbid condition (64.7%), most commonly obesity (47.7%), smoker (19.0%), and hypertension (17.0%). Most patients had prior pelvic (68.2%) or abdominal (30.8%) surgery. Open hysterectomy patients included a higher proportion of African American (14.3% vs. 9.1%) and a lower proportion of non-Hispanic white (52.0% vs. 73.2%) patients, had heavier uteri (226.9±350.4 vs. 147.2±138.4), lower parity (1.6±1.4 vs. 1.9±1.4, all p<0.001), and were more likely obese (52.5% vs. 46.9%, p=0.02). The overall complication rate was 9.8%. Compared to open approaches, MIH had a lower rate of overall complications (8.5% vs. 17.8%) including wound (2.7% vs. 7.2%) and major (4.4% vs. 8.8%) complications (all p<0.001). MIH had shorter operative time (129.2±60.9 vs. 143.8±71.9), shorter length of stay (0.9±1.6 vs. 2.4±1.8), and fewer readmissions (2.8% vs. 5.5%, all p<0.001).

Conclusion: While hysterectomy for endometriosis is a challenging procedure to perform, OB/GYNs are performing this procedure predominantly via a minimally invasive approach with few complications and favorable outcomes.
Patients or Participants: Women (n=2,373) age 18 and older who underwent scheduled outpatient gynecologic surgery for a benign indication between November 2017 and September 2019.

Interventions: Any gynecologic surgery performed for benign indications.

Measurements and Main Results: We extracted demographic, clinical, and perioperative characteristics from the medical record. The primary outcome was evaluation at our institution’s ED within 30 days of surgery. Patients who visited the ED, as compared to those who did not, were younger (median age 37 vs. 42, p<.02) and were more likely to have a history of abdominal surgery (67% vs. 56%, p=.02) or cardiopulmonary comorbidity (53% vs. 40%, p=.007). Additionally, patients who underwent intraperitoneal fistula repair as opposed to vulvovaginal surgery (50% vs. 44%, p=.04) or who experienced a postoperative complication (9% vs 4%, p=.005) were more likely to visit the ED.

A total of 109 (5%) patients visited our institution’s emergency room 125 times within thirty days of surgery. Forty-five (36%) ED visits resulted in admission. When adjusted for ASA class, chronic pain comorbidities, procedure performed, operative time, blood loss, and attendance at a postoperative clinic visit, the following factors were associated with significantly increased or decreased odds of visiting the emergency room in multivariate analysis: increasing age (aOR 0.5; 95% CI 0.3-0.7), cardiopulmonary comorbidities (aOR 1.9; 95% CI 1.2-3.0), and undergoing prolapse surgery as opposed to other non-hysterectomy vulvovaginal procedures (aOR 0.2; 95% CI 0.1-0.6).

Conclusion: Emergency department visits were uncommon after outpatient gynecologic surgery but approximately one third resulted in admission. Increased counseling of younger patients and optimization of cardiopulmonary comorbidities may help reduce this burden.

Management of a Utero-Paravaginal Fistula: A Case Report
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Study Objective: We present the case of a utero-paravaginal fistula noted in a patient with primary infertility and a history of a bicornuate uterus who had previously undergone multiple gynecologic surgical procedures.

Design: Case report.

Setting: A tertiary care center.

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: A 28 y/o G0 with primary infertility associated with a bicornuate uterus presented to our office for evaluation after obtaining an ultrasound and MRI which showed a normal left hemiuterus but a right cystic pelvic mass consistent with a distended uterine horn with extensive blood within it. She had previously undergone several surgical procedures in Brazil, one of which was labeled a Strassman procedure. She was taken to the OR for hysteroscopy and laparoscopy where hysteroscopy revealed a small uterine septum but otherwise normal appearing endometrial cavity and laparoscopy revealed a normal appearing uterus and endometriosis that was resected. She subsequently developed a pelvic abscess in what appeared to be the lower uterine segment suggestive of an isthmocele. Pelvic abscess was drained, and subsequently CT hysterosalpingogram was performed which revealed a utero-paravaginal fistula. Three months after her infection, she returned to the OR for utero-paravaginal fistula repair. Postoperatively she did well and sonohystogram performed 3 months post-operatively has shown no residual defect.

Conclusion: This is the only case in the literature we could find where this type of utero-paravaginal fistula is described. Given her extensive surgical history, it is likely this is a result of previous surgical intervention. We highlight the use of CT hysterosalpingogram to document the nature of the fistula and aid us in subsequent repair.

Chronic Pelvic Pain in Women with a History of Essure Placement: A Systematic Review of Differential Diagnosis and Management Options
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Study Objective: The purpose of this article is to provide an evidence based review of management options for patients with pelvic pain and an in situ Essure device.

Design: Literature review and qualitative analysis.

Setting: N/A

Patients or Participants: N/A

Interventions: N/A

Measurements and Main Results: The Essure device was voluntarily withdrawn from the market in 2018 by the manufacturer due in part to concerns about post placement adverse events and an FDA black box warning about uterine and fallopian tube perforation, suspected allergic or hyper-sensitivity reaction, and need for surgical removal for adverse events which were mostly related to pain. We performed a PubMed keyword literature search, as well as directed searches of Obstetrics & Gynecology, American Journal of Obstetrics and Gynecology, and Journal of Minimally Invasive Gynecology. A total of 43 publications were included, and consisted of 7 prospective studies, 15 retrospective studies, 18 case series, 2 review articles, and one summary article by the FDA.

Conclusion: A brief summary of recommendations and conclusions from this review:

- Initial work up of pain in a patient with Essure devices should begin with placement confirmation via either transvaginal ultrasound or hysterosalpingogram/Xray.
- In the event Essure microinserts are malpositioned, device removal is recommended.
- In patients with a history and physical exam suggestive of possible endometriosis or adenomyosis, consider an attempt at hormonal management prior to surgical excision of the Essure device.
- We recommend a laparoscopic resection of the fallopian tubes with or without partial cornuectomy for the management of pelvic pain of and no other identifiable source, even if Essure device is positioned appropriately.
- We recommend an imaging modality be available in the OR during device removal to confirm an intact device and/or complete resection.
- If hysterectomy is planned for in patients with the Essure device for indications other than pelvic pain, we recommend en block resection of the fallopian tubes and cornu.

Impact of Overnight Formal Ultrasound on the Diagnosis of Ectopic Pregnancy (EP) Among Symptomatic Pregnancies of Unknown Location (PUL)
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**Study Objective:** To assess changes in performance characteristics of the initial diagnoses established during a gynecologic consult for PUL after implementation of overnight formal ultrasound.

**Design:** This retrospective cohort study compares pre-intervention (2017) and post-intervention (2019) periods in a convenience sample.

**Setting:** Urban academic tertiary-care hospital, single institution.

**Patients or Participants:** Reproductive-aged women were included if they underwent a gynecologic consult for symptomatic PUL in the Emergency Department during after-hours (18:00-08:00). A total of 325 of 810 (40%) screened patients met inclusion criteria. For primary outcome analysis, 97 of 147 (66%) patients in 2017 and 111 of 178 (63%) patients in 2019 completed follow-up to final diagnosis.

**Interventions:** Overnight formal ultrasound was implemented Monday through Friday night in 2018 and was performed before or during a gynecologic consult.

**Measurements and Main Results:** Primary outcomes were gynecologic consult performance characteristics (eg, sensitivity, specificity, and predictive values). Quality measures relevant to early diagnosis of EP were also investigated. Descriptive statistics and significance were calculated using T-Test, Fisher’s Exact, or Chi-square where appropriate (alpha=0.05). Fewer patients at the initial consult were discharged with a diagnosis of PUL, from 55% in 2017 to 30% in 2019, p=0.0002. Accurate initial diagnosis of EP increased from 52% to 76% of all EP, p=0.046. Positive predictive value for initial EP diagnosis improved from 79% to 97%, p=0.047. Populations were similar in baseline characteristics, admission dictive value for initial EP diagnosis improved from 79% to 97%, p=0.047. Populations were similar in baseline characteristics, admission

**Conclusion:** Overnight formal ultrasound increased accurate diagnosis of EP at the initial consult. Ongoing quality assessment should be considered for emergency gynecologic care.

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**Gynecologic Pathology Presenting As Urologic Symptoms: A Lesson on Pelvic Nerves**

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**Study Objective:** Patients with underlying gynecologic pathology often present with a combination of seemingly unrelated and non-specific complaints such as pelvic pain, urinary frequency, urgency, and gastrointestinal symptoms. Thus, patients are often misdiagnosed and mismanaged. A thorough understanding of pelvic nerve anatomy is important in properly diagnosing and treating these patients.

**Design:** N/A

**Setting:** N/A

**Patients or Participants:** This video will highlight two patient cases which demonstrate how gynecologic pathology can present as urologic symptoms secondary to disease involvement of certain pelvic nerves. The first patient is a 32 year old female who struggled with urinary frequency, urgency, nocturia, and pelvic pain; all of which were secondary to endometriotic implants overlying the hypogastric nerve. The second patient is a 31 year old female who also presented with urinary urgency, nocturia, and pelvic pain which was secondary to a large broad ligament fibroid impinging the hypogastric nerve and causing mass effect on her bladder.

**Interventions:** The first patient underwent robotic assisted laparoscopic excision of endometriotic tissue. The second patient underwent robotic assisted laparoscopic myomectomy.

**Measurements and Main Results:** Each of these patients had pathology either directly compressing the pelvic nerves or causing chemical irritation to the nerves. Postoperatively, after removal of endometrial implants resulting in decreased nerve irritation, the first patient’s pain and urinary symptoms improved. Likewise, in the second patient, when the fibroid was removed the compression of the surrounding pelvic nerves and bladder were relieved and the patients, symptoms subsequently resolved.

**Conclusion:** Understanding pelvic nerve anatomy is important in properly diagnosing and managing patients who do not present with conventional gynecologic symptoms. It is important to remember that with structural and biochemical irritation of these nerves, gynecologic pathology can present as urologic or even gastrointestinal symptoms. Proper diagnosis saves the patient from unnecessary testing and ineffective treatments.

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**Modified Ubess and CA-125 Endometriosis Severity Prediction Model Protocol**

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**Study Objective:** The Ultrasound-Based Endometriosis Staging System (UBESS) has demonstrated accuracy in predicting the laparoscopic skill required for maximum cytoreductive endometriosis surgery. However, UBESS does not account for the need for ureterolysis, an advanced laparoscopic skill, nor does it differentiate between isolated peritoneal disease and no disease. The Modified-UBESS and Ca-125 endometriosis severity prediction model aims to account for these short-falls by incorporating ultrasound (ovarian fixation, endometrioma, uterosacral endometriosis) and biochemical (Ca-125) markers to improve the prediction of intraoperative ureterolysis and isolated peritoneal disease, thereby improving the UBESS accuracy in predicting surgical complexity.

**Design:** This prospective study assesses the diagnostic accuracy of the endometriosis severity prediction model in predicting the ASRM endometriosis stage (American Society of Reproductive Medicine) and AGES laparoscopic skill (Australasian Gynaecological Endoscopy & Surgery) required for maximum cytoreductive surgery for women with suspected endometriosis undergoing laparoscopic surgery at Liverpool, Campbelltown and Nepean Hospital over a 5-year period.

**Setting:** N/A

**Patients or Participants:** 200 women of reproductive age with suspected endometriosis (chronic pelvic pain and/or infertility) will be recruited.

**Interventions:** Participants will undergo a standardised history and Ca-125, followed by a 5 domain TVUS (transvaginal ultrasound) by an expert sonologist. Women will be assigned a modified UBESS score, which incorporates the likelihood of requiring ureterolysis. All women will undergo laparoscopic surgery within 6 months of their TVUS and Ca-125, with ASRM stage and AGES skill recorded.

**Measurements and Main Results:** The diagnostic accuracy of our model in predicting the ASRM stage and AGES skill required for maximum cytoreductive surgery will be calculated.

**Conclusion:** If this study demonstrates that our model is effective in pre-operatively predicting the ASRM stage and AGES skill required for maximum cytoreductive endometriosis surgery, after external validation, it can be implemented worldwide to reduce the risks and health care costs associated with multiple laparoscopic surgeries for women with suspected endometriosis.

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**Laparoscopic Excision of Recurrent Pelvic Lymphocyst Following Pelvic Lymph Node Dissection for Clear Cell Carcinoma of Ovary**

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**Study Objective:** Demonstration of safe laparoscopic technique for definitive excision of recurrent pelvic lymphocyst developing following pelvic lymph node dissection for clear cell carcinoma of the ovary; overcoming
the additional surgical challenges of close proximity to vital anatomical structures and dense post-operative adhesions.

**Design:** Surgical video detailing a systematic approach to laparoscopic excision of pelvic lymphocyst - describing individual surgical steps and highlighting relevant anatomy.

**Setting:** Surgery was undertaken by a gynae-oncology consultant with one surgical assistant. The patient was positioned in modified Lloyd-Davis – with table height and stack adjusted for optimal ergonomics.

**Patients or Participants:** A 68 year old lady underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy and omentectomy in April 2018 for stage 1A clear cell carcinoma of ovary; followed by completion laparoscopic pelvic and para-aortic lymphadenectomy. The patient subsequently developed a right pelvic lymphocyst, causing pain. Pre-operative imaging described a 3.9 × 3.3 × 3 centimetre right pelvic lymphocyst, with internal septations and thick wall. Two attempts at percutaneous drainage were unsuccessful due to difficulty penetrating the cyst capsule and loculated interior.

**Interventions:** Laparoscopic excision of pelvic lymphocyst was undertaken. Pseudoperitoneum was maintained at a pressure of 12mmHg throughout. The pelvic peritoneum overlying the lymphocyst was opened and plane developed using a combination of monopolar, bipolar and advanced energy devices. The ureter and iliac vessels were systematically identified to avoid inadvertent injury; and avascular pelvic spaces developed to aid cleavage of the capsule with minimal blood loss.

**Measurements and Main Results:** No intra or post-operative complications occurred. Histopathology confirmed a benign lymphocyst. At post-operative review, the patient reported resolution of pain and improved mobility.

**Conclusion:** This video demonstrates a safe laparoscopic approach to excision of a densely adherent pelvic lymphocyst, abutting important pelvic structures – facilitated by the step-wise identification of pelvic anatomy and relevant pelvic spaces.

**Fundamentals of Laparoscopic Surgery Exam: A Cross-Sectional Survey of In-Training Obstetricians and Gynecologists**

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**Study Objective:** Physicians seeking specialty certification in Obstetrics and Gynecology are now required to successfully complete the Fundamentals of Laparoscopic Surgery (FLS) exam in order to meet the American Board of Obstetrics and Gynecology (ABOG) certification requirement. We conducted a survey of U.S Obstetrics and Gynecology physicians in training in an attempt to assess their laparoscopic surgical training and perceived barriers and limitations to successfully obtain FLS certification.

**Design:** Observational.

**Setting:** Internet-based survey of United States Obstetrics and Gynecology residency programs.

**Patients or Participants:** U.S Obstetrics and Gynecology residents.

**Interventions:** Participants were asked to self-evaluate their confidence in conducting laparoscopic procedures.

**Measurements and Main Results:** Of the 237 U.S Obstetrics and Gynecology programs, 146 residents responded. Seventy-one (48%) respondents completed the FLS exam and reported a 93% pass rate. All those who did not pass reported poor performance on the manual skills portion. Sixty-six (93%) respondents felt the laparoscopic box trainer was most helpful in preparation for the FLS exam. Fifty-five (79%) respondents felt the cognitive portion of the exam was not at all or slightly representative of subjects taught in residency. Thirty-three (47%) respondents felt the skills portion was moderately reflective of laparoscopic skills needed in gynecologic surgery. Thirty-eight (54%) respondents felt preparing for this exam was not at all or slightly helpful in clinical or surgical practice.

**Conclusion:** The laparoscopic box trainer appears to be most useful in preparation for the FLS exam. Most respondents agree the skills portion of the exam represents skills required in Obstetrics and Gynecology. Concern remains whether the cognitive portion of the exam is applicable to Obstetrics and Gynecology residents or if residency programs need to broaden their laparoscopic education. Alterations likely need to be made to the exam to more specifically evaluate fundamental laparoscopic surgical skills in gynecologic surgeons.

**A Resident’s Guide to Laparoscopic Isthmocele Repair**

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**Study Objective:** The objective is to demonstrate laparoscopic repair of a c-section scar isthmocele using hysteroscopic guidance.

**Design:** N/A

**Setting:** 40yo G1P1 with secondary infertility was found to have fluid within her c-section scar. Pelvic ultrasound revealed a fluid-filled 11 × 9 × 17mm defect spanning the width of the cervix, consistent with a c-section scar isthmocele. Informed consent was obtained for laparoscopic repair with hysteroscopic guidance; however, she was counseled on the risk of recurrence, infertility, uterine rupture and need for future c-section. Hysterectomy demonstrated a narrow diverticulum along the anterior aspect of the upper cervix with scar tissue. On laparoscopy there were dense uterine to abdominal wall adhesions.

**Patients or Participants:** N/A

**Interventions:** The case begins with lysis of abdominal wall adhesions using the harmonic scalpel. The bladder is mobilized past the level of the cervical-uterine junction. A hysterectomy is performed concurrently during which the cephalad and caudal borders of the isthmocele are transilluminated and marked with the harmonic scalpel. Dilute vasopressin is injected into the area of resection. The harmonic scalpel excises the scar, using the prior marks as a guide and taking care to avoid the uterine vessels. The defect is closed in three layers, which involves interrupted sutures to reapproximate the endocervical canal, then two barbed imbricating layers in a running fashion. Once hemostasis is assured the bladder flap is reapproximated.

**Measurements and Main Results:** At her postoperative visit, the patient felt well without pain or abnormal bleeding. She has not been seen for imaging due to the COVID-19 pandemic, however as of May 2020 she is attempting to conceive again.

**Conclusion:** C-section scar isthmocles are amenable to laparoscopic excision with primary repair. The concurrent use of hysteroscopy facilitates identification of the isthmocle borders. Patients should be counseled regarding the risk of uterine rupture and need for future c-sections.

**Robotic-Assisted Laparoscopic Repair of Post-Hysterectomy Vesicovaginal Fistula Using Omental Interposition Flap**

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**Study Objective:** To demonstrate, via robotic-assisted laparoscopy, a transperitoneal technique for repair of post-hysterectomy vesicovaginal fistula (VVF) using an omental interposition flap.

**Design:** Video article.
Setting: University Hospital and referral center for Gynaecological disease.

Patients or Participants: A 52-year-old woman with VVF after laparoscopic hysterectomy.

Interventions: Repair of post-hysterectomy VVF with omental flap interposition.

Measurements and Main Results: A 52-year-old woman with a history of menorrhagia refractory to medical treatment underwent a total laparoscopic hysterectomy and bilateral salpingectomy. Histology of the uterus showed multiple uterine fibroids and adenomyosis. Twelve days following the hysterecomy, she developed leakage of urine per vagina. Computed tomography scan and cystourethrograph demonstrated normal ureters and presence of a vesicovaginal fistula. An indwelling catheter was inserted to rest the bladder and allow the acute inflammation surrounding the fistula to subside prior to definitive surgical repair six weeks later. The repair consisted of seven steps:

1. Restoration of anatomy
2. Opening the vaginal vault
3. Identification of fistula defect
4. Resection of fistula tract
5. Dissection of vesicervical space
6. Closure of vesical and vaginal defects
7. Interposition of omental graft

The patient was discharged 48 hours after surgery. The indwelling catheter was maintained for 14 days. Cystourethrograph was carried out to confirm the integrity of the bladder prior to catheter removal. There was no further vaginal loss. Clinical follow up at six weeks and three months post-repair showed no bladder or vaginal dysfunction.

Conclusion: Robotic-assisted laparoscopy is a feasible approach for repair of VVF, which can be performed systematically using seven steps. This technology lends itself well to procedures requiring intricate dissection and multi-layered suturing as demonstrated in this case.

Three Degrees of Separation: Complete Uterine Septums

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Study Objective: The goal of this video is to review how to diagnose and surgically manage three variations of incomplete Mullerian duct fusion and reabsorption. We focus on the differences between a complete septate uterus with a single septate cervix (unicollis), a septate uterus with duplicated cervix (bicollis), and a complete duplication of the uterus and cervix (uterine didelphys).

Design: N/A

Setting: All procedures were conducted at an academic medical center in the operating room setting. The patients were positioned in dorsal lithotomy with the legs supported using yellowfin stirrups.

Patients or Participants: Photos and video footage of three patients were collected during their respective surgeries in the operating room.

Interventions: We demonstrate the operative methods for safe vaginal, cervical and uterine septoplasty. In particular, we show different techniques that can be used for uterine/cervical septoplasty in the case of a complete septate uterus bicollis. We contrast this with the surgical management of a complete septate uterus unicollis.

Measurements and Main Results: N/A

Conclusion: This video explores the diagnosis and treatment of three Mullerian anomalies. Prior to surgical correction, it is essential to determine the specific type of anomaly. A complete septate uterus may be unicollis or bicollis; this is an important distinction due to their differing surgical management. In the case of a bicollis, we assert that it is best to avoid incision and repair of the two cervical canals due to the potential risk of cervical incompetence. A didelphys uterus does not require surgical intervention unless there is an accompanying symptomatic vaginal septum.

Risk Factors for Blood Transfusion in Women Requiring Surgical Management of Ectopic Pregnancy

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Study Objective: To identify preoperative risk factors associated with blood transfusion in women undergoing surgery for ectopic pregnancy.

Design: Retrospective cohort study.

Setting: Academic-affiliated community hospital system.

Patients or Participants: Patients who underwent surgery for ectopic pregnancy between January 2014 and October 2017.

Interventions: Review and analysis of patient characteristics and perioperative care.

Measurements and Main Results: In this cohort of 252 women, the overall transfusion rate was 8.7% (n=22). Increasing age (mean 33.1y vs 29.8y, p=0.0087), decreased systolic blood pressure (SBP) on presentation (113.0mmHg vs 123.1mmHg, p=0.0024), lower minimum SBP (93.8mmHg vs 111.9mmHg, p<0.0001), lower minimum diastolic blood pressure (51.3mmHg vs 63.9mmHg, p<0.0001), and lower preoperative hemoglobin (10.0g/dL vs 12.0g/dL, p<0.0001) were associated with higher rates of blood transfusion. History of cesarean section was more common in women who were transfused (47.1% vs 19.2%, p=0.0134). Complex free fluid was seen on ultrasound in 90.5% of women who were transfused, compared with 59.2% of women who were not transfused (p=0.0185).

Pain alone was the chief complaint in women who required transfusion (77.5%, p=0.0079). Receiving care in a women’s specific triage area (compared with presentation to an emergency room) was protective against transfusion (rate of transfusion 2.1% vs 27.1%, p<0.0001). Women who had prior care for the pregnancy were less likely to be transfused (p=0.0012). Heart rate, quantitative HCG, ectopic size (by ultrasound), and history of pelvic inflammatory disease were not associated with transfusion risk. Patients who were transfused arrived in the operating room in less time, although this was not statistically significant (287min vs 385.3min, p=0.067).

Conclusion: There is a high rate of transfusion in women undergoing surgical treatment of ectopic pregnancy. Identification of preoperative, potentially modifiable risk factors should aid in targeting interventions to improve transfusion rates in this young population.

Hysteroscopic Resection of an Interstitial Ectopic Pregnancy

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Study Objective: We demonstrate a novel approach for treatment of an interstitial ectopic pregnancy via hysteroscopic resection under laparoscopic guidance.

Design: N/A

Setting: The patient was a 29 year old G2P0010 with an enlarging interstitial pregnancy despite treatment with methotrexate. The surgery was performed in an ambulatory center affiliated with a tertiary teaching hospital.

Patients or Participants: N/A

Interventions: We performed a resection of an interstitial ectopic pregnancy hysteroscopically with the aid of laparoscopic visualization. This surgical approach was undertaken after both hysteroscopic and laparoscopic evaluation determined its feasibility.

Measurements and Main Results: N/A

Conclusion: Interstitial ectopic pregnancies are rare, and factors such as hemodynamic stability, gestational age, and surgeon expertise must be considered in surgical planning. Hysteroscopic resection of an interstitial pregnancy under laparoscopic guidance can be employed safely in select surgery.
cases. When appropriate, this technique allows treatment of an ectopic pregnancy with avoidance of more morbid, traditional treatments such as a cornuostomy or cornual wedge resection.

**Surgical Pearls for Laparoscopic Resection of a Cervical Leiomyoma**

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**Study Objective:** To describe and demonstrate surgical pearls for complete laparoscopic excision of a cervical leiomyoma.

**Design:** Video presentation of a clinical case with imaging, surgical procedure, and key teaching points.

**Setting:** Academic Institution.

**Patients or Participants:** 33-year-old G0 woman with a 4-year history of infertility and abnormal uterine bleeding refractory to hormonal agents.

**Interventions:** The patient underwent a diagnostic hysteroscopy, laparoscopic myomectomy, and chromoperturbation.

**Measurements and Main Results:** Surgical recommendations for safe and effective laparoscopic resection of cervical myomas include dissection of the bladder using a lateral to medial approach, backfilling of the bladder when necessary to avoid injury, and taking care to avoid entry into the cervical canal while achieving complete excision. A pediatric Foley catheter can function as stent to post-operative cervical stenosis. Additional techniques for hemostasis in this type of complex surgery are also reviewed. Retroperitoneal isolation of the ureteric arteries and the use of laparoscopic bulldog clamps may be necessary for larger myomas.

**Conclusion:** Complete laparoscopic resection of cervical myomas can be performed safely and effectively with preservation of the uterus for future fertility. Several techniques reviewed in this video may be useful to reduce surgical morbidity and allow a minimally invasive approach.

**Robotic-Assisted Resection of Ovarian Remnant Causing Pelvic Pain**

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**Study Objective:** To demonstrate the safe and effective excision of an ovarian remnant in the face of extensive pelvic adhesions.

**Design:** Surgical video presentation.

**Setting:** Academic tertiary care center.

**Patients or Participants:** This is a 46-year-old patient G7P5025 patient with a history of chronic pelvic pain. Her past surgical history is significant for a total abdominal hysterectomy followed by a right salpingo-oophorectomy 8 years later for an ovarian cyst. Her right salpingo-oophorectomy surgery was complicated by an enterotomy with injury to the sigmoid colon due extensive pelvic adhesive disease.

**Interventions:** Preoperative pelvic ultrasound and MRI revealed a large left sided cystic pelvic mass as well as a right adnexal mass suspicious for an ovarian remnant. Intraoperatively, extensive pelvic adhesions were noted as well as the large cystic pelvic mass and an ovarian remnant attached to the right pelvic side wall. A left oophorectomy was performed and the right ovarian remnant was excised after extensive ureterolysis.

**Measurements and Main Results:** After the above interventions normal anatomy was restored to the pelvis. Pathologic evaluation confirmed right ovarian cortical tissue. At her 6 months follow up visit the patient had significant resolution of her pelvic pain.

**Conclusion:** Surgical removal of an ovarian remnant can be quite challenging and has risks of injury to the ureters, bladder and bowel. With good surgical technique using the laparoscopic/robotic platform, safe and effective excision of ovarian remnant can be achieved; affording a favorable outcome for patients.

**Review of Conventional Laparoscopic Techniques for Management of Cornual Ectopic Pregnancy**

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**Study Objective:** To review laparoscopic techniques utilized in the management of a cornual ectopic pregnancy.

**Design:** Review of current techniques with inclusion of a single case report.

**Setting:** Single institution.

**Patients or Participants:** Single case report.

**Interventions:** Laparoscopic resection of a right cornual ectopic pregnancy and right salpingectomy

**Measurements and Main Results:** A review of techniques utilized to perform conventional laparoscopy with regard to cornual ectopic pregnancy. We then describe a case report of a 26-year-old G3P1011 who presented to the ER with a right cornual ectopic pregnancy. A laparoscopic resection of the right cornual ectopic pregnancy and right salpingectomy was performed. Preoperative planning included fluid resuscitation with administration of 2 units of blood and 2 units on hold during surgery. Pitressin was injected before incision of the uterine serosa. The myometrium and uterine serosa were incised superficially numerous times with the goal of delivering the gestational tissue en-bloc. Hydrodissection and traction-countertraction were utilized to deliver the tissue. The incision was closed in two layers with the Endo Stitch device and a barbed V-Loc suture. Final pathology was consistent with gestational products. Patient recovered with no complications.

**Conclusion:** Laparoscopic surgery is a safe and effective treatment modality of cornual ectopic pregnancy with preparation key to a successful operation. Numerous techniques can be utilized to improve surgical outcomes such as the use of Pitressin to minimize bleeding, hydrodissection to delineate planes, and the Endo Stitch device for increased ease of suturing.

**Do Children That Play Video Games Perform Better in Surgery?**

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**Study Objective:** To determine if children that spend average to above-average amount of time playing video games perform in a shorter time a designed surgical task compared to children that play less video games. This is the first-ever experiment purely on children.

**Design:** According to the Center on Media for Kids, the average video game playing is about 2 hours per day (14 hours per week). Questionnaires, consent forms were sent and accomplished. Age-appropriate set of surgical tasks using laparoscopic trainer were devised. Instructional videos, personal directions shown in how to do surgical tasks. Task
The paravesical space was opened. A bladder flap was

Study Objective: To describe opioid prescribing practices in women undergoing elective gynecologic surgery for benign indications and determine the rate of new persistent opioid use (NPOU) among opioid-naive women.

Design: Retrospective population-based cohort study using linked administrative data from a government administered single-payer healthcare system.

Setting: N/A

Patients or Participants: Adult women (≥18 years of age) who underwent elective gynecologic surgery between January 1st 2013 and March 31st 2018 for benign indications in Ontario, Canada. Women were included if they were opioid-naive in the year prior to surgery.

Interventions: N/A

Measurements and Main Results: The primary outcome was peri-operative opioid use defined as ≥1 opioid prescription from 30 days before to 14 days after surgery. NPOU after gynecologic surgery was defined as having filled ≥1 opioid prescriptions between 91 days to 180 days post-operatively. Multivariable log-linear regression analyses were employed to adjust for clinical and demographic data.

There were 132,506 patients included in our cohort. Perioperative opioid use was documented in 27,763 (21.0%) patients and NPOU was documented in 4,827 (3.65%) patients undergoing gynecologic surgery. Patients who filled an opioid prescription were significantly more likely to develop NPOU (unadjusted OR 1.49, 95%CI 1.40-1.59, p<0.0001). For every 65 patients with perioperative opioid use, 1 will develop NPOU. Patients who filled an opioid prescription were significantly more likely to develop NPOU if they were healthier, had any mental health diagnosis, had substance/addiction disorder, or had a diagnosis of infertility. Patients in the highest quintiles of total prescribed oral morphine equivalents were also more likely to develop persistent opioid use.

Conclusion: Women undergoing gynecologic surgeries, irrelevant of level of invasiveness, are at increased of developing NPOU when filling an opioid prescription due to their surgery. Opioids play an important role in managing post-operative pain, however, the risks and benefits of prescribing them must be carefully weighed by healthcare providers.

Secrets for a Successful Surgical Systematization in the Treatment of Posterior Compartment Endometriosis

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Study Objective: Demonstrate the secrets of the laparoscopic systematication in the treatment of posterior compartment endometriosis.

Design: Video demonstrating the systematic technique step by step (Canadian Task Force classification III)

Setting: Surgery performed in 30-year-old patient, G0P0, with progressive dysmenorrhea, dyspareunia, menometrorrhagia and infertility. Upon vaginal and rectal touch, palpable thickening of the uterosacral ligaments was noticed with pain on mobilization. The MRI scan showed a low T2 signal lesion over the uterosacral ligaments, resulting in extrinsic damage to the right ureter.

Patients or Participants: N/A

Interventions: The nerve sparing laparoscopic excision systematization technique was the following:
1) Carry out the inspection of the cavity without targeting the central disease at first.
2) Mobilization of the sigmoid colon, identifying the line of separation between the mesosigmoid and the parietal peritoneum, above the paracolic gutters.
3) Exposure of the left pararectal fossa, keeping the ureter and mesoureter as the lateral limit and the rectum as the medial limit, dissecting caudally until we surpass lesion.
4) Fixation of the ovaries, exposing the posterior leaflet of the broad ligament.
5) Left ureterolysis begins at level of the promontory, with cranio-caudal and lateromedial movements over the ureter, until the proximity with the posterior leaflet of the broad ligament. We then lateralize the ureter to expose the left uterosacral ligament
6) Resection of the left uterosacral ligament, keeping the ureter and hypogastric nerve lateralized - exposing the rectovaginal space.
7) Target the rectovaginal septum from lateral to medial, facilitating the identification of the mesorectum, dissected in a posterior direction. The same steps are performed in the right hemi-pelvis respecting their anatomical differences.

Measurements and Main Results: The lesions were excised without complications and with minimal blood loss.

Conclusion: The surgical systematization proposed is a viable and reproducible technique and may offer greater damage control.

Tips for Performing a Combined Robotic Assisted Sacrocolpopexy and Ventral Rectopexy
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Study Objective: In this video we highlight our technical tips for performing a combined robotic sacrocolpopexy and ventral rectopexy for concomitant posterior, middle and anterior compartment prolapse.

Design: Video submission.

Setting: Collaboration between FPMRS and Colorectal Surgery specialists in a community teaching hospital.

Patients or Participants: 55-year-old G1P1 overweight female s/p laparoscopic hysterectomy and bilateral oophorectomy for endometriosis presenting with severe obstructed defecation syndrome (ODS) and incomplete bladder emptying. On exam she had a grade 2 rectocele, a grade 1 vault prolapse, and a grade 2 cystocele. She scored 22 points on a KESS constipation questionnaire. A 3D transvaginal/transrectal and translabial ultrasound showed a grade 3 rectocele, enterocele causing rectal intussusception and a cystocele that descended below the pubic bone.

Interventions: For the robotic surgery the patient was positioned in dorsal lithotomy and maximum Trendelenburg. She underwent a combined robotic assisted laparoscopic sacrocolpopexy with polypropylene mesh and ventral rectopexy with cross linked porcine dermis mesh.

Measurements and Main Results: Preoperative and 3 months postoperative 3D transvaginal/ transrectal and translabial ultrasounds, KESS constipation questionnaire, PFDI-20, and PFIQ-7. Three months after her surgery her ODS symptoms have resolved, her KESS score dropped from 22 to 12 points, and on repeat ultrasound she had no residual pelvic prolapse, no obstruction on straining and no cystocele.

Conclusion: For patients with vaginal vault prolapse, cystocele, and rectocele a combined sacrocolpopexy and ventral rectopexy can be an effective surgical intervention.

Study Objective: To evaluate laparoscopic sacrocolpopexy operative times, complication rates and long-term surgical outcomes at one academic institution with significant trainee involvement.

Design: This is a retrospective chart review of laparoscopic sacrocolpopexy cases.

Setting: Cases took place in an operating room at a large academic medical center. Patients were in dorsal lithotomy position with five abdominal laparoscopic trocar sites.

Patients or Participants: A series of 181 consecutive laparoscopic sacrocolpopexy cases (with or without concomitant procedures) were examined between February 2014 and August 2019.

Interventions: None.

Measurements and Main Results: Descriptive statistics were used to compare primary outcomes with published literature. The average operative time was 139.9 minutes, compared to 180-190 minutes noted in other studies. Four cases of intraoperative cystotomy (2.2%) and one enterotomy (0.6%) were noted compared to 5-6% and 1.4% respectively in the literature (Sheyn et al 2019). There were 16 cases of postoperative urinary tract infection (8.8%). At their most recent postoperative visit, which occurred on average at postoperative day 278, recurrent prolapse was noted in 11.7% of patients and 3.9% of those patients underwent a subsequent repair to correct their prolapse. Other complications included 0.6% small bowel obstruction, 1.1% mesh erosion and 7.7% de-novo stress urinary incontinence; all of these were less than those documented in the literature. The overall complication rate was 15.4% compared to 18% in the literature (Nosti et al 2014).

Conclusion: This institutional demonstrates short operative times, low complication rates and favorable outcomes with resident involvement in laparoscopic sacrocolpopexy. This indicates advanced urogynecology procedures can be performed with significant resident involvement without compromising operative time and surgical outcomes.

Predictors of Urinary Tract Infection after Benign Hysterectomy Performed at a Teaching Hospital: Can We Improve Our Infection Rate
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Study Objective: To describe the rate of urinary tract infection (UTI) after benign hysterectomy at the county hospital and to evaluate clinical predictors of UTI at the time of discharge from the hospital.

Design: This is a retrospective cohort study. Patients were separated in two groups: those with and those without UTI within 30 days of their hysterectomy. Demographics, surgical procedures and outcomes were compared.

Setting: Teaching county hospital in Texas.

Patients or Participants: All patients undergoing hysterectomy for benign disease from January 2017 to December 2018.

Interventions: NA.

Measurements and Main Results: 474 patients were included in the study. Our patient population was comprised of Hispanics (70%), Obese (58.4%), diabetics (14.3%), menopausal (13.5%) and smokers (12.4%). Our minimally invasive rate was 70%. 14% of patients had an additional urogynecological procedure. Cystoscopy was used in only 49.2% of cases. Our minimally invasive rate was 70%. 14% of patients had an additional urogynecological procedure. Cystoscopy was used in only 49.2% of cases. 18.7% of patients were discharged the same day. 5% of patients were sent home with an indwelling catheter. The rate of UTI was 11.4% (54 patients).

On univariate analysis, patients with UTI were more likely to be Hispanic, undergo a vaginal approach compared to a laparoscopic or abdominal route, undergo a concomitant urogynecological procedure, have a Foley
catheter for longer than 24 hours and be sent home with an indwelling catheter (all p <0.01). Interestingly, having had a cystoscopy was not associated with an increased risk of UTI in our cohort. On multivariate regression and after adjusting for all significant variables, prolonged catheterization was the only significant predictor for UTI in our cohort, (14.8% versus 12.1%, OR=2.86(1.04-7.3), p=0.03).

**Conclusion:** Our UTI rate after benign hysterectomy is high and appears to be driven by the rate of prolonged catheterization. Improved patient education related to catheter care and possibly prophylactic antibiotics may be helpful in improving this rate and could be performed as a quality improvement project.

### The Role of the Grade and Location of Intra Uterine Adhesions in Women with Asherman’s Disease and Abnormal Invasive Placentaion

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**Study Objective:** Does the grade and location of the intra uterine adhesions in women with Asherman’s disease determine the location of the placenta and the presence of abnormal invasive placentaion (AIP).

**Design:** Observational Study.

**Setting:** Asherman Expertise Centre, Spaarne Gasthuis Hospital, an academic affiliated community hospital in The Netherlands.

**Patients or Participants:** Women with Asherman’s disease.

**Interventions:** The patients all underwent successful hysteroscopic adhesiolysis. Pregnancies were monitored. Ultrasound and MRI was used to recognize abnormal invasive placentaion (AIP). A control hysteroscopy was performed 3 months after pregnancy.

**Measurements and Main Results:** 20 women with AIP during pregnancy after successful adhesiolysis were identified between 2017-2019. They had moderate to severe intra uterine adhesions prior to surgery after a first trimester curetage of a post-partum procedure. They all had an ultrasound at 28 weeks of gestational age, to determine the location of the placenta and to prenatally diagnose AIP. There was a relation between the grade and location of the intra uterine adhesions and the presence of AIP. There was also a relation between the location and severity of adhesions and the risk of a retained products of conception (RPOC) diagnosed by a control hysteroscopy 3 months after delivery.

**Conclusion:** The location and grade of the intra uterine adhesions plays a pivotal role in developing AIP.

### Endometrioma, Fertility, and the Recommended Surgical Treatment: An Evidence Based Approach

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**Study Objective:** To design an evidence-based treatment algorithm for endometriomas in women of reproductive age with a focus on fertility outcomes.

**Design:** Comprehensive literature search using PubMed/MEDLINE and Cochrane Review, including reference hand searches.

**Setting:** January 1990 - May 2020.

**Patients or Participants:** N/A

**Interventions:** Search terms “endometriosis”, “endometrioma”, “infertility”, “fertility”, “Assisted Reproductive Technology”, “in vitro fertilization”, “ovarian reserve”, “anti-mullerian hormone”, “antral follicle count”, “pelvic pain” and “surgery”; were utilized alone and in combination. Thirty-five relevant publications were included.

**Measurements and Main Results:** Women with endometriomas have lower baseline ovarian reserve compared with controls without disease. Excisional surgery of these tumors, however, confers worse fertility potential compared with conservative management. In women with an endometrioma and pain, excision is recommended. Conservation of the hilum is paramount in protecting ovarian reserve, and the use of non-thermal hemostatic methods will limit ovarian cortex vascular damage. Full excision of cyst wall will render low tumor recurrence rates. In women without pain, conservative management is recommended, especially in the context of patients preparing for in-vitro fertilization. Rates of adverse events at oocyte retrieval for women with endometriomas in situ are low or theoretical at best. Larger-sized tumors and bilaterality may correlate more highly with lower ovarian reserve, but excision does not confer benefit. These outcomes remain true in studies with long term follow-up and in studies in which procedures are performed by surgeons with advanced training.

**Conclusion:** Endometrioma excision is not indicated for women without pain, particularly in the context of fertility. If excision becomes necessary, non-thermal hemostatic methods are indicated. There may be a role for partial excision and base ablation or excision with non-thermal hemostatic agents, but the ovarian hilum must be preserved. Further surgical trials comparing excision versus conservative management with long term follow up are needed.

### Risk Score for the Prediction of Surgically Proven Recurrent Adnexal Torsion

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**Study Objective:** To develop a risk score for surgically proven recurrent adnexal torsion (rAT), among women with a previous adnexal torsion proven surgically.

**Design:** A retrospective cohort study between 2011 and 2020.

**Setting:** A tertiary, university affiliated medical center.

**Patients or Participants:** All women with a history of surgically confirmed adnexal torsion, who underwent surgical diagnostic procedure due to a suspected rAT. Overall, 115 women were included.

**Interventions:** Operative laparoscopy.

**Measurements and Main Results:** We collected demographic and clinical characteristics, sonographic findings and laboratory results of all suspected rAT cases that subsequently underwent surgery. We compared cases with adnexal torsion to cases without, as confirmed by operative laparoscopy. Adnexal torsion was identified in 86 (74.8%) of the surgical procedures. Age and pregnancy rates were similar in both groups. Women with adnexal torsion had less prior pelvic surgeries (excluding prior adnexal torsion) [OR(95%CI) 0.24(0.09-0.59), p=0.001], prior oophorexy [OR(95%CI) 0.36(0.13-0.97), p=0.04] or right adnexal tenderness [OR(95%CI) 0.21 (0.08-0.52), p<0.001] on physical examination. The proportion of virgin women [OR(95%CI) 7.41(0.94-58.2), p=0.04], pregnancies following assisted reproductive technology [OR (95%CI) 4.6(1.01-21.12), p=0.03] and enlarged ovaries [OR(95%CI) 2.88(1.15-7.21), p=0.02] was higher in the adnexal torsion group. The affected ovary’s size was significantly larger in the torsion group (p=0.001).

After multivariate analysis, four risk factors remained significantly independently associated with adnexal torsion. Previous pelvic surgery [aOR(95%CI) 0.06(0.007-0.54), p=0.01] and right side pain [aOR (95%CI) 0.05(0.008-0.33), p=0.002] were negatively associated with adnexal torsion. A larger maximal diameter of the affected ovary [aOR(95%CI) 1.78(1.08-2.93), p=0.02] and enlarged ovary [aOR (95%CI) 7.40(1.28-42.59), p=0.02] were positively associated with adnexal torsion.
Conclusion: Our risk score enables to predict a true positive rAT that may assist clinicians in decision management in cases of suspected rAT.

Palpation to Identify Non-Visualized Bowel Endometriosis during Laparoscopic-Assisted Rectal or Sigmoid Segmental Resection

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Study Objective: To determine the prevalence of palpable non-visualized bowel endometriotic nodules in women having a laparoscopic-assisted segmental bowel resection for large endometriotic lesions and to compare the operative findings and early postoperative complications with and without palpable non-visualized lesions.

Design: Observational with follow-up of 2.8 months to 1.2 years.

Setting: Multispecialty center.

Patients or Participants: Forty-nine patients with large endometriotic lesions of the rectum or sigmoid colon who underwent segmental resection.

Interventions: The patients underwent laparoscopic dissection and placement of the distal stapling devise and then exteriorization of the specimen through a small suprapubic incision. The proximal stapler was applied after a modification of the standard procedure that consisted of palpation anticipating small palpable lesions and to include those in the specimen. Hand-assisted laparoscopy and using rectal probes for recognition were not studied.

Measurements and Main Results: Eleven (22.4%) of the 49 patients who underwent sigmoid or rectal resection were found to have palpable non-visualized lesions of 2 mm to 10 mm. The median length of the proximal resected segment increased by 10 mm (range 5-30 mm) compared to the group with no such lesions. The was no difference in the short-term complication rate between the two groups.

Conclusion: This suggests that palpation for recognition, diagnosis, and treatment is useful in 22.4% of women undergoing laparoscopic-assisted colon resection for stapler placement. The presence of palpable, non-visualized endometriotic lesions adds to the controversy about the type of surgery needed for symptomatic endometriosis of the rectum and sigmoid colon. Although only 1% to 5% of patients have repeat surgery for symptomatic recurrence, the use of focused palpation may lower that further. The use of hand-assisted laparoscopy or rectal probes for recognition also need investigation.

Clinical Significance of Superficial Endometriosis

Implants on Magnetic Resonance Imaging

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Study Objective: The purpose of this study was to examine the symptomatology and treatment outcomes for patients with superficial endometriosis lesions found on MRI using novel detection methods.

Design: A retrospective chart review over a 10-year period of patients referred for MRI with keyword of “endometriosis” within the report. MRIs were performed by an expert team of radiologists trained for detection of superficial endometriosis lesions.

Setting: N/A

Patients or Participants: 161 charts were reviewed of patients referred for MRI over a 10-year period with 100 meeting criteria for MRI evidence of endometriosis and 50 with detectable superficial endometriosis implants.

Interventions: N/A

Measurements and Main Results: Of the 100 patients with MRI evidence of endometriosis, 18 patients had superficial implants alone without endometriomas or deep infiltrating endometriosis. Patients who only had superficial implants were significantly more likely to report symptoms of sexual dysfunction (2(1, N=100)= 7.454, p <.05). They were also significantly less likely to have surgery within one year (2(1, N=100)=5.426, p<.05) compared to patients with other endometriosis lesions. There was no significant difference between those with superficial lesions and those with other lesions regarding NSAID use, prior surgery for endometriosis, medication use (overall or type), pain symptoms, infertility, or presence of GI/GU symptoms. Of the patients who only had superficial implants, 50% had had surgery for endometriosis, 17% would have surgery within a year of the MRI, 56% were on some medication, 72% reported pain, 39% reported sexual dysfunction, and 11% reported infertility.

Conclusion: MRI capabilities have expanded to include detection of superficial endometriosis lesions but the clinical relevance of these findings is still being elucidated. This study suggests that these superficial implants are clinically significant for patients’ quality of life but may potentially differ regarding symptom profile including increased sexual dysfunction complaints and overall management pursued, medical as opposed to surgical.

Preparing OB/GYN Residents for the Fundamentals of Laparoscopic Surgery Exam

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Study Objective: Describe our experience preparing residents for the ABOG-required Fundamentals of Laparoscopic Surgery (FLS) exam.

Design: Survey.

Setting: Post-exam survey distributed May 2020 to evaluate curriculum.

Patients or Participants: OB/GYN residents.

Interventions: FLS proficiency-based curriculum was implemented. Proctored practice sessions were provided by faculty or MIGS fellow every 5 weeks.

Measurements and Main Results: Thirty residents across two programs took the 2019 FLS exam with 100% first attempt pass rate (20 PGY3, 10 PGY2). Survey response rate was 24/30 (80%). 100% reported they felt “very prepared” or “prepared” for the hands-on skill exam compared to 54.17% for the didactic portion. 95.8% believed the didactic modules ≥ twice. A strong correlation was not observed between number of times modules viewed and feelings of preparedness for the didactic portion of the exam (r=0.25). 95.8% reported practicing skills with faculty or MIGS fellow prior to their test and 100% found these sessions helpful. Most residents spent >5 hours practicing skills prior to their exam (50% practiced 5-10 hours, 33.3% practiced >10 hours). 87.5% noted >75% of practice time was in addition to protected teaching time. 95.8% reported FLS skills practice resulted in improved surgical skills, although 54.17% felt improvement was small. 83.3% felt taking the exam in the second year of residency was best in preparing them to get the most out of their OR experience while 12.5% felt like the first year would be a better year to take it. Residents reported improved access to equipment, more proctored sessions earlier in the year, and more protected time to independently practice would improve their exam preparation.

Conclusion: Implementation of the FLS proficiency based curriculum was successful across two OB/GYN residency programs with 100% pass rate.
and 100% of residents feeling very prepared/prepared to take the hands on portion of the FLS exam.

**Durability of Laparoscopic Myomectomy**

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**Study Objective:** To determine the the time to re-intervention for fibroid symptoms following robotic or laparoscopic myomectomy by sub-specialty trained gynecologic surgeons.

**Design:** Retrospective cohort of patients who underwent robot-assisted and traditional laparoscopic myomectomy from 2005 through 2019 at tertiary care academic hospitals operating in Arizona, Florida, and Minnesota.

**Setting:** Three tertiary-care academic hospitals.

**Patients or Participants:** Electronic medical record database was surveyed using CPT codes for laparoscopic myomectomy yielding 592 charts, all of which were reviewed. After exclusion of those who underwent myomectomy for an indication other than symptoms attributable to uterine fibroids 451 patient charts remained for analysis.

**Interventions:** Any treatments targeting a symptom attributed to uterine fibroids following initial surgery were considered “rereatment.” Both medical and surgical managements were included.

**Measurements and Main Results:** Cumulative incidence curves were calculated for time to re-treatment event and log-rank tests used to compare curves between: route of laparoscopic myomectomy, age group, BMI, race, parity, diagnosis group, FIGO grade, and myoma weight. Overall incidence of re-treatment was 5.96% per year. Women less than 40 years of age were significantly more likely to require retreatment, 8.22% per year, compared to those older than 40, 4.18% per year (p=0.003). There were no significant differences between time to treat based on any other demographic. Thirteen percent of patients required retreatment and the majority (26, 44%) of these 59 patients underwent hysterectomy, followed by repeat myomectomy (13, 22%), and medical management (13, 22%).

**Conclusion:** The incidence of re-treatment was found to be less than 6% per year for minimally invasive myomectomy, and only 13% of patients required some form of re-intervention demonstrating that minimally invasive myomectomy is a durable procedure for treatment of symptomatic fibroids. Further, the longevity of this treatment is greater in patients older than 40, as compared to their younger counterparts.

**Robotic Resection of a Non-Communicating Right Uterine Horn**

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**Study Objective:** When feasible, vaginal hysterectomy has been shown to be the safest and most cost-effective route to remove the uterus compared to abdominal, laparoscopic or robotic techniques. In the US, vaginal hysterectomy is performed in only 20% of cases. This study evaluates the safety and feasibility of a novel humanoid shaped robot assisted surgical system for transvaginal laparoscopic hysterectomy.

**Measurements and Main Results:** The procedures had an average time of 57 minutes (range: 24 to 88 min) with the estimated blood loss for 80% of subjects less than 100ml (24/30), 13% between 100-200ml (4/30) and 7% at 400ml (2/30). All patients’ vaginal cuff and point of entry healed as expected at the six weeks follow up visit.

**Conclusion:** The positive results of this clinical series show this robotic system performed as intended and all procedures were completed successfully with no conversions to open or laparoscopic surgery. The clinical series that you obtain preoperative imaging to confirm a normal or abnormal renal system. As far as we are aware, there is not a standardized approach to removal of uterine horns. A minimally invasive approach, whether laparoscopic or robotic, should be the standard of care. Although this case was without complications, due to the unpredictability of these anomalies, a skilled surgeon should be involved with the case, especially one who is prepared to deal with a variety of complications. Additionally, we propose that patients with a history of a non-communicating uterine horn resection without entry in the uterine cavity be given the option for a trial of labor, with caution, similar to myomectomies.

**Use of the Da Vinci Sensitive Firefly Imaging System for Transperitoneal Visualization in Gynecologic Surgery**

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Study Objective: First, to introduce the use of Sensitive Firefly in robotic surgery. Second, to compare the efficacy of Firefly (currently in use) to Sensitive Firefly Fluorescence Imaging for ureter identification using the IS-001 (IND 124804) investigational contrast agent.

Design: Prospective, open-label, 2-stage dose escalation clinical trial design.

Setting: Multi-center, academic and academic affiliated community hospitals.

Patients or Participants: Women (n=30) between ages 18 and 75 scheduled to undergo robotic gynecological procedures using a da Vinci® Surgical System with Sensitive Firefly® Fluorescent Imaging.

Interventions: A single IV slow bolus injection of fluorescent dye IS-001 at 2 mg/mL was administered, with intra-operative identification of the ureter compared between white light endoscopy, Firefly®, and Sensitive Firefly Fluorescence Imaging modalities.

Measurements and Main Results: Visualization of the ureter was evaluated both simultaneously and based on a qualitative surgeon rating score using Firefly, Sensitive Firefly with IS-001 versus white light endoscopy. Ureter visibility was measured at the level of the pelvic brim (PB) with a tissue depth of ~0.5 mm, and at the level of the ureteric artery (UA) with an estimated tissue depth of ~2-3 mm: both of which are common sites of ureteral injury during hysterectomy. Measurements were at time intervals of 10, 30, and 60 minutes after IS-001 injection using each modality. Early trial results indicate that Sensitive Firefly’s boosted near-infrared sensitivity facilitated clear IS-001 fluorescent ureter detection at both shallow (PB) and deep (UA) locations. Sensitive Firefly offered a 5-fold improvement in ureter visibility at the deeper ureteric artery location compared to white light endoscopy and a marked benefit compared to the existing Firefly Fluorescent Imaging system.

Conclusion: The use of Sensitive Firefly showed improved transperitoneal IS-001 fluorescent visualization and delineation of the ureter at greater tissue depths and for longer periods of time when compared to the current Firefly Fluorescent Imaging System.

ERAS Implementation in Gynecologic Surgery in a Medically Underserved Publicly Insured and Uninsured Population

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Study Objective: Enhanced recovery after surgery (ERAS) protocols have been shown to improve patient outcomes and reduce post-operative length of stay. In our underserved population, patients experience a high incidence of comorbid conditions, lack adequate insurance, and face many barriers to healthcare that adversely affect health outcomes. We investigated the impact of an ERAS protocol implementation in our publicly insured and uninsured high-risk patient population undergoing gynecologic surgery and assessed hospital length of stay (LOS), 30 day hospital readmission rates, and pain scores.

Design: IRB approval was obtained. Data was abstracted from medical records pre (1/11/18-2/28/19) and post (3/1/19-2/29/20) ERAS implementation. LOS, readmission <30 days, and pain scores were assessed.

Setting: The study took place in an urban hospital setting.

Patients or Participants: Patients undergoing gynecologic surgery during the study period with public insurance/free care were included (N=509).

Interventions: Implementation of ERAS protocol included pre-operative carbohydrate loading, intra-operative euvoolemia, scheduled post-operative nausea and non-opioid pain medications, and early ambulation.

Measurements and Main Results: Implementation of ERAS led to decreased length of stay 1.8 vs 1.43 days (p-value = 0.006); however, when adjusted for potential confounders this was no longer statistically significant. Average pain scores significantly decreased with ERAS implementation 3.06 pre-ERAS vs 2.44 post-ERAS (p-value = 0.005) and this held true when adjusted for potential confounders. Hospital readmission rates did not change significantly with ERAS implementation 8% pre-ERAS vs 10% post-ERAS (p-value = 0.538).

Conclusion: This is the first study to assess the impact of ERAS on our patient population, a diverse and medically underserved population of women undergoing gynecologic surgery. ERAS improved pain scores without adversely affecting hospital length of stay in this population. Our next steps are to better understand the impact of ERAS on opioid use among this patient population as well as assessing its impact on patient satisfaction in this population.

Analysis of Endometriosis Related Hashtags on Instagram

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Study Objective: Instagram is a social media platform that provides education and support for endometriosis patients. The objective of our study was to analyze the authorship and content of Instagram posts utilizing endometriosis related hashtags.

Design: 15 hashtags were identified utilizing the ACOG Endometriosis FAQ and a hashtag finder program. Hashtags included: endometriosis, endo, endowarrior, endometriosisawareness, endosisters, endometriosis-warrior, pelvicpain, chronicpelvicpain, painfullperiod, painlesssex, invisibility, inflammation, fatigue, uterus, hystectomy, and laparoscopy. The authorship and content of the “top 9” and most recent 30 posts were evaluated for each hashtag and categorized by authorship and content. We also analyzed groups of hashtags. Non-English posts were excluded.

Setting: NA

Patients or Participants: NA

Interventions: NA

Measurements and Main Results: 585 posts were analyzed. Authorship: patients (54.2%), health professional (16.2%), for-profit group (9.6%), holistic provider (8.7%), and non-profit group (4.6%). Regarding content: support (33.5%), personal post (21.2%), advertisement (17.8%) and education (13.5%).

Endometriosis specific group: patient (74.8%), for-profit commercial group (6%), holistic provider (5.1%), health professional (3.8%), support (40.6%), personal post related to endometriosis (23.5%), personal post unrelated to endometriosis (20.9%), education (6.4%).

General symptoms group: patient (47.4%), holistic provider (14.1%), for-profit commercial group (12.8%), health professional (2.6%), support (34.6%), advertisement (21.8%), personal post related to diagnosis (20.5%), personal post unrelated to diagnosis (15.4%), education (7.7%).

Pain group: health professional (34%), patient (32.7%), for-profit commercial group (15.4%), holistic provider (12.8%), non-profit organization (4.5%), support (27.6%), education (25.6%), personal post related to diagnosis (10.9%), personal post unrelated to diagnosis (7.1%).

Procedure group: patient (59%), health professional (29.5%), non-profit organization (3.8%), personal post related to diagnosis (42.3%), support
showed similar case decreases (34% resulted in economic and clinical disruption. Other surgical divisions on oncology and minimally invasive surgery activity decreased by 50%. This

Measurements and Main Results: During the study period, gynecologic oncology and minimally invasive surgery activity decreased by 50%. This resulted in economic and clinical disruption. Other surgical divisions showed similar case decreases (34 – 64%) except for otolaryngology which increased by 48%.

Seventy-one surgeries were completed in our practice during the study period. Elective cases were restricted on March 7th. Afterward, indications for surgery were malignancy (43.2%), heavy bleeding (21.6%), and pain (8.1%). All patients were asymptomatic for COVID-19 associated symptoms during preoperative evaluations. Mandatory day-of-surgery COVID-19 PCR testing commenced on April 6th. Prior to this, 49 surgeries were completed. Afterward, 4 of the remaining 21 cases (18%) were cancelled due to positive testing. Of these, 3 tested positive on day of surgery, 1 self-tested positive due to community exposure. All 4 patients remained asymptomatic.

Of the 71 patients, 83% were discharged on the same day or on postoperative day one (POD). Postoperatively, 6 patients reported mild COVID-19 symptoms (cough, fever, shortness of breath). Of these, 1 patient tested negative and 5 were not tested. Additionally, 1 patient tested positive remote from surgery (POD #30). Surgeons tested negative for COVID-19 antibodies, and all office staff were asymptomatic.

Conclusion: Asymptomatic COVID-19 patients were encountered in the preoperative setting. No symptomatic cases of nosocomial COVID-19 infection were identified. Clinical care and surgery appear safe provided there is appropriate utilization of personal protective equipment (PPE). Gynecologic surgical services may be safely performed during a pandemic with appropriate PPE and safety measures.

Effectiveness of Hysteroscopic Morcellation of Endometrial Polyps Compared to Traditional Technique: A Comparison of Disease Recurrence

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Study Objective: To compare the outcomes between hysteroscopic morcellation of endometrial polyps and traditional techniques such as hysteroscopic resection with monopolar or bipolar radiofrequency energy, scissors and graspers or mechanical resection with polyp forceps.

Design: Retrospective chart review.

Setting: Academic tertiary referral center.

Patients or Participants: 193 patients who underwent operative hysterocopic polypectomy between January 2015 and May 2016.

Interventions: Hysteroscopic polypectomy with intrauterine morcellation, monopolar or bipolar radiofrequency energy, scissors and graspers or mechanical resection with polyp forceps with evaluation and/or treatment of recurrent abnormal uterine bleeding (AUB) after operative polypectomy.

Measurements and Main Results: There were 9 patients who underwent hysteroscopic polypectomy with monopolar radiofrequency energy, 3 patients with bipolar radiofrequency energy, 91 patients with intrauterine morcellation, 67 patients with polyp forceps and 12 patients with scissors and graspers. The recurrence rate for AUB for monopolar was 1.89%, bipolar was 1.67%, intrauterine morcellation was 1.93%, polyp forceps was 1.84% and hysteroscopic scissors and/or graspers was 1.83%. Among the recurrences the average time until recurrence was 1162 days for monopolar, 207 days for bipolar, 749.5 days for intrauterine morcellation, 477.6 days for polyp forceps and 341.5 days for hysteroscopic scissors and graspers.

Conclusion: There was no significant difference in terms of recurrence of AUB following the different modalities of operative hysterectomy. Among the patients with recurrence in order of shortest time until recurrence: bipolar, hysteroscopic scissors and graspers, polyp forceps, intrauterine morcellation and monopolar.


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Study Objective: To report on the continuance of gynecologic surgery during the COVID-19 pandemic.

Design: Case series.

Setting: New York City Academic Medical Center.

Patients or Participants: In Mid-March of 2020 there was a moratorium on elective services due to the COVID-19 pandemic. 105 surgeries were completed from March 15-April 30, and those that were emergent and urgent were identified. Essential gynecologic surgical procedures were provided during the COVID-19 pandemic.

Interventions: Peri-operative data were collected retrospectively.

Measurements and Main Results: A total of 45 cases were identified that were emergent and urgent gynecologic surgical procedures during the COVID-19 pandemic in New York City. Average age was 34 years (range 24-68). In our health system, there were 23 emergency gynecologic cases, the most common were ectopic (14), torsion (3), retained products of conception causing hemorrhage (3) or sepsis (1), exploratory laparotomy for post-operative small bowel obstruction (1), and vaginal myomectomy for hemorrhage (1). Pre-operative PCR testing for COVID-19 was available March 31, but emergency cases were not delayed to await test results. Of the emergency cases, 21 (91.3%) were performed with general and 2 (8.7%) with neuraxial anesthesia. There were 21 urgent gynecologic surgical procedures. All surgical procedures recovered in the operating room during this time frame.

Conclusion: Essential gynecologic surgery can feasibly continue during peak pandemic crisis in high prevalence areas, with appropriate safety measures.
Trends in Complications Among Benign Hysterectomy

Patients in Relation to BMI

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Study Objective: To evaluate complication rates and length of stay over time in relation to BMI to assess for improvements in care given the increasing need to take care of obese women.

Design: Retrospective cohort study.

Setting: American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database.

Patients or Participants: Strict criteria were used to include planned benign hysterectomies without confounding concomitant procedures from 2010 to 2018.

Interventions: Chi-squared analysis was used to analyze the relationship between complications (wound, length of stay, readmission, etc) and time stratified by BMI categories using CDC criteria and type of hysterectomy (abdominal, laparoscopic, or vaginal).

Measurements and Main Results: 204,111 hysterectomies met inclusion criteria. Overall length of stay decreased overtime from 1.7 days in 2010-2011 to 1.4 days in 2017-2018 (p<0.01). Abdominal, laparoscopic, and vaginal hysterectomies independently decreased in length of stay overtime (p<0.01). Overall complication rates did not change overtime in comparison with BMI and route of hysterectomy except for women with a BMI >40 undergoing abdominal hysterectomy who had a decrease in overall complication rate from 16.5% in 2010-2012 to 12.5% in 2017-2018 (p=0.01). Prolonged length of stay (greater than 2 days) decreased overtime for normal weight, overweight, and Class 1-3 obese women specifically for abdominal and laparoscopic hysterectomies (p<0.01). There were no differences in readmission rates except for Class 3 obese women undergoing a vaginal hysterectomy (p=0.02). Overall there were no changes in wound complications except for an increase in rate from 1.7% to 2.8% for normal weight women undergoing an abdominal hysterectomy (p<0.01).

Conclusion: Irrespective of hysterectomy type and BMI, length of stay is decreasing without differences in readmission rates. Overall, complications rates do not demonstrate significant change overtime. Further analysis is required to determine if this trend will continue and how outcomes can be improved for obese patients.

Sacrohysterectomy

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Study Objective: To illustrate a modified technique for mesh laparoscopic uterine sparing prolapse repair in a postmenopausal woman who desired uterine preservation.

Design: Surgical video of a modified uterine sparing prolapse repair.

Setting: Large academic medical center.

Patients or Participants: One case of uterine prolapse in a woman that wished to retain her uterus.

Interventions: None.

Measurements and Main Results: A significant percentage of women seeking treatment for pelvic organ prolapse, noted to be between 20-46 percent in the literature, express a desire to preserve their uterus (Koribly et al, 2013). Some patients wish to retain their uterus for cultural reasons or to preserve fertility, while others desire preservation of sexual function (Ridgway, 2015).

Uterine preserving techniques yield minimal blood loss, shorter recovery times and maintain natural pelvic anatomy when compared with repair involving hysterectomy (Meriwether et al., 2018). Historically, uterine conserving prolapse repairs involved attaching mesh from the posterior cervix to the sacral promontory, however this approach significantly limited the ability to correct anterior wall prolapse. Currently, techniques involve attaching mesh to the anterior cervix and upper vaginal wall, tunneling through the broad ligament, fixing the mesh to the posterior cervix and then to the sacral promontory. Compared to the prior techniques with posterior cervical attachment of mesh, these approaches allow for correction of anterior prolapse (Kalish et al., 2019) (Jan et al., 2018). The vascular supply via the utero-ovarian vessels is compromised in many cases by dissection and tunneling through the broad ligament (Kupelian et al., 2016) (Serdenisek et al 2019).

Conclusion: This operative video demonstrates a modification on the mesh uterine sparing prolapse repair that simplifies the procedure and has potential to reduce operative time for women who do not desire fertility.

Cost-Effectiveness Analysis of Tubal Surgery Versus in Vitro Fertilization As Treatment for Tubal infertility

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Study Objective: Surgical management of tubal factor infertility has largely been replaced by in vitro fertilization (IVF). Trainees now have little exposure to surgical techniques such as fimbrioplasty and tubal reanastomosis. This study compares the cost-effectiveness of tubal surgery and IVF for tubal factor infertility. This comprehensive analysis includes costs and probabilities from the infertility treatments themselves to adverse birth outcomes depending on the mode of conception.
Resection of Uterine Septum: Does the Size Matter?

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**Study Objective:** Describe safe technique.

**Design:** Case Report.

**Setting:** Laparoscopic surgery.

**Patients or Participants:** 34 years old with chronic pelvic pain and infertility.

**Interventions:** Endometriosis surgery.

**Measurements and Main Results:** Nowadays, the patient is on her period and she has no pelvic pain or dyspareunia, and she does not take hormone medications since the surgery.

**Conclusion:** The resection of all injuries, preserving the functions of the affected organs, is possible if the appropriate surgical technique is performed, combined with anatomical knowledge and the surgeon’s experience, bringing permanent relief of symptoms and fertility preservation.

Parasitic Leiomyomatosis

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**Study Objective:** The objectives are to provide an overview and case illustration of this condition. Additionally, Food and Drug Administration (FDA) guidance on morcellation in gynecologic surgery is reviewed.

**Design:** This is a case report.

**Setting:** The setting is a community teaching hospital operating room. The patient was initially placed in left lateral decubitus position and then transitioned to dorsal lithotomy position, under general anesthesia.

**Patients or Participants:** The patient is a 42yo G3P2012 with past medical history of longstanding uterine leiomyomas and surgical history significant for three prior myomectomy procedures.

**Interventions:** The patient presented for evaluation of pelvic pain and menometrorrhagia. On work-up, ultrasound imaging revealed a vascularized mass measuring 5.7 x 6.5cm in the left adnexa. MRI imaging revealed a superolateral mass measuring 5.1 x 4.2 cm and a posterosuperior mass measuring 2.6 x 4.3 cm, both along the spleen margin. A joined case with the general surgery department was coordinated. The aforementioned periadsal masses were laparoscopically excised by general surgery. A laparoscopic hysterectomy and excision of the left adnexal mass were next performed. The patient had a stable post-operative course.

**Measurements and Main Results:** The final pathology report revealed benign leiomyomatosa.

**Conclusion:** This condition is a benign sequela of prior myomectomy and/or morcellation, potentially warranting additional surgery for definitive treatment, as seen in this case. When deciding on surgical treatment of leiomyomas, it is important to conduct a pre-operative risk assessment as well as to consider FDA guidance regarding morcellation contraindications and warnings.
Assessing Readability and Quality of Online Patient Directed Information on Hysterectomies

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Study Objective: Hysterectomy is a commonly performed procedure. Accessible online patient information is highly important due to associated risks, implications of the procedure and potential treatment alternatives. The study aims to evaluate quality, comprehensiveness and readability of commonly accessed online patient information on hysterectomies.

Design: We included websites whose purpose was to provide hysterectomy information for patients. The first 25 webpages on 5 search engines were assessed by two reviewers. Quality of websites was assessed by validated tools for online material (DISCERN and JAMA benchmark). We assessed whether the websites included information on alternatives (including minimally invasive approaches), risks, and benefits. Lastly, readability scores were calculated using standardized tools to assess the grade level or years of education needed to comprehend the material (FKLG, Gunning FOG, SMOG, FRES).

Setting: N/A

Patients or Participants: Women seeking online information on hysterectomy to inform their treatment choices.

Interventions: Hysterectomy (On-line patient information).

Measurements and Main Results: Forty-seven websites were included according to our selection strategy. On average, websites were of good quality (53.2 ± 10.7 of 80, DISCERN criteria; 2.8 ± 1.2 of 4, JAMA criteria). The majority of websites described alternatives to hysterectomy (33/47, 70.2%) including minimally invasive options (21/47, 44.7%), and also described surgical risks (36/47, 76.6%) and benefits (46/47, 97.9%). However, website article readability corresponded to a grade 12 reading level (FKLG= 11.9 ± 2.3) or reading levels of 11 or 15 years of education (SMOG= 11.1 ± 1.7, Gunning FOG= 14.9 ± 2.4) suggesting these websites are difficult to read for the general population (40.7 ± 12.0 FRES).

Conclusion: Online patient information on hysterectomy is overall of good quality and contains the majority of the required information. However, the content is more difficult to read than the American Medical Association’s recommendation for a grade six level. Website content creators should consider readability to make the content more accessible to patients.

Genetic Aspects of Myoma: From Somatic Mutations to the Markers of Development

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Study Objective: to identify gene markers that influence the development of uterine myoma in patients with family history of this disease and multiple forms of myoma.


Setting: V.I. Kulakov National Medical Research Center of Obstetrics, Gynecology and Perinatology.

Patients or Participants: 215 patients scheduled for hysterectomy or myomectomy were organized into 3 groups: group 1 with family history of myoma, group 2 without such family history, group 3 — patients with no information about their anamnesis. 30 women were included in the control group.

Interventions: Collection of blood samples and tissue of the myomatous nodules in studied patients was undertaken. DNA isolation was carried out; genotyping of the obtained material was conducted at six loci (rs3020434, rs11742635, rs124576744, rs12637801, rs2861221, rs17677069) of the ESR1, FBN2, CELF4, KCWMB2 genes.

Measurements and Main Results: Rare alleles of polymorphisms rs3020434 (TT), rs11742635 (TT), rs2861221 (GG) and rs17677069 (GG) were not found in the group of women with a family history. These women, however, had common forms of the following polymorphisms: CC allele of rs3020434 polymorphism, seen in 73 % of patients, GG variant of rs11742635 observed in 82 %, CC allele of rs2861221, and AA allele of rs17677069 identified in 82 % of women with familial predisposition of uterine myoma. Interestingly, homozygosity in CC allele of rs12637801 was observed in 83.5% of women with multiple myoma and may potentially become a marker for this form of the disease.

Conclusion: Rare alleles of rs3020434, rs11742635, rs2861221 and rs17677069 polymorphisms can be protective variants against the development of familial forms of uterine myoma. The homozygous variant of CC of rs12637801 can be a predictor of the development of multiple uterine fibroids in a single patient.

Surgical Correction and Rehabilitation of Patients with Congenital Uterovaginal Anomalies and Concomitant Genital Endometriosis

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Study Objective: To evaluate the results of surgical treatment and rehabilitation in patients with uterovaginal anomalies and concomitant external genital endometriosis.

Design: Prospective cohort study. Level II-1.


Patients or Participants: Since 2013 to 2019 we examined 198 patients with various uterovaginal anomalies. The 1st group included 105 patients with concomitant endometriosis, the 2d consisted of 93 patients without endometriosis.

Interventions: Surgical treatment of uterovaginal anomalies was made according to the anatomical type of malformation, clinical manifestations and reproductive outcomes. In cases with concomitant endometriosis we made excision and coagulation of endometriotic lesions.

Measurements and Main Results: The prevalence of primary infertility was significantly higher in 1st group - 55.5%, compared with the 2d group - 25.3% (p = 0.0057). The index of dysmenorrhea was significantly higher in 1-st group - 53.3%, compared with the control group -36, 6% (p = 0.0179). The frequency of external genital endometriosis was 53%. In 20% of patients with aplasia of the uterus and vagina without functional rudimental horns endometriotic lesions were visualized on pelvic peritoneum.

Conclusion: The laparoscopy revealed no significant differences in the incidence of endometriosis among patients with and without outflow obstruction of menstrual blood. Sampson’s theory of retrograde menstruation doesn’t explain the development of endometriosis in all patients with...
Expression of PiRNA in Tissues of Ovarian Endometriosis Cysts

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Study Objective: To identify the expression of PIWI associated RNA (piRNA) in tissues of endometrium and endometrioid ovarian cysts and to evaluate differences in the expression of piRNA between eutopic and ectopic endometrium.

Design: Prospective observational cohort study; Level II-1.


Patients or Participants: The study included 21 patients of reproductive age (30.27 ± 3.78 years) with endometrioid ovarian cysts. Paired samples of endometrial tissues were collected during surgery in the proliferative phase of menstrual cycle. Tissue samples for further analysis were selected after histological examination. The analysis of piRNA expression was carried out by the new generation sequencing on the Illumina platform, followed by processing of the data by bioinformatics analysis.

Interventions: Laparoscopic surgery for endometrioid ovarian cysts and endometrial biopsy followed by histopathologic and piRNA expression analysis of obtained tissue.

Measurements and Main Results: According to the sequencing data, 197 piRNA were identified in the tissues of the eutopic endometrium and endometrioid ovarian cysts. The analysis of differential expression revealed predominantly reduced expression of piRNA in the ectopic endometrium relative to the eutopic endometrium. In total 30 differentially expressed piRNA were identified, including 4 with increased and 26 with reduced expression. Using bioinformatic methods, possible gene targets of differentially expressed piRNA were found. Functional analysis of potential targets of differentially expressed piRNA revealed signaling pathways and cellular processes that may contribute to the development of endometriosis.

Conclusion: The data obtained suggest that alterations in piRNA expression of ectopic endometrium and subsequent disturbances in the expression of their target genes may be significant link in our search for the pathogenesis of endometriosis.

Mass Spectrometry in Prediction of the Myomas Recurrence

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Study Objective: The mass spectrometric study of changes in the lipid profile of various tissues in patients with recurrent fibroids and the use of mass spectrometric data in the prediction of myoma recurrence.

Design: Level II-1, Canadian Task Force.

Setting: National Medical Research Center, Moscow, Russia.

Patients or Participants: Lipid analysis of the myometrium, fibroids, and plasma was conducted in 66 patients: 35 patients with newly diagnosed uterine fibroids (UF) and 31 patients with recurrent myoma (RUF). Plasma only was studied in the control group of 15 patients who underwent intrauterine septum resection.

A semi-quantitative assessment of tissue lipid levels was performed using direct mass spectrometry. A semi-quantitative assessment of blood plasma lipidome was conducted. The suitability of biomarkers for diagnostics was assessed.

Interventions: Laparoscopic myomectomy, followed by lipid analysis of obtained samples of myometrium, fibroids, and plasma.

Measurements and Main Results: Significant differences were found in the levels of lipids involved in the metabolism of glycerophospholipids, sphingolipids, triglycerides, fatty acids when studying uterine fibroids. Studying of the myometrium identified the difference in the levels of lipids involved in the metabolism of glycerophospholipids, lipids with an ether bond, and sphingolipids. In patients with recurrent disease, linoleic acid metabolism was altered in the tissues of the fibroids and not in the myometrium.

Significant differences were found in the levels of cholesterol esters, triacylglycerols, (lyso) phosphatidylcholines, and sphingomyelins when comparing the plasma of the control group with the plasma of the UF and RUF groups.

When comparing plasma of groups UF and RUF, lipids belonging to the classes of cholesterol esters, phosphatidylcholines, sphingomyelins, triacylglycerols were identified as significant.

Conclusion: A broad, diagnostically significant panel of potential serologic biomarkers for the diagnosis of recurrent myoma was identified in this study.
17th AAGL International Congress on Minimally Invasive Gynecologic Surgery

SEPTEMBER 23-26, 2021

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Email: dr.ptrivedi@gmail.com
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