Prevention of Surgical Injuries in Gynecology

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Overview

Review anatomy, etiology, intraoperative, postoperative management, prevention of injuries to:
1. Urinary tract
2. Gastrointestinal tract
3. Neurologic system
4. Hematologic system
Prevention of Surgical Injuries

Urinary tract - ureter

Facts – 75% occur in gyn surgery
  0.4 – 2.5% in benign surgeries
  10% of medico-legal claims; 20% settled

Anatomy – 30cm / retroperitoneal / right 1cm longer
  Abdominal – anterior of psoas muscle,
    Right - lateral of IVC
    Left - posterior sigmoid colon, cross iliacs
  Pelvic – crossed by IP, posterolateral to pelvic wall, passes under uterine artery,
    Tunnels in cardinal ligament 1.5 cm lateral to cervix to enter bladder base
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Urinary tract - ureter

Anatomy –
Blood supply – abdominal vs. pelvic
  superiorly – renal, ovarian
  medially – aorta, common iliac
  pelvic – uterine, vaginal, mid
  hemorrhoidal, vesicle arteries

“When dissecting, handle gently, and stay outside adventitial sheath” (blood supply)

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Urinary tract - ureter

• Risk factors
  • Endometriosis
  • Large ovarian mass
  • Pelvic inflammatory disease
  • Previous pelvic surgery
  • Broad ligament fibroids
  • Previous radiation
  – Most have no identifiable factors (>50%)

“There are two things I respect more than cancer…bad PID and endometriosis”

M. Berman
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Urinary tract - ureter

Intraperitoneal mass  retroperitoneal  intraligament

Types of operative trauma
- crush, ligation, transection,
- angulation, ischemia, resection

Location of injury
- junction with ovarian vessels,
- lateral pelvic sidewall, cardinal ligament, above uterosacral ligaments
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Urinary tract - ureter

Location of injury – next to infundibulopelvic ligament pelvic sidewall

Chan et al, AJOG 2003

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Urinary tract - ureter

Most common –
lowest 3 cm between uterine vessels and bladder

Chan et al, AJOG 2003
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Urinary tract - ureter

Other procedures
- Vaginal hysterectomy
- RPU / Burch procedures
- Ureter injured near UVJ
- Trauma near internal cervical os and vaginal fornices as it enters into trigone
- Laparoscopy – endometriosis
  - thickening of uterosacral ligament
- Bleeding in broad ligament during C/S hysterectomy

Chan et al, AJOG 2003
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**Urinary tract - ureter**

Prevention in vaginal surgery
palpate ureter against
pubic arch or retractor

Bipolar to ureters 12
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Prevention

- adequate exposure
- identify its path and regions of susceptibility
- open peritoneum lateral to IP
- Identify medial leaf of peritoneum
- peristalsis and characteristic snap
- Studies show that preoperative IVP and ureteral stents did not decrease injuries

Sequelae of injury

- resolution, renal atrophy, ureteral necrosis or stenosis, urine extravasation, uremia
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Urinary tract - bladder

- Prevention of bladder injury
- Develop bladder flap high
- Sharp rather than blunt dissection
- Free bladder below cervix
- Common injury sites:
  - Dome (near UVJ)
  - Trigone (vaginal cuff)
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Urinary tract - bladder

• Difficulty in identification of bladder flap
  – Consider posterior cul-de-sac approach to incise bladder peritoneum

• Repair of bladder injury
  – Carefully delineate margins of the wound
  – Start closure slightly beyond the poles of the defect
  – Closure may be interrupted or continuous
  – Use 2-0 or 3-0 suture
  – Two layer closure acceptable
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**Cystotomy and Repair**

- Consider evaluating ureteral integrity via cystoscopy
- Retrograde filling of bladder with 2 way foley

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**Prevention of Surgical Injuries**

*To prevent injury – Know Retroperitoneal Anatomy*

- Advantages
  - Three-Dimensional Anatomical landmarks
  - Knowledge of the pelvic organs to each other decreases injury
    - Pelvic Vasculature
    - Ureter/Bladder
    - Sacral Nerve Roots
    - Rectum
  - Endometriosis does not distort the true retroperitoneal spaces
  - Ovarian cancer rarely distorts the retroperitoneal spaces
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Retroperitoneal Avascular Planes & Spaces

- Prevesical Space
  (Retropubic Space of Retzius)
- Vesicovaginal Space
- Paravesical Space
- Pararectal Space
- Cardinal ligament
  - Divides the paravesical & pararectal spaces
  - Uterine artery medial along superficial portion
- Rectovaginal Space
- Presacral Space

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Anatomy

Risk factors
- Prior surgeries
- Endometriosis
- Inflammatory bowel disease

GI tract - Retroperitoneal Colon

Ascending Colon

Descending Colon

Rectum
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GI tract – blood supply

Intraoperative management
- Repair longitudinal injuries in transverse plain
- Interrupted double layer closure – 3-0 silk
- Avoid narrowing lumen
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GI tract injuries

- Postoperative diagnosis
  - Acute abdominal series
    - Free air under diaphragm
  - CT Scan
    - Free air intraperitoneal cavity

- Bowel resection and reanastomosis
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**GI tract injury**

- Other etiologies

- Thermal damage
  - <5 mm – oversew
  - >5mm - resect
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- Exposure
- Careful dissection of adhesions
- Sharp dissection
- Develop surgical planes
- Anatomical landmarks

Laparoscopic GI tract injury 11
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Neurologic injury

- Femoral nerve anatomy
  - Lateral border of psoas along iliacus muscle
  - Beneath ingunal ligmt

- Etiology
  - Self-retaining retractors
    - Direct & indirect

- Etiology
  - Entrapment & angulation under the unyielding inguinal ligmt during lithotomy position
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Neurologic injury

- Prevention
  - Proper placement of retractors
  - Blades cradle the rectus muscle without psoas compression
  - Folded laparotomy sponge to protect pelvic sidewall
  - Short blades
  - Replacement periodically
  - Limit flexion in lithotomy

Clincial Treatment

Postoperative Femoral Neuropathy

Radiologic Studies
- (CT, MRI, Ultrasound)
- Consider surgical exploration

Suspect hematoma, foreign body, or nerve transection

Retractor injury

Motor Deficit
- Neurology consultation
- EMG studies
- Physical Therapy
  - Assess lesion level
  - Consider chronic nerve abnormalities
  - Stretching exercises
  - Muscle stimulation
  - Strengthening activity
  - Knee-ankle foot orthosis

Sensory Deficit
- (Numbness / tingling)
- Avoid postures that worsen nerve compression
- Prevent further injury from sensory deficit
- Neurology consultation if symptoms persist for >5 days
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**Neurologic injury**

- Obturator nerve

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**Neurologic injury**

- Sensory
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**Neurologic injury**

- Motor
  - Femoral - quadripceps – leg drop; unable to extend leg
  - Obturator – loss of thigh adduction
  - Sciatic – loss of thigh and leg extension
  - Tibial – loss of foot flexion
  - Peroneal – foot drop

**Hematologic injury**

Anatomy
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Hematologic injury

Anatomy of inferior epigastric

Hemorrhagic Complications Of Operative Laparoscopy
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16 year old, R ext. iliac perforation with monopolar

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Hematologic injury

• Treatment of vascular injuries

Figure 78-2. The defect is held closed with vascular patches and then a hemostatic clip is applied.
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Hematologic injury

- Prevention
- Adequate exposure
  - Self retaining retractors
- Identify vasculature retroperitoneal
- Sharp dissection
  - Blunt increases venous plexus injury
- Avoid large vascular pedicles
- Needles at tip of clamp
- Ligatures for vascular pedicles should not be held

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**SURGICAL PRINCIPLES FOR PROTECTION OF PELVIC ORGANS**

Before surgical entry
- Bowel Preparation
- Positioning in universal stirrups
- Draping for abdominal and vaginal access
- Bladder drainage
- Examination under anesthesia

After surgical entry
- Adequate exposure of surgical field
- Adequate light within surgical field
- Adequate suction for surgical field
- Restoration of anatomic relationships
- Traction and countertraction to expose adjacent structures
- Dissection of extraperitoneal "spaces"
- Dissection along tissue planes
- Maintaining hemostasis
- Clamping, cutting, and suturing under direct vision
- Avoidance of mass ligation of tissues
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