AGL 2022

51st GLOBAL CONGRESS ON MIGS

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SYLLABUS

ROBO-607: Advanced Robotics Course for Laparoscopic Surgeons

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The following members of AAGL have been involved in the educational planning and/or review of this course (listed in alphabetical order by last name).

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FACULTY DISCLOSURE

The following have agreed to provide verbal disclosure of their relationships prior to their presentations. They have also agreed to support their presentations and clinical recommendations with the "best available evidence" from medical literature (in alphabetical order by last name). Noah A. Goldman, MD*
Jin Hee Kim, MD*
Jenna Z. Marcus, MD – Consultant and Speakers Bureau: GSK
Eirwen Miller, MD*
Khara Simpson, MD*

ROBO-607: Advanced Robotics Course for Laparoscopic Surgeons

Chair: *Jenna Z. Marcus, MD, Jin Hee Kim, MD*

Faculty: *Noah A. Goldman, MD, Eirwen M. Miller, MD, Khara Simpson, MD*

Course Description

This course will offer surgeons with minimally invasive experience the opportunity to refine their skills and technique in both robotic assisted and traditional laparoscopic surgery. The course will be designed to help surgeons facilitate a plan for difficult cases with respect to patient anatomy, obesity, techniques for abdominal entry and specimen extraction. Faculty will address dissection in the retroperitoneum, opening and identifying spaces, vital structures and landmarks. Faculty will also explore dissection to identify and trace the ureter and techniques to identify it in patients who are morbidly obese or have complex pathology utilizing new techniques such as injection of indocyanine green. This course applies to the global AAGL audience and offers techniques aimed to promote safe and successful minimally invasive surgery.

Learning Objectives

At the conclusion of this course, the participant will be able to: 1) Apply a systematic approach to complex pelvic surgical cases; 2) Develop a strategy to tackle difficult cases with respect to patient anatomy, obesity, techniques for abdominal entry and specimen extraction; and 3) Apply techniques to mitigate challenging clinical situations while maintaining a minimally invasive approach.

Course Outline

9:45 am	Welcome, Introduction and Course Overview	J.Z. Marcus/J.H. Kim
9:50 am	Planning the Procedure Start to Finish; Entry and Extraction, Obesity	J.Z. Marcus
10:15 am	Approaching the Obliterated Anterior Cul De Sac & The Large Uteri	J.H. Kim
10:40 am	Robot-assisted Laparoscopic Myomectomy: Pushing the Envelope	K. Simpson
11:05 am	Approaching the Obliterated Posterior Cul De Sac: Reviewing the Retroperitoneum & Ureteral Identification Strategies and Keeping Them Safe	E.M. Miller
11:30 am	Complications	N.A. Goldman
11:55 am	Questions & Answers	All Faculty
12:15 pm	Adjourn	

Northwestern Medicine
Feinberg School of Medicine

Planning the procedure start to finish; entry and extraction, obesity

Jenna Z. Marcus, MD
Gynecologic Oncology
Feinberg School of Medicine at
Northwestern University

Objectives

- Review surgical considerations in:
  - The obese patient
  - The patient with a large pelvic mass
- Discuss port placement and anatomic landmarks
- Review approaching abdominal entry
- Specimen extraction

Northwestern Medicine
Feinberg School of Medicine

Abdominal Entry

Northwestern Medicine
Feinberg School of Medicine

Abdominal Wall Anatomy

...and additional considerations

- Layers
  - Skin (Langer's lines)
  - Subcutaneous tissue
    - Camper's fascia (superficial)
    - Scarpa's fascia (deep)
  - Muscles
    - Rectus abdominus
    - External oblique
    - Internal oblique
    - Transversus abdominus
    - Pyramidalis
  - Fascia
    - Rectus sheath
    - Transversalis fascia
  - Peritoneum

Northwestern Medicine
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Abdominal Wall Anatomy

...and additional considerations

- Vasculature
  - 5 ligaments/folds in anterior wall
    - Middle umbilical ligament (1)
    - Medial umbilical ligaments (2)
    - Lateral umbilical ligaments (2)
      - Inferior epigastric vessels

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Abdominal Wall Anatomy

...and additional considerations

- Nerves
  - Intercostal n. : 7-12th innervate abdominal wall
  - Iliohypogastric n. = 12th intercostal + 1st lumbar (2cm medial, 1cm inferior ASIS)
  - Ilioinguinal n. = 1st + 2nd lumbar n. (3cm medial, 4cm inferior ASIS)
  - Genitofemoral n. = 1st + 2nd lumbar n. (round ligament, psoas m.)
  - Lateral femoral cutaneous n. = 2nd + 3rd lumbar n.

Northwestern Medicine
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Techniques for entry

- Choice of surgical site
  - Surgical history
  - Use of mesh
- Mode of entry
  - Open (Hasson, cut down)
  - Closed (Veress, Direct visualization)
- During the procedure
  - Foley
  - Orogastric tube to suction

Pros and Cons for Entry

OPEN

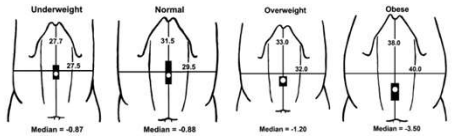
- **Pro**
  - View all layers
- **Con**
  - Takes time
  - Larger defect to close

CLOSED

- **Pro**
  - Fast entry
  - Smaller defect
  - View all layers (direct visualization)
- **Con**
  - Increased vascular complications (Veress)

Obese patients

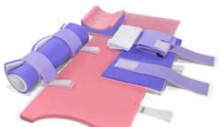
- Use bony landmarks



Ambardar, et al. Surg Endosc 2009

Port Placement

Positioning the patient



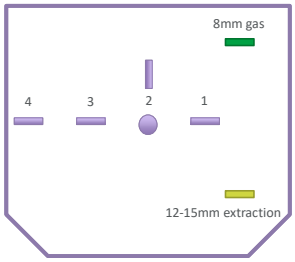
- Dorsal lithotomy
  - Allen stirrups
  - Arms tucked @ sides
- Padding
  - Proper padding of extremities to prevent nerve injury
- Use of anti-sliding devices during steep positioning

Port Placement

- Xi robot – 4 arms
  - 8mm trocars
  - Camera has ability to hop ports
  - Each arm should be a minimum of 6cm and a maximum of 8cm distance between each other
  - Additional ports for a pneumoperitoneum maintaining device +/- specimen extraction

Port Placement

1 - bipolar device
2 - camera
3 - monopolar scissors
4 - grasper



Extraction

Extraction of masses

- Adnexal masses 20% cases
- Safe
- Similar or improved outcomes
  - Operating time
  - Pain
  - Blood loss
- Spill should be minimized, ESPECIALLY when malignancy is suspected

Extraction of masses

- Abdominal
  - Bagging device and manual extraction
  - Bagging device and needle decompression
  - Extension of midline incision
- Vaginal
  - Colpotomy with drainage/aspiration
- Suspicious mass
  - Never intentionally aspirated or morcellated

Thank You

JOHNS HOPKINS MEDICINE

Presented by:
Khara Simpson MD
Minimally Invasive GYN
Johns Hopkins Hospital

Robotic Myomectomy

Disclosures

- None

Objectives

- To discuss preoperative and intraoperative ways to optimize myomectomy
  - Imaging
  - Preventing anemia
- To review ways to optimize intraoperative efficiency including trainee involvement
- To discuss new market technologies

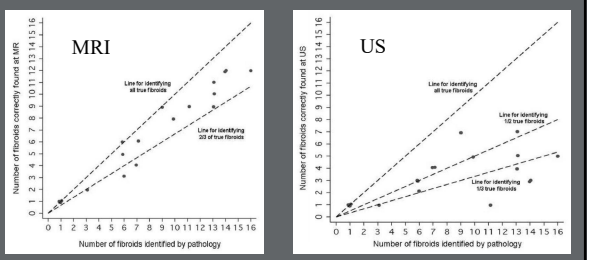
Steps to a Successful Myomectomy

- 1. Identify & remove all myomas
- 2. Perform all procedures via MIS
- 3. Reduce need for blood transfusion
- 4. Avoid cavity entry
- 5. Optimizing fertility outcomes
- 6. Prevent or reduce fibroid recurrence

Step 1 – Identify & Remove ALL myomas

- Choose your imaging
  - TVUS
  - **MRI**
  - 3D reconstruction imaging

MRI & TVUS Fibroid Burden Determination

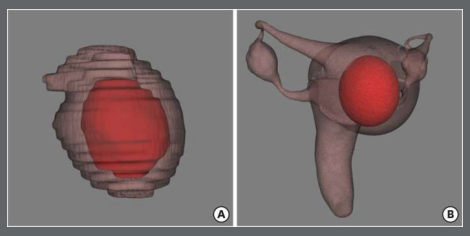


MRI Sensitivity 80%; TVUS Sensitivity 40%

Standardize MRI Reporting

- Total fibroid estimate (number)
- Measurements
  - 3 largest fibroids
  - 3 submucosal myomas
- FIGO Typing
- Insert Example

Step 1 – Remove ALL fibroids 3D MRI Reconstruction



3D MRI Reconstruction

- Barriers
  - Time
  - Cost
  - Limited evidence

Intuitive Tile-Pro

- Insert Image

Intraoperative Ultrasound

- Insert Surgery U Video

Intraoperative Efficiency

- Docking
  - Pros of the left side
- Simplified technique
  - Single blade
  - Identify myoma
  - Extend incision
  - Dissect
  - Remove
- Timed Trainee involvement
- Insert photo of right vs left docking during myoma removal

Four Step Myomectomy Enucleation

- Insert video

Fibroid Tagging

- Insert Video
- Insert Photo

Step 2 – Perform all procedures via MIS

- Identify a theoretic cut off based on:
  - Surgeon experience
  - Patient variables
    - Previous surgery
    - BMI
    - Fertility desires
  - Surgical environment
    - Academic , Private, Hybrid
- Multidisciplinary Conference

Simpson Stats A Tale of 6 Years

- Insert (1 & 5 year data re RA mmx)
  - Number of mmx performed per year
  - Open vs MIS vs robotic
  - Median number of fibroids removed
  - Consider patient factors

Considerations

- Abdominal vs pelvic docking
- Insert abdominal view

Single port and reduced port Myomectomy

Step 3-
Reduce blood transfusion

- Preoperative
  - Menstrual Suppression
  - Iron
  - GnRH agonists
  - UAE with gelfoam
- Intraoperative
  - Vasopressin
  - TXA
  - Vessel clips
  - Uterine tourniquette
  - Cell salvage
  - Misoprostol

Step 4-
Avoid cavity entry

- Insert video re uterine cavity distention with methylene blue

To close or not to close… the endometrial cavity that is

- Limited data to guide management
- If closing the endometrial cavity, consider
  - 3-0 Vicryl (historical)
  - 3-0 or 4-0 barbed suture
- Data on optimal technique for endometrial cavity closure

Risk of Intrauterine Adhesions following myomectomy

Intrauterine adhesion formation 3-26%

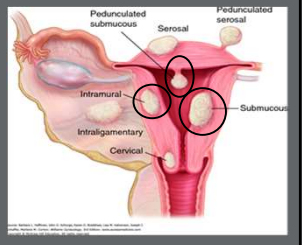
- Risk factors
  - Hysteroscopic myomectomy
  - ? Fibroids >10 cm
  - > 5 Fibroids removed
  - NOT associated with cavity entry

Risk of Intrauterine Adhesions following myomectomy

- Considerations
  - Use of a uterine manipulator
  - Type of suture for myometrial closure
    - Barbed vs non-barbed suture
  - Endometrial cavity closure

Step 5
Optimize Fertility

- Fibroids are the sole cause of infertility in 1-2% of cases
- Submucosal and intramural fibroids (cavity distorting) are associated with:
  - Higher rates of infertility
  - Higher rates of miscarriage
  - Reduced implantation rates during in vitro fertilization



Fibroids and Pregnancy

- Fibroids can increase in size during pregnancy
- Fibroids can cause complications in 10-40% of pregnancies:
  - Pain
  - Preterm labor
  - Malpresentation
  - Placental complications
  - Cesarean section
  - Postpartum hemorrhage
- Up to 80% of fibroids decrease in size following pregnancy

Guo et al 2012

Subsequent Conception and Pregnancy

- Time to conception
  - 3-6 months?
- Uterine rupture
  - <1% Risk of rupture
    - Multi-layer closure
    - Minimize use of electrocautery

Seracchioli et al, Fertil Steril, 2006. Buckley et al, JMIG, 2015.

Pregnancy Outcomes following Robotic Myomectomy

- Pitter et al, 2013.
  - 872 women undergoing robotic myomectomy between 10/2005 – 11/2010
    - 107 women conceived
    - 127 pregnancies
    - 92 deliveries
  - Results:
    - Mean age at myomectomy 34.8 ± 4.5yrs
    - Mean # of myomas removed 3.9 ± 3.2
    - Mean myoma size 7.5 ± 3.0cm
    - Mean myoma weight 191.7 ± 144.8g

Pitter, et al, Human Repro, 2013.

Pregnancy outcomes following Robotic Myomectomy

Pregnancy / Delivery Characteristics	% N = 127	95% CI
ART	39.4	32.6, 46.7
Multiples	9.8	5.0, 17.8
Spontaneous AB	18.9	13.0, 26.6
Preterm delivery (<35wks)	17.4*	10.9, 26.5
Uterine rupture	1.1*	0.3, 4.7

* N = 92

- 20% entry into cavity
- Time to conception 12.9 ±11.5 months
- Avg GA at delivery 36.6 ± 2.6 weeks

Pitter, et al, Human Repro, 2013.

Post myomectomy Surveillance

- Biannual ultrasound
- Consider office hysteroscopy prior to conception following:
  - Hysteroscopic myomectomy
  - Cavity entry
  - Multiple myomectomy cases
  - Infertility

Step 6- Reduce or prevent recurrence

- Risk factors for fibroid recurrence:
  - >5 myomas
  - Lack of parity
  - Fibroid retention
  - Young age

Fibroid Recurrence

Time since Myomectomy	Recurrence Rate	ReOperation Rate
5 years	53%	7%
8 years	84%	16%

Yoo et al, JMIG, 2007. Buckley et al, JMIG, 2015.

Steps to a Successful Myomectomy

- 1. Identify & remove all myomas
- 2. Perform all procedures via MIS
- 3. Reduce need for blood transfusion
- 4. Avoid cavity entry
- 5. Optimizing fertility outcomes
- 6. Prevent or reduce fibroid recurrence

Thank you!

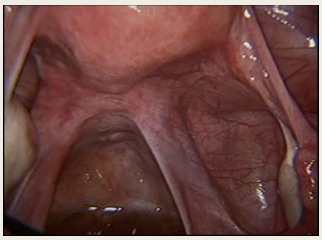
APPROACHING THE OBLITERATED CUL-DE-SAC

Eirwen M. Miller, MD
Gynecologic Oncology
Allegheny Health Network

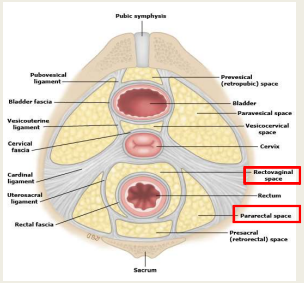
Outline

- Anatomic Considerations
- "Typical" posterior hysterectomy
- Approaching the obliterated cul-de-sac
  - *"Top-Down"*
  - *"Bottom-Up"*

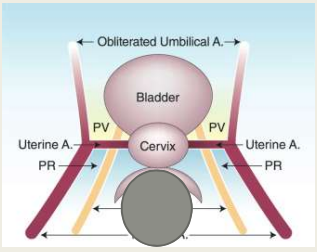
"THE REALM"



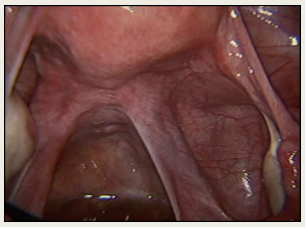
Avascular Planes



Critical Structures



- Ureters
- Rectum
- Uterine vessels

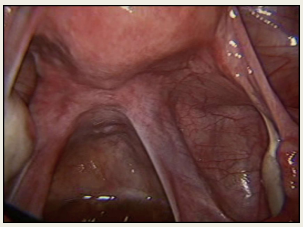


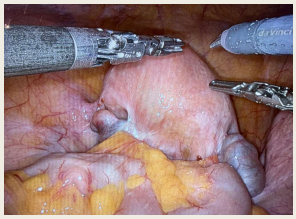
"TYPICAL" HYSTERECTOMY

Protecting the Realm

Protecting the Realm

- Medial leaf of the broad ligament
  - *Incision will lateralize the ureters*
- Rectovaginal septum
  - *Incision along the posterior colpotomy cup will drop the uterosacral ligaments and the rectum*
- Lateral colpotomy cup
  - *Ligation of the uterine vessels at this site will lateralize the ureters*





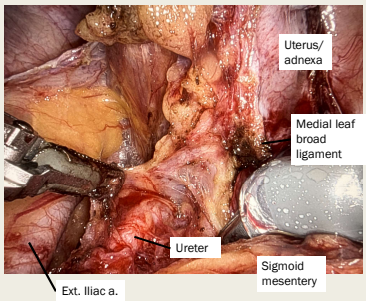
APPROACHING THE OBLITERATED CUL-DE-SAC

How Do I Protect the Realm?

- Can't access the medial leaf of the broad ligament
- Can't visualize the posterior colpotomy cup
- Can't access the uterine vessels at the internal cervical os

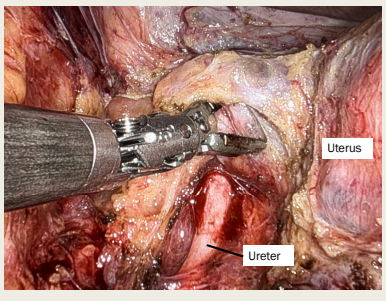
Ureter

- *Retroperitoneal dissection*
- Develop para-rectal space

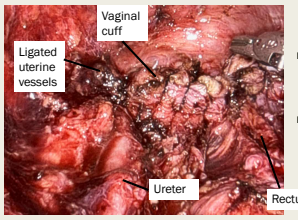


Ureter

- *Retroperitoneal dissection*
- Develop para-rectal space
- Ureterolysis
  - Dissect along the **medial/superior** ureter
  - Mobilize ureter from the pelvic sidewall peritoneum
- Incise the peritoneum freely from pelvic sidewall to midline/rectum



Uterine Vessels



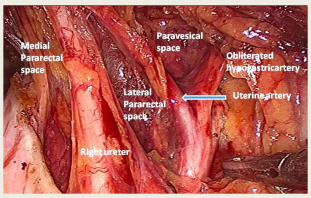
- When accessible, ligate at the internal cervical os
- Alternatively, ligate uterine vessels laterally

Rectum – 2 Approaches

"Top-Down"

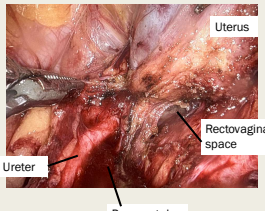
"Bottom-Up"

"Bottom-Up" - Retroperitoneal



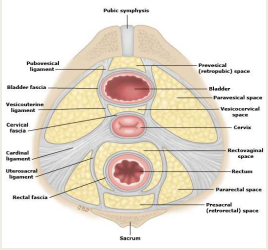
- Develop the para-rectal space
- Mobilize ureter off the pelvic sidewall peritoneum

"Bottom-Up" – Retroperitoneal



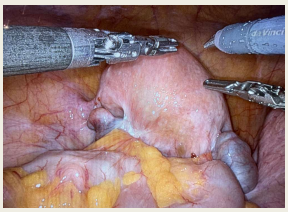
- Develop the para-rectal space
- Mobilize ureter off the pelvic sidewall peritoneum
- Bluntly develop the rectovaginal space

"Bottom-Up" – Retroperitoneal



- Develop the para-rectal space
- Mobilize ureter off the pelvic sidewall peritoneum
- Bluntly develop the rectovaginal space
- Join the para-rectal space with the rectovaginal space
  - *Divide the mesorectal fat and uterosacral ligament*

"Bottom-Up" – Retroperitoneal

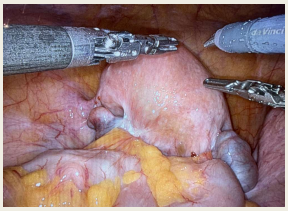


- Develop the para-rectal space
- Mobilize ureter off the pelvic sidewall peritoneum
- Join the para-rectal space with the rectovaginal space
- Bluntly develop the rectovaginal space
- Bottom up – dissect the overlying rectum off the posterior uterine body

"Top-Down" – Intraperitoneal

Defining Good vs. Evil

"Top-Down" – Intraperitoneal



EEA Sizers

"Top-Down" – Intraperitoneal

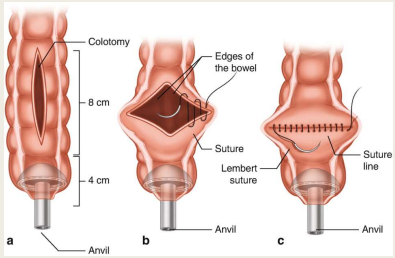
Did I hurt anything?

"Top-Down" – Intraperitoneal

- Diagnosing rectal injury
  - *Flexible sigmoidoscopy*
  - *Bubble test*

Repairing the rectum

- Don't stricture the lumen
  - *Close the defect perpendicular to the axis of the lumen*
- Tension free
- 2 layers
  - *Mucosa to mucosa*
  - *Lembert imbricating layer*
- 3-0 vicryl, tapered needle
- Running or interrupted



Questions?

Avoiding Complications in Minimally-Invasive Surgery

Noah A. Goldman, MD, MBA
Medical Director of Cancer Programs
Penn Medicine – Princeton Medical Center
Plainsboro, NJ

Disclosure

I have no financial relationships to disclose

Objectives

After the completion of this lecture, the audience member will be able to :

1. Understand the etiology of urinary, bowel, and vascular injuries and how to avoid them.
2. Recognize a urinary, bowel, or vascular injury and begin the process of repairing such an injury.
3. Understand which hemostatic agents are available and how to use them.

Genitourinary Injuries

- Genitourinary injuries are most common injuries during hysterectomy
- Ureteral injuries are one of the most serious complications in gynecology
- Most injuries are unrecognized
  - increased morbidity
  - ureterovaginal fistula
  - loss of renal function

Rate of Bladder Injury

	Abdominal Hysterectomy	Vaginal Hysterectomy	Laparoscopic Hysterectomy
Donnez, O *et al.* (2009)[1]	0.73%	0.44%	0.31%
Brummer, T *et al.* (2011)[2]	0.9%	0.6%	1%
Adelman *et al.* (2014)[3]	—	—	0.05% - 0.66%

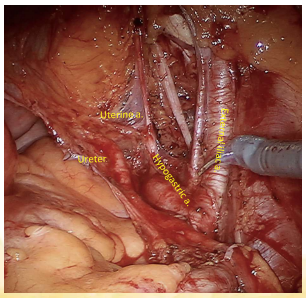
1. BJOG 2009; 116:492
2. Hum Reprod 2011; 26:1741
3. JMIG 2014; 21:558

Rate of Ureteral Injury

	Abdominal Hysterectomy	Vaginal Hysterectomy	Laparoscopic Hysterectomy
Donnez, O *et al.*[1] (2009)	—	0.33%	0.25%
Brummer, T *et al.*[2] (2011)	0.3%	0.04%	0.3%
Adelman *et al.*[3] (2014)	—	—	0.02-0.4%

1. BJOG 2009; 116:492
2. Hum Reprod 2011; 26:1741
3. JMIG 2014; 21:558

Pelvic Anatomy

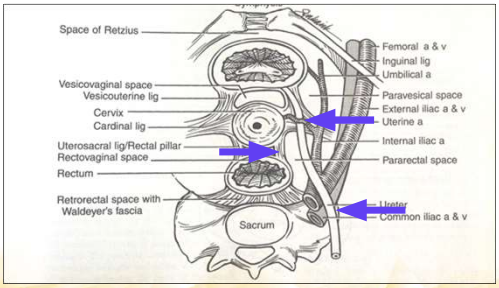


- Pelvic ureter is 13 cm - 15 cm in length
- Enters pelvis by crossing common iliac bifurcation
- Passes under the uterine artery ~1.5 cm - 2 cm from internal os

Types of Ureteral Injuries

- Transection
  - Scissor
  - Linear stapler
  - Vessel Sealing Device (VSD)
- Kinking
- Thermal
  - Electrocautery
  - Laser

Location of Injuries



Sequelae from Genitourinary Injury[3]

- Vesicovaginal Fistula = 3.4%
- Ureterovaginal Fistula = 2.4%
- Require Ureteral Stent = 11.8%
- Require ≥ 1 surgery = 19.7%

Risk Factors

- Previous C-section
  OR (cystotomy) = 3.38 - 7.50[3]
  >3 C-sections = 20% cystotomy rate[4]
- Previous laparotomy
  OR (cystotomy) = 4.69[1]
- Endometriosis
- Adhesive disease
- Fibroids
- Low volume surgeons
- VSDs

Risk Factors

VSDs (Trivedi *et al.*)[5]

~900 TLH performed at a single institution evaluated GU injury before acquiring VSD and after

- 390 cases before VSD = 0 genitourinary injuries
- 502 cases after VSD = 4 ureter / 2 bladder injuries

CONCLUSION:
Surgeons may have overconfidence during initial use

Excitement → Euphoria → Overconfidence → Troubles → Solutions

Prevention

- Primary Prevention
- Secondary Prevention (IntraOp)
- Tertiary Prevention (PostOp)

Primary Prevention

DON'T DO IT!!!

Primary Prevention

- Know anatomy
- Address patient-specific risk factors
- Proper exposure
- Proper technique

Recognition of Injury[3]

- Overall Rate = 51.1% - 87.4%
- Bladder Injury = 45.2% - 85.4%
- Ureteral Injury = 3.7% - 12%

Secondary Prevention

- Assess for injury intraoperatively
  - Bladder
    - Air in Foley bag
    - Methylene Blue/sterile Milk retrograde
    - Cystoscopy
  - Ureter
    - Cystoscopy (+/- stent)
    - IV Indigo Carmine
    - Retrograde pyelogram

Cystoscopy?

Vakili *et al.*[6]

- 471 patients (TAH/VH/TLH)
- Intraop recognition (before cysto)
  - Bladder = 53%
  - Ureter = 12.5%
- 96% of injuries were recognized with cysto
- 6 ureteral injuries in TAH had ureteral peristalsis

Cystoscopy?

Ibeneau *et al.*[7]

- 839 patients
- Intraop recognition (before cysto)
  - Bladder = 37.5%
  - Ureter = 6.7%
- 97% of injuries were recognized with cysto
- 21 cases had sluggish/absent efflux with no injury
- Transection (40%) and Kinking (40%) at the level of the uterine artery

Cystoscopy?

AAGL Statement[8]

"…surgeons and institutions should consider routine implementation of cystoscopy at the time of TLH."

- Decreased morbidity and improved outcome
- 80% - 90% of ureteral injuries were detected

To Stent, Or Not To Stent….?

Retrospective[9]
3071 patients

Rate of Ureteral Injury		
	Stent	No Stent
ELAP	0.62% (2/322)	0.1% (2/2016)
LSC	0 (0/147)	0 (0/586)

Prospective/Randomized[10]
3141 patients

Rate of Ureteral Injury		
	Stent	No Stent
LSC	1.2%	1.09%

Tertiary Prevention

- Symptoms
  - Abdominal pain/distention
  - Oliguria
- Labs
  - serum Cr bump = 0.8 mg/dl
- Testing
  - CT urogram
  - Retrograde pyelogram

Repair

- Most bladder injuries can be repaired laparoscopically.
- Ureteral injuries depend on location
  - within 5 cm of UVJ = ureteroneocystotomy
  - below pelvic brim = ureteroneocystotomy with psoas hitch or Boari flap
  - above pelvic brim = uretero-ureterostomy or diversion

Incidence

- Bowel injuries at the time of laparoscopy are typically rare
  - Incidence 1/769 (0.13%)
  - Range 1/3333 to 1/256 (0.03% to 0.39%)

Why do we care?

- Bowel injury is associated with high morbidity and mortality rates.
- Delayed diagnosis of bowel injury at the time of laparoscopy is associated with a mortality rate as high as 21%.
- Laparoscopic bowel injury is a significant cause of litigation in the United States.

Incidence of Bowel Injury by Procedure

- Laparoscopic Hyst (benign) 0.39%
- Laparoscopic Hyst (malignant) 0.41%
- Laparoscopic myomectomy 0.03%
- Diagnostic procedures 0.07%

Location of Bowel Injuries

- Small intestine 46.9%
- Large intestine 29.9%
- Rectum 18%
- Stomach 6%

Cause of Bowel Injury

- Veress needle, trocar 54.9%
- Electrosurgery or laser 28.7%
- Surgical dissection or LOA 11.5%
- Other (Clips, suction, etc) 0.3%

Delay in Diagnosis

- Delayed diagnosis: 41%
- Median time to diagnosis: 3 days
- Range in time to diagnosis: 1 to 13 days

Presenting Signs and Symptoms

- Peritonitis
- Abdominal pain
- Fever
- Abdominal distension

Mortality

- Typically occurs with delayed diagnosis
  - 1/125 (0.8%)
- In large analysis there were no deaths reported with intra-operatively recognized bowel injury

Entry Techniques

- Veress Needle
- Direct Trocar Entry
- Hasson Open Entry
- Optical Trocar Entry

Open vs Closed Technique

- Most studies comparing visceral injury to open and closed techniques show no difference in injury rate.
  - Open technique may lead to less cases of delayed diagnosis for those bowel injuries related to entry
- Most global professional surgical societies endorse that the preferred technique should be the surgeons preference.

Avoiding Laparoscopic Bowel Injury

- Detailed surgical history and careful physical exam noting all abdominal incisions
- Choose entry technique that you are most comfortable with
  - Prepare for multiple entry possibilities
- Ensure proper positioning and instrumentation

Avoiding Laparoscopic Bowel Injury

- Take the time to run and inspect the entire small and large intestine at entry or at anytime during operative dissection.
- Keep operative instruments in your sight at all times
  - This includes replacement at the time of both laparoscopic and robotic surgery
- Limit the use of electrosurgery, especially when completing an extensive lysis of adhesions.
- In instances of significant pelvic adhesive disease or endometriosis using a rectal delineator is imperative.

Suspected Rectal Injury

- Keep a high index of suspicion with difficult dissections
- Utilize proctoscopy or colonoscopy and insufflation underwater to look for air leaks
- Rectal installation of dilute methylene blue in saline may aid in detecting rectal injuries as well

Fixing Injuries

- Enterotomy (less than 1 cm)
  - Laparoscopic repair with multiple layer closer using delayed absorbable suture and/or silk
  - Laparoscopic linear stapler
- Enterotomy (greater than 1 cm)
  - Small bowel resection with functional end-to-end anastomosis utilizing flexible wound retractor and mini-laparotomy.

Fixing Injuries

- Rectal Injuries
  - Size does not matter
  - Location does matter
  - Clinical situation does matter
- Primary, multiple layer closure
- Primary, multiple layer closure with diverting ileostomy

Fixing Injuries

- Always consider a minimally invasive repair if technically feasible
- Do not hesitate to convert to laparotomy if necessary
- Do not hesitate to call for help if you need it

Why Talk About Vascular Injuries

Potentially fatal for patients

Traumatic for the surgeon and surgical team

Typically a sentinel event that will be reviewed by hospital and/or department QA committee

Often legal ramifications

Incidence of Major Vascular Injury

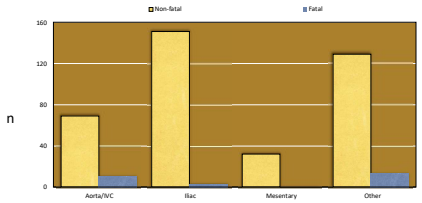
Author	Year	n	Incidence per 10,000	Mortality
Deziel	1993	77,604	5	8%
Sigman	1993	1,028	10	0
Saville	1995	3,951	10	0
Geers	1996	2,201	14	0
Champault	1996	103,852	5	13%
Hashizume	1997	15,422	6	0
Usal	1998	2,589	8	0
Schafer	2002	14,243	8	17%
Roviaro	2002	3,545	6	0

Major Vascular Injury

- Overall Incidence 0.05% to 0.14%
  - Mortality of ~10%
- Vascular injuries have been described with all types and brands of laparoscopic trocars
- Some association with surgeon experience
- Technical errors account for the majority of the cases
- >50% of major vascular injuries occur during insertion of the primary or ancillary trocars
  - Majority of injuries occur in women who are obese (30%)
- Distance from umbilicus to aorta = 2 cm

Hurd WW, Obstet Gynecol 80(1):48, 1992
Hanney RM, Surg Endosc 13(12):1238, 1999

Major Vascular Injury During Trocar Insertion

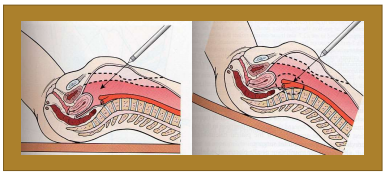


FDA - Medical Device Reports, 1993-1996

Root Causes: Technical Errors

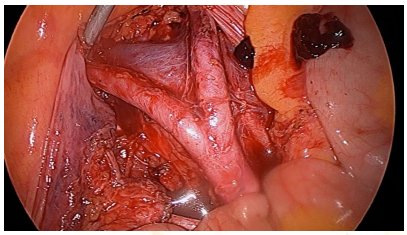
- Inadequate skin incision
- Failure to recognize anatomy
- Improper patient positioning
- Failure to stabilize the abdominal wall
- Forceful thrusting on insertion of trocar
- Perpendicular or lateral insertion of the needle or trocar
- Failure to control the depth of penetration

Setting The Stage: Caution



Complications of Gynecologic Endoscopic Surgery. Keith Isaacson. 2006

Beware the Common Iliac Veins!



Recognition of Vascular Injury

- Occasionally vascular injuries are difficult to recognize
  - Any bleeding noted after trocar placement should be promptly investigated
- Sudden deterioration of the patient's vital signs after placement of the insufflation needle or a trocar should be considered a catastrophic vascular injury until proven otherwise

Management of Vascular Injury

- All patients undergoing laparoscopy should have an active type and screen
- Do not panic! Take a deep breath, but act quickly
- Communicate
- Call for the laparotomy equipment
- Call for help if needed (gynecologic oncology, vascular surgery, general surgery)
- Use the laparoscopic equipment to begin applying pressure and controlling the bleeding point

Management of Vascular Injury

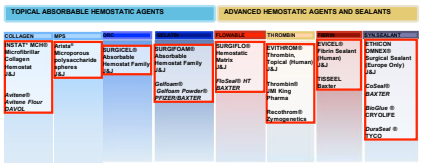
- Apply pressure with suction device or 4x4 sponge
- Be cognizant of the surrounding anatomy
- Utilize bipolar or other graspers to control bleeding point
  - Use caution grasping the injury, especially if it is venous as this may make the injury worse
- Be patient if bleeding is improving
- Assess the ability to suture or apply hemoclips in order to repair the injury
- Consider use of available hemostatic agents

Never feel bad about just opening

Hemostatic Agent Selection and Use

- Patient factors
  - Coagulation/Platelet status
  - Ability to receive blood products
- Characteristics of bleeding site
  - Bleeding characteristics
  - Tissue type
  - Site characteristics
- Characteristics of hemostatic agent
  - Mechanism of action
  - Material properties
- Preparation and application technique

Hemostatic Agents Available



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3. Adelman, MR *et al. JMIG.* 2014;21:558
4. Wang *et al. JMIG.* 2010;17:186
5. Trivedi, P *et al.* J Gynecol Endosc Surg. 2009;1:83-8
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CULTURAL AND LINGUISTIC COMPETENCY & IMPLICIT BIAS

The California Medical Association (CMA) announced new standards for Cultural Linguistic Competency and Implicit Bias in CME. The goal of the standards is to support the role of accredited CME in advancing diversity, health equity, and inclusion in healthcare. These standards are relevant to ACCME-accredited, CMA-accredited, and jointly accredited providers located in California. AAGL is ACCME-accredited and headquartered in California.

CMA developed the standards in response to California legislation (Business and Professions (B&P) Code Section 2190.1), which directs CMA to draft a set of standards for the inclusion of cultural and linguistic competency (CLC) and implicit bias (IB) in accredited CME.

The standards are intended to support CME providers in meeting the expectations of the legislation. CME provider organizations physically located in California and accredited by CMA CME or ACCME, as well as jointly accredited providers whose target audience includes physicians, are expected to meet these expectations beginning January 1, 2022. AAGL has been proactively adopting processes that meet and often exceed the required expectations of the legislation.

CMA CME offers a variety of resources and tools to help providers meet the standards and successfully incorporate CLC & IB into their CME activities, including FAQ, definitions, a planning worksheet, and best practices. These resources are available on the CLC and IB standards page on the CMA website.

Important Definitions:

Cultural and Linguistic Competency (CLC) – The ability and readiness of health care providers and organizations to humbly and respectfully demonstrate, effectively communicate, and tailor delivery of care to patients with diverse values, beliefs, identities and behaviors, in order to meet social, cultural and linguistic needs as they relate to patient health.

Implicit Bias (IB) – The attitudes, stereotypes and feelings, either positive or negative, that affect our understanding, actions and decisions without conscious knowledge or control. Implicit bias is a universal phenomenon. When negative, implicit bias often contributes to unequal treatment and disparities in diagnosis, treatment decisions, levels of care and health care outcomes of people based on race, ethnicity, gender identity, sexual orientation, age, disability and other characteristics.

Diversity – Having many different forms, types or ideas; showing variety. Demographic diversity can mean a group composed of people of different genders, races/ethnicities, cultures, religions, physical abilities, sexual orientations or preferences, ages, etc.

Direct links to AB1195 (CLC), AB241 (IB), and the B&P Code 2190.1:

Bill Text – AB-1195 Continuing education: cultural and linguistic competency.
Bill Text – AB-241 Implicit bias: continuing education: requirements.
Business and Professions (B&P) Code Section 2190.1

CLC & IB Online Resources:

Diversity-Wheel-as-used-at-Johns-Hopkins-University-12.png (850×839) (researchgate.net)
Cultural Competence In Health and Human Services | NPIN (cdc.gov)
Cultural Competency – The Office of Minority Health (hhs.gov)
Implicit Bias, Microaggressions, and Stereotypes Resources | NEA
Unconscious Bias Resources | diversity.ucsf.edu
Act, Communicating, Implicit Bias (racialequitytools.org)
https://kirwaninstitute.osu.edu/implicit-bias-training
https://www.uptodate.com/contents/racial-and-ethnic-disparities-in-obstetric-and-gynecologic-care-and-role-of-implicitbiases
https://www.contemporaryobgyn.net/view/overcoming-racism-and-unconscious-bias-in-ob-gyn
https://pubmed.ncbi.nlm.nih.gov/34016820/