

Bladder injury in laparoscopic gynecological surgery

Outline

- Common risk factors of urinary tract injury at laparoscopy
- Strategy to prevent injury
- Recognition and repair of the injury
- Further management



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Complication rate of laparoscopic

- The overall rate of major complications following a **laparoscopic procedure** is approximately 1.4 per 1,000 cases.
 - gastrointestinal (0.6 per 1,000 cases)
 - urological (0.3 per 1,000 cases)
 - vascular (0.1 per 1,000 cases)
 - omental injuries (0.4%)

Krishnakumar S, Tambe P. Entry complications in laparoscopic surgery. J Gynecol Endosc Surg. 2009;1(1):4-11

- incidence of urinary bladder injury varies between **0.2%** (diagnostic laparoscopies) and up to **8%** (operative laparoscopies)

What

- Urinary tract injury 0.18% whole gyn op
- 0.33% for laparoscopic surgery

Why

- LAVH
- Complexity of OP
- **Distorted pelvic anatomy**
- DR Experience

When

- Port entry (Suprapubic port)
- Dissection
- Direct involvement

- * 50-80% of all surgical complications involving the lower urinary tract are associated with gyn surgery
- * Reported Urinary bladder injury rate varies from 0.02% -- 8.3%

The potential for injury is increased when there is a **distortion** of the normal anatomy

Box 1. Risk factors for urinary tract injury due to distorted pelvic anatomy

- Endometriosis
- Cancer
- Adhesions (previous surgery/infection/inflammatory disease/radiation)
- Severe genital organ prolapse
- Obesity
- Pregnant uterus

Strategy to prevent

- Inserted 2nd trocar under direct view
- Empty bladder prior to peritoneal insufflation and insertion of trocars

Kyung MS, Choi JS, Lee JH, Jung US, Lee KW. Laparoscopic management of complications in gynecologic laparoscopic surgery: a 5-year experience in a single center. *J Minim Invasive Gynecol* 2008;15:689–94.

- **Difficult case :**
 - filling the bladder with saline with dye-stained fluid 200-300ml to see direct vision of the border

Wohlrab KJ, Sung VW, Rardin CR. Management of laparoscopic bladder injuries. *J Minim Invasive Gynecol* 2011;18:4–8.

- LAVH
 - major laparoscopic dissection, closure under laparoscope
 - major vaginal dissection, vaginal closure

Kadar N, Lemmerling L. Urinary tract injuries during laparoscopically assisted hysterectomy: causes and prevention.

Am J Obstet Gynecol. 1994;170(1 Pt 1):47-48.

Identification of the bladder injury

Unidentified bladder injury

- renal damage
- voiding dysfunction
- detrusor instability
- recurrent UTI
- urogenital fistula

Identify

- Direct visualization of urine leakage
- Hematuria/ distended catheter bag due to air leakage
- Retrograde instillation of dye-fluid into the bladder (200-300 ml)
- Cystoscope

* 50% of the bladder injury remain unrecognized during the primary operation.

Post-operative Identification

- Clinical evidence:
 - ① Recovery not as expected
 - ② Suprapubic pain
 - ③ Hematuria
 - ④ Leakage of urine per vagina and oliguria
- Chemical peritonitis (**uoperitoneum**):
 - Sterile urine does irritate the peritoneum, present with diffuse abdominal pain, distension and ileus.
 - Symptoms and signs usually appear within the **first 48 hours** post-operatively
 - * **Thermal injuries** present after 10–14 days with uoperitoneum or vesicogenital fistula.

Management of the bladder injury

two-layer interrupted stitches

- two-layer interrupted stitches with 2.0 or 3.0 absorbable suture : Vicryl and PDS

Further management

- Watertight closure
- Retrograde Cystoscope
- Indwelling foley catheter placement for 2 weeks

- Trigone injury repair should avoid obstructing the ureter and urethra, suggest performed by urologist.
- Despite this measures, still a 5% incidence of fistula formation

Post-operative Management

- Indwelling foley catheter placement for **2 weeks**
- **x- ray cystography** to ensure complete closure of the repair without contrast extravasation before catheter removal.
 - Anterior-posterior and oblique films should be obtained for complete bladder evaluation
 - If contrast extravasation either vaginal or into the abdominal cavity , repeating cystography no sooner than 1 week later. Continuous drainage should be maintained until a negative cystogram can be confirmed.
- Injuries not recognized at the time of initial surgery should first undergo a trial of conservative therapy before surgical re-exploration is considered
 - clinical practice guidelines now recommend against the use of prophylactic antibiotics
- Patients were monitored 3 months after the surgery
 - urine analysis and voiding symptoms were evaluated.