Technical Aspects of Cystoscopy for the General Gynecologist

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Learning Objectives

• Discuss the role of cystoscopy in gynecologic surgery
• Describe technical aspects of cystourethroscopy
• Differentiate distention media and dye agents
Indications

Diagnostic
• Evaluation due to symptomatology
• Rule out bladder, ureteral or urethral trauma intraoperatively
• Staging for gynecologic malignancy

Operative
• Tumors
• Stent placement

Therapeutic
• Injection
  (Intravesical, urethral)
Complications

- Rarely minor pain
- Small risk of post operative urinary tract infection
- Rare perforation of urethra or bladder
- Risk of not recognizing injury e.g. delayed or non-obstructive injuries
• Indicated during midurethral sling placement and high uterosacral ligament suspension
• Rule out intravesical placement of mesh
• Verify ureteral patency

ACOG COMMITTEE OPINION

The Role of Cystourethroscopy in the Generalist Obstetrician–Gynecologist Practice

ABSTRACT: Cystourethroscopy can be performed for diagnostic and a few operative indications by obstetrician–gynecologists to help improve patient care. Perhaps the most important indications for cystourethroscopy are to rule out cystotomy and intravesical or intraurethral suture or mesh placement and to verify bilateral ureteral patency during or after certain gynecologic surgical procedures. The granting of privileges for cystourethroscopy and other urogynecologic procedures should be based on training, experience, and demonstrated competence. Postgraduate education, including residency training programs in obstetrics and gynecology and continuing medical education, should include education in the instrumentation, technique, and evaluation of findings of cystourethroscopy, and in the pathophysiology of diseases of the lower urinary tract.
“Routine cystoscopic evaluation should be carried out after total laparoscopic hysterectomies”
Urinary tract injury

- All types of gynecological surgery 0.2-15 per 1000 cases
- Injuries more common with TLH vs TAH and TVH

- Analysis of 62,379 hysterectomies in Finland 1990-1995 (Härkki-Sirén)
- 115,000 hysterectomies (Gilmour)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Bladder injuries/1000 Cases</th>
<th>Ureteral injuries/1000 Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total laparoscopic hysterectomy</td>
<td>8.9</td>
<td>13.9</td>
</tr>
<tr>
<td>Total laparotomic hysterectomy</td>
<td>1.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Supracervical laparotomic hysterectomy</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Total vaginal hysterectomy</td>
<td>0.2</td>
<td>0.2</td>
</tr>
</tbody>
</table>
eVALuate study

- 2 parallel, randomized controlled trials
- LH vs. TAH and LH vs TVH

Table 2

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Bladder injuries/1000 Cases</th>
<th>Ureteral injuries/1000 Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laparoscopic vs laparotomic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laparoscopic (n = 584)</td>
<td>21.0(^{a})</td>
<td>9.0(^{a})</td>
</tr>
<tr>
<td>Laparotomic (n = 292)</td>
<td>10.0</td>
<td>0</td>
</tr>
<tr>
<td>Laparoscopic vs vaginal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laparoscopic (n = 336)</td>
<td>9.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Vaginal (n = 168)</td>
<td>12.0</td>
<td>0</td>
</tr>
</tbody>
</table>

\(^{a}\) \(p = .09\) for any urinary tract injury, laparoscopic vs laparotomic.
Systematic Review and Meta-Analysis

• Rates of urinary tract injury detected during and after benign gynecologic surgery

• Intra-op detected rates of ureteric and bladder injuries were higher with routine intraoperative cystoscopy

• 79 studies
Results

- Ureteric injury rate 0.3 %
- Bladder injury rate 0.8 %
- Proportion of ureteric and bladder injuries detected intra-op without routine cystoscopy 18 % and 79 %
- Detection rate increases to 95 % if intraoperative cystoscopy is used

Teeluckdharry et al, Obstet Gynecol 2015;126:1163-9
Conclusion

• Fivefold increase in injury detection rates when routinely using intra-op cystoscopy

• Not significant effect on postoperative injury detection rate

Teeluckdharry et al, Obstet Gynecol 2015;126:1163-9
Support for Selective Cystoscopy

- 1982 patients who underwent hysterectomy
- 251 (12.6%) had cystoscopy
- 14 bladder and 5 ureteral injuries none detected (either normal cysto or omitted)

Utility of Cystoscopy During Hysterectomy

Evelien M. Sandberg, Sarah L. Cohen, MD, MPH, Shelley Hurwitz, PhD, and Jon I. Einarsson, MD, MPH

OBJECTIVE: To estimate the incidence of cystoscopy use at time of hysterectomy and its use to detect urinary tract injury.

METHODS: This was a retrospective cohort study in a tertiary care academic center of 1982 patients who underwent a hysterectomy for any indication (excluding obstetric) between January 2009 and December 2010. Medical records were reviewed for baseline and perioperative characteristics, cystoscopy use, and information about bladder or ureteral injury related to hysterectomy.

RESULTS: Two hundred fifty-one women (12.66%, 95%
Why are cystoscopies not performed more frequently at the time of laparoscopic hysterectomy?

- Currently not standard practice to perform intraoperative cystoscopy at time of laparoscopic hysterectomy
- 19% of Canadian surgeons
- Lack of training was barrier in 59%
- Lack of privileges 14%

Barriers to routine performance of cystoscopy after laparoscopic hysterectomy

• Unclear evidence of cost-effectiveness
  - Visco et al if rate of injury > 2 % for LAVH then routine cystoscopy is cost effective

• Credentialing

• Increased operative time

Findings suggestive of urinary tract injury

- Hematuria
- Urine extravasation
- Air in Foley catheter after laparoscopy
Technical aspects

- Begin with 30° cystoscope
- Examine trigone, the interureteric ridge above the trigone
- In-out technique is used to circumferentially examine the bladder in sections ‘bladder survey’
• If specific goal is to examine for lesions, mesh or sutures in lateral aspect of the bladder, 70° cystoscope should be used

• If goal is to only examine urethra 0° or 25° cystoscope can be used
Evaluation of Ureteral Jets
Dextrose

- 10% or 50%
- Difference in viscosity and turbulence
- Potential for hyperglycemia
- Urinary tract infection
- Limited data describing use for this application
Indigo Carmine

- 40 mg IV
- Time to visualize: 5-10 min
- Short half-life 4-5 min
- Readily cleared and not reabsorbed
Indigotindisulfonate sodium

- June 2014 FDA announced shortage
- ‘Gold standard’
Phenazopyridine

• 200 mg po 30 min prior to procedure

• Limitations:
  • Preoperatively
  • Avoid renal and liver impairment, G6PD deficiency
  • May mask blood
Methylene blue

- 50 mg over 5 min IV (1) or 1-2 mg/kg IV (2)
- Does not reliably lead to staining of urine
- Used for treatment of Methemoglobinemia, cyanide poisoning and ifosfamide encephalopathy
- Avoid renal impairment, G6PD def, MAOIs, SNRIs, SSRIs

Sodium Fluorescein

- 0.25 – 1 cc (25-100 mg) of 10%
- Rapid jet evaluation 108 – 366 seconds
- Transient yellowing of sclera
- Cost effective
- Optimal dosing regimen not determined
- Low side effect profile

Sodium fluorescein use during intraoperative cystoscopy
- Limitations

- glare may limit visualization
- scarce data when used for this indication
Pitfalls

• Failure to see dye in 20 to 30 minutes mandates further investigation

• Intraoperative intravenous pyelogram, retrograde ureteropyelogram, and/or ureteral catheter placement

• Intraabdominal observation of ureteral peristalsis does not exclude ureteral injury
Finding on routine cystoscopy after TLH
Management of Stitch
Conclusions

• Most but not all urinary tract injuries are detected by intra-op cystoscopy

• Sensitivity 80 -90% for ureteral trauma

• May miss thermal injuries

• Cystourethroscopy should be readily available to gynecological surgeons

• Limited data preclude recommendation for making cystoscopy integral component of laparoscopic hysterectomy