Hollow Viscus Injuries in Gynecologic Surgery

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Learning Objectives

- Apply intraoperative techniques to prevent hollow viscus injury
- Identify approaches to diagnosing intraoperative damage to hollow viscus of the abdomen
- Describe appropriate approaches to managing intraoperative damage to surrounding organs
Hollow Viscus Injuries

- Vessels
- Bladder
- Bowel
- Ureters
Hollow Viscus Injuries

- Intraoperative Damage
  - TVH
  - Laparoscopy
  - Laparotomy

- Postoperative Identification
  - Bladder
  - Bowel
  - Ureters
Vaginal Hysterectomy Challenges and Organ Injury

- Bladder, Bowel, Ureters
- Preferred Approach if Possible
- Visibility Can be Difficult
- Experience is Key
Open Abdominal Surgery Challenges and Organ Injury

- Bladder, Bowel, Ureters
- Often Large Uterus or Ovary
- Many with Multiple Previous Surgeries
- Possibly Distorted Anatomy
Laparoscopy Challenges
Organ Injury

- Bladder, Bowel, Ureters
- Blind Entry
- Inability to Palpate
PREVENTION
The Best Approach to Managing

- Ureters
- Bladder
- Bowel
Avoiding Ureteral Injury

- Look for ureters early to get a trajectory
- Mobilize the bladder
- Skeletonize the uterine arteries
- Ureterolysis / ureteral stenting
- Myomectomy
Trajectory of the Ureter
Ureterolysis

- Enter Retroperitoneum
- Develop Pararectal Space
- Identify Ureter at Medial Leaf of Broad Ligament (At Common Iliac Artery)
- Dissect Free From Medial Leaf
- Dissect Parallel Along Ureter
Ureterolysis
Recognition

- Routine cystoscopy for “at risk” procedures
- Sodium fluorescein (25 mg of 10% soln)
- Ureteral stenting
  - (selective)
Difficult Dissection at Level of Bladder

• Fill Bladder with Fluid to Evaluate Contour

• Allow Foley to Curl in Bladder
  • Tape Foley to Leg to Prevent Tension
  • Use 10cc of Fluid at Bulb
Passive Filling of Bladder
Filling Bladder to Prevent Damage
EEA Sizer to Determine Course of Rectum or Sigmoid Colon
EEA Sizer in Rectum
Proof of an Injury

- Bladder: Fill bladder with fluid
- Bowel: Fluid in Pelvis, Air in Rectum
- Ureter: IV Dye or Retrograde Dye
Asepto for Air in Rectum
Intraoperative Recognition

• Vaginal Hysterectomy and Bladder Damage
  • Happens to Everyone
  • Visualization Likely
  • May Require Filling Bladder with Fluid
  • ABOVE Trigone
Site of Bladder Damage at Vaginal Hysterectomy
While performing a TVH, you notice a gush of yellow fluid.
• While performing a TVH, you notice a gush of yellow fluid.
• OR
• During a TAH or TLH you visualize the rubber of a Foley catheter.
GU Tract Injury: Incidence

- Bladder Injury: 0.6 to 1%
- Ureter Injury: 0.04 to 0.3%
- With Bladder or ureter injury, the fistula rate is 2.4 to 3.4%
Injury Prevention

- Anticipate risks: C-section
- Fill with fluid
- Enter at first vaginal rugae on vaginal hysterectomy.
- Sharp dissection / scissor spread
- Selective ureteral dissection
- Stenting is not usually helpful
Stay out of no-man’s land
Remember the Supravaginal Septum
Bladder Damage at TVH

- Identify Defect Entirely
- Remove Specimen
- Close in 2-3 Layers with Absorbable Suture
- Fluid in Bladder to assure Water Tight
- Cystoscopy
- Foley 10 -14 Days
Bladder Damage at TAH/TLH

- Typically at Dome (Non-dependent)
- If Dependent Site; Call Urology
- Close in 2-3 Layers with Absorbable Suture
- Fill Bladder with 300cc Fluid
- Foley (4-7 Days, Non-dependent) or (10-14 Days if Dependent)
- If Verres needle only; Likely no Repair Necessary
During a TLH, you notice this…
Foley Bag with CO$_2$
Two Layered Bladder Closure
Intraoperative Bowel Injury

- Vaginal Hysterectomy
  - Call General Surgery
- Exploratory Laparotomy
  - Call General Surgery
  - Place Stitch or Remain at Site
  - Many Nuances to Repair
Intraoperative Bowel Injury

• Laparoscopy
  • Call General Surgery
  • Do Not Remove Verres/Trocar
  • If Verres; Need for Repair Unlikely
  • Mark with Stitch or Do Not Leave Site
  • Must Run Bowel for Multiple Perforations
  • Laparotomy OK, but General Surgery may Not Require
Intraoperative Ureteral Injury

- Crush or Strangulation
  - Call Urology; Potentially Stent Only
- Small Defect (1-5mm)
  - Call Urology; Repair and Stent
- Large Defect
  - Below Pelvic Brim
    - Ureteroneocystostomy and Stent
  - Above Pelvic Brim
    - Ureteroureterostomy and Stent
Ureteral Injury


- Intraoperative identification is NOT always possible.
- Intraoperative identification is preferable.
- Early recognition decreased subsequent morbidity
Ureteral Injury

- Gynecologic surgery carries inherent risk to ureteral injury (proximity, visualization)
- Risks:
  - Endometriosis
  - C-Section
  - Low-volume surgeons (<10 hyst / yr)
  - Tobacco use
Hollow Viscus Injury Radiated Field or Thermal Injury

- Previously Described Techniques Do Not Always Apply
- Call Urology, General Surgery or Gynecologic Oncology
Hollow Viscus Injuries in Gynecologic Surgery

- **Bladder** (especially non-dependent site)
  - Identify Entire Defect
  - May Not Require Repair
  - OB/GYN Repair

- **Bowel**
  - Identify Entire Defect
  - Call General Surgery

- **Ureter**: Call Urology