MANAGEMENT OF URETERAL INJURIES IN GYNAECOLOGICAL SURGERIES

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INCIDENCE

- 0.5% — 1.5%

- Hysterectomy (54%), Colorectal surgery (14%), pelvic procedures such as ovarian tumor removal (8%), Transabdominal urethropexy (8%), and Abdominal vascular surgery (6%).
• 0.5% (experienced surgeons) & 14% (inexperienced surgeons) after laparoscopic hysterectomy.

• Electro surgical or laser-assisted lysis of endometriosis

  • (1) Endometrioma can involve the ureter either extrinsically or intrinsically;

  • (2) Intraperitoneal adhesion, making ureteral visualization difficult

  • (3) Disease can deviate the ureters medially
SUBTLE
SUSPICION
MECHANISM

- Intraoperative suture ligation,
- Sharp incision and transection,
- Avulsion,
- Devascularization, and
- Heat (e.g., microwave, electrocautery, or vibratory energy) or freezing (cryoablation) energies can produce ureteral damage.
ANATOMY

- Retroperitoneal, easily displaced when peritoneum is lifted up,
- Relation in ovarian fossa
- Relation with uterine artery
- Vascular supply
Subdivisions and contents of the broad ligament

- Anterior
  - External iliac vessels
  - Ampulla of uterine tube
  - Round ligament
  - Laminae of the mesosalpinx
  - Obliterated umbilical artery
  - Ovarian branches of uterine vessels
  - Round ligament
  - Transverse vesical fold
  - Vesicouterine (uterovesical) pouch

- Posterior
  - Suspensory ligament of the ovary (containing the ovarian vessels)
  - Infundibulum of uterine tube
  - Fimbriae of uterine tube
  - Right ovary
  - Right ureter
  - Laminae of the mesovarium
  - Posterior lamina of broad ligament
  - Anterior lamina of broad ligament
  - Uterine artery and venous plexus
  - Vaginal artery
AVOIDANCE

- Preoperative stenting
- Fiberoptic stents with illumination
COMPLICATIONS POST OPERATIVE

- Urinoma,
- Abscess,
- Ureteral stricture,
- Urinary fistula, and
- potential loss of an ipsilateral renal unit.
PRESENTATION

- Anuria,
- Urogenital fistula,
- Persistent pain or fever,
- Urinary leakage from the wound, hydrenephrosis, and hematuria
- Fever, leukocytosis, and generalized peritoneal signs—missed Ureteral injury.
DIAGNOSIS—IMAGING STUDIES

- Excretory Urography
- Computed Tomography
- Retrograde Ureterography
- Antegrade Ureterography
TIMING OF REPAIR

• Immediate repair—72 hours,

• After 3-day period—drained with stent, percutaneous nephrostomy, or both,

• Definitive repair is delayed until 6 weeks after injury.
UPPER
Direct ureteroureterostomy
Transureteroureterostomy

MIDDLE
Direct ureteroureterostomy
Transureteroureterostomy

LOWER
Reimplantation
Psoas hitch
LIGATION

- Removal of the ligature and observation of the ureter for viability.
- Ureteroureterostomy or Ureteral Reimplantation
- Ureteral stent
PARTIAL TRANSECTION

- A longitudinal laceration into a transverse one so as not to narrow the ureteral lumen.
- Repeat retroperitonealized if possible.
- An internal stent and retroperitoneal drain are always placed.
TRANSECTION

• Immediate Recognition— Ureteroureterostomy

• Delayed Recognition—

  • [1] Double-J ureteral stent (5% to 50% success, Spontaneous healing 0%-75%)

  • [2] Percutaneous nephrostomy
Ureteroneocystostomy

Distal ureter

- A long, nontunneled, spatulated, stented anastomosis.
PSOAS BLADDER HITCH

- Lower third of the ureter
- Bladder is opened and secured to the psoas muscle.
BOARI FLAP

- Lower two thirds of the ureter with long ureteral defects.
- A pedicle of bladder is swung cephalad and tubularized to bridge the gap.
Intraoperative recognition

Minor ureteral injury
- Deligate as necessary Stent

Major ureteral injury
- Primary stented ureteroureterostomy, psoas hitch, or Boari flap with or without kidney mobilization

Ureteral stent 6 weeks

Follow-up retrograde pyelography and stent removal or replacement as needed

Success
- After stent removal consider periodic Lasix renogram or surveillance ultrasound (detect hydronephrosis) to rule out recurrence

Fail
- Consider endoscopic methods (laser, Acusize, balloon)
  - Primary stented ureteroureterostomy, psoas hitch, or Boari flap with or without kidney mobilization, autotransplant or ileal ureter

Consider damage control and postoperative placement of percutaneous nephrostomy in rare case of extremely long injury
Postoperative recognition

CT with contrast (+ delayed films) ± retrograde pyelography

- **Minor ureteral injury**
  - Ureteral stent 6 weeks
  - Follow-up retrograde pyelography and stent removal or replacement as needed
    - Success
      - After stent removal consider periodic Lasix renogram or surveillance ultrasound (detect hydronephrosis) to rule out recurrence
    - Fail
      - Consider endoscopic methods (laser, Acusize, balloon)
      - Primary stented ureteroureterostomy, psoas hitch, or Boari flap with or without kidney mobilization
      - Consider autotransplant or ileal loop in rare case of extremely long injury

- **Major ureteral injury**
  - Attempted retrograde stent placement
    - Success
      - Percutaneous nephrostomy and anterograde stent placement, if possible
    - Fail
      - Fail, wait 6 weeks