Laparoscopic Approach for Management of Pelvic Organ Prolapse

Eric A. Hurtado, MD
Section of Urogynecology & Reconstructive Pelvic Surgery
Cleveland Clinic Florida
Objectives

• Understand the surrounding anatomy during laparoscopic prolapse procedures

• Describe the advantages and disadvantages to each approach

• Review the current literature on efficacy and complications
Pelvic Organ Prolapse (Anterior and Apical)
When to consider a laparoscopic approach?

- Patient has symptomatic pelvic organ prolapse and desires surgical correction
- The procedure can be performed in a minimally invasive fashion rather than a laparotomy
- The patient can tolerate steep trendelenberg position
- Proceed with caution in those with known severe adhesions or those with risk factors for severe adhesions
Laparoscopic Entry

• Technique
  – Veress needle
  – Hasson technique
  – Direct trocar - my preferred route with a 5 mm trocar

• Location
  – Umbilical - my preferred location
  – Supraumbilical - can limit visualization of the sacrum
  – Left upper quadrant - useful with prior mid-line incisions
Laparoscopic Set Up

• Technique
  – Veress needle
  – Hasson technique
  – Direct trocar- my preferred route with a 5 mm trocar

• Location
  – Umbilical- my preferred location
  – Supraumbilical- can limit visualization of the sacrum
  – Left upper quadrant- useful with prior mid-line incisions
Inferior Epigastric Vessels

• Usually injured during laparoscopy or Maylard incision
• Can use the needle with local to probe the area first
• Look lateral to the medial umbilical ligament and trace superiorly
• If injured can use bipolar forceps if well visualized laparoscopically
• Can use the Carter Thomasson device to pass sutures to tie off inferiorly and superiorly
Minimally Invasive Approaches

• Traditional surgery
  – Uterosacral ligament suspension

• Surgery with mesh
  – Sacrocolpopexy
Uterosacral Ligament Suspension
High USLS

• Can be performed vaginally, abdominally, or laparoscopically

• Suspends the apex of the vagina into the hollow of the sacrum – doesn’t distort the vaginal axis

• Permanent versus delayed absorbable sutures
  – My preference is for permanent suture: either Prolene or Goretex
**USLS: Results**

- Jan 94 – Dec 98 (302 patients)
  - 35 (12%) with anterior wall defect
    - 25 of these were grade 1
  - 11 (4%) with posterior defect
  - 38 patients total (13%) had one or more support defects
    - 24 of these were Grade 1
  - 87% anatomic success
  - 2 patients required another surgery for recurrent POP
- All procedures done by single surgeon

USLS: Complications

• Meta-analysis (10 studies, 820 patients)

• Ureteral injury: 1.8%
  -- 10 – suture removed
  -- 5 (0.6%) – reimplantation
  -- (1-11%; 2-4% in most studies)

• Blood transfusion: 11 pts (1.3%)

• Cystotomy during hysterectomy: 1 pt (0.1%)

• Bowel injury: 2 pts (0.2%)

• 1 permanent CNS sequelae (ventricular arrhythmia)

• 2 deaths in perioperative period
  -- 1 cardiogenic shock, 1 unknown

Laparoscopic USLS

- Diwan et al in 2005 – 25 L/S USLS cases versus 25 matched controls (TVH + “vaginal vault suspension”)
  - Equal improvement in ant & post prolapse
  - Superior apical prolapse repair
  - 3 patients in vaginal group had reoperation (none in L/S group)
  - But <1 year f/u and vaginal group were not all USLS

  - retrospective analysis of 133 patients
  - 87.2% overall success rate (avg 3yr f/u)

  - 23 patients, avg 16 mon f/u
  - 82.6% success rate

Diwan A et al. Int Urogynecol 2006;17(1):79–83
# Ureteral Compromise

<table>
<thead>
<tr>
<th>Type of injury</th>
<th>Vaginal</th>
<th>L/S</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any compromise</td>
<td>6 (10.0%)</td>
<td>0 (0.0%)</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*Fischer’s Exact test

Diwan et al. Int Urogynecol 2006;17(1):79–83
Laparoscopic USLS

- Recent study of 208 patients who underwent a uterosacral ligament suspension
  - 148 in the laparoscopic (LSC) group; 60 in the vaginal (VAG) group
  - Statistically significant differences in age (50.4 vs 55.3 years) and prior hysterectomy (3.4% vs 11.7%)
  - There were no ureteral compromises in the laparoscopic group compared to 6 in the vaginal group (0.0% vs 10.0%, respectively; P < 0.001)
  - When considering only those with ureteral compromises requiring stent placement, a higher rate of ureteral compromise persisted in the vaginal group despite exclusion of those cases requiring only suture removal and replacement (0.0% vs 5.0% in the laparoscopic and vaginal groups, respectively; P = 0.023)
  - Reoperation for recurrent POP included 4 (2.7%) in the LSC group compared to 4 (6.7%) in the VAG group with no significant difference (p=0.232)
Sacrocolpopexy
Sacrocolpopexy

- Success rates (defined as “the absence of prolapse")
  - Systematic review 1966-2004
  - 78-100% success of apical support
  - Reintervention rates for POP were 4.4% (range 0-18.2%)
  - The global rate of mesh erosion was 3.4% (70 of 2178)

- Prolene mesh is better than fascia lata graft
  - Of the 89 patients that returned with 1 year follow-up, 91% (41/45) of the mesh group and 68% (30/44) of the fascia lata group were classified as objectively cured (P = 0.007).

7-year CARE data (Open)

- Estimated treatment failure (anatomic)
  - 22-27%

- Treatment failure (symptomatic)
  - 24-29%

- By year 7, 36 of 215 women (16.7%) in the extended CARE trial had additional surgery related to pelvic floor disorders
  - 11 for recurrent POP (5.1%)
  - 14 for SUI (6.5%)
  - 11 for mesh complications (5.1%)

- Mesh exposure at 7 years: 10.5%
  - 23 total mesh exposures; 15 required surgery

ASC: Complications

- Incisional problems: 4.6%
- Transfusion: 4.4%
- Ileus: 3.6%
- VTE: 3.3%
- Cystotomy: 3.1%
- Enterotomy: 1.6%
- Presacral hemorrhage
- Mesh exposure: 3-4%

**Sacrocolpopexy**

**Table 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>All women (n = 370)</th>
<th>LSC (n = 249)</th>
<th>RSC (n = 121)</th>
<th>Odds ratio (95% confidence interval)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion to open abdominal</td>
<td>1.9 (0.9–3.9)</td>
<td>2.0 (0.9–4.6)</td>
<td>1.7 (0.5–5.9)</td>
<td>0.5 (0.1–1.5)</td>
<td>.81</td>
</tr>
<tr>
<td>Bladder injury</td>
<td>1.2 (0.5–2.9)</td>
<td>0.4 (0.07–2.2)</td>
<td>3.3 (1.3–8.2)</td>
<td>0.1 (0.02–0.93)</td>
<td>.04</td>
</tr>
<tr>
<td>Ureteral injury</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Bowel injury</td>
<td>1.6 (0.7–3.5)</td>
<td>1.2 (0.4–3.5)</td>
<td>2.5 (0.8–7.9)</td>
<td>0.55 (0.1–2.8)</td>
<td>.36</td>
</tr>
<tr>
<td>Vascular injury</td>
<td>0.7 (0.3–2.1)</td>
<td>0.8 (0.2–2.9)</td>
<td>0.8 (0.1–4.5)</td>
<td>1.1 (0.1–12.4)</td>
<td>.98</td>
</tr>
<tr>
<td>Estimated blood loss ≥ 500 mL</td>
<td>1.0 (0.4–2.5)</td>
<td>0</td>
<td>2.5 (0.8–7.9)</td>
<td>0.2 (0.02–0.81)</td>
<td>.01</td>
</tr>
<tr>
<td>Wound infection</td>
<td>3.7 (2.3–6.0)</td>
<td>2.8 (1.4–5.7)</td>
<td>4.1 (1.7–9.3)</td>
<td>0.8 (0.3–2.4)</td>
<td>.50</td>
</tr>
<tr>
<td>Hematoma</td>
<td>0.7 (0.3–2.1)</td>
<td>1.2 (0.4–3.5)</td>
<td>0</td>
<td>—</td>
<td>.23</td>
</tr>
<tr>
<td>Transfusion</td>
<td>0.5 (0.1–1.8)</td>
<td>0.4 (0.07–2.2)</td>
<td>0</td>
<td>0.5 (0.03–8.9)</td>
<td>.49</td>
</tr>
<tr>
<td>Pelvic abscess</td>
<td>0.8 (0.3–2.4)</td>
<td>0.8 (0.2–2.9)</td>
<td>0.8 (0.1–4.5)</td>
<td>1.4 (0.3–7.3)</td>
<td>.98</td>
</tr>
<tr>
<td>Osteomyelitis</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Deep vein thrombosis/pulmonary embolus</td>
<td>0.5 (0.1–1.8)</td>
<td>0.8 (0.2–2.9)</td>
<td>0</td>
<td>—</td>
<td>.32</td>
</tr>
<tr>
<td>Illus</td>
<td>0.5 (0.1–1.9)</td>
<td>0.8 (0.2–2.9)</td>
<td>0</td>
<td>—</td>
<td>.32</td>
</tr>
<tr>
<td>Bowel obstruction</td>
<td>0.8 (0.3–2.4)</td>
<td>0.4 (0.07–2.2)</td>
<td>1.7 (0.5–5.9)</td>
<td>0.6 (0.08–4.0)</td>
<td>.21</td>
</tr>
<tr>
<td>Neurologic injury</td>
<td>3.5 (2.1–5.9)</td>
<td>3.5 (1.9–6.7)</td>
<td>3.3 (1.3–8.2)</td>
<td>1.3 (0.4–4.2)</td>
<td>.88</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>1.6 (0.7–3.5)</td>
<td>1.8 (0.6–4.1)</td>
<td>1.7 (0.5–5.9)</td>
<td>0.7 (0.2–3.3)</td>
<td>.97</td>
</tr>
<tr>
<td>Cardiac</td>
<td>0.8 (0.3–2.4)</td>
<td>0.8 (0.2–2.9)</td>
<td>0.8 (0.1–4.5)</td>
<td>0.8 (0.1–5.0)</td>
<td>.98</td>
</tr>
<tr>
<td>Mesh erosion</td>
<td>2.7 (1.5–4.9)</td>
<td>2.4 (1.1–5.2)</td>
<td>3.3 (1.3–8.2)</td>
<td>0.3 (0.06–1.8)</td>
<td>.82</td>
</tr>
<tr>
<td>Clavien-Dindo Grading System grade 3</td>
<td>26.3 (22.0–31.0)</td>
<td>26.4 (21.3–32.3)</td>
<td>26.1 (19.0–34.6)</td>
<td>1.0 (0.8–1.5)</td>
<td>.81</td>
</tr>
</tbody>
</table>

Data unadjusted for baseline differences and presented as % (95% confidence interval).
LSC, conventional laparoscopic sacrocolpopexy; RSC, robotic-assisted laparoscopic sacrocolpopexy.

*Unplanned odds ratio. Statistically significant difference at α = .05. Risk factors, endoscopic, or radiologic imaging/intervention (with or without anesthesia).

Sacral Promontory

• Surrounding structures
  – Ureter, R common iliac artery, L common iliac vein, R ureter, sigmoid colon, middle and lateral sacral vessels, veins over bony sacrum

• Bleeding
  – Isolate bleeding, note surrounding structures and cauterize or tie off
  – If unable, apply pressure, can stuff a sponge through the port
  – Use Floseal, bone wax, bone tacks, call Vascular with large vessel injury
Sacral Promontory

- A review of spinal magnetic resonance images of 73 women
  - At the promontory, there was an intervertebral disc in (53 [73%])
  - The remaining images confirmed a nondisc promontory
  - In those with the disc at the promontory, the distance between the promontory and L5 was 13 mm
  - In those without the disc at the promontory, the median distance between the promontory and the base of L5 disc was 1.29 mm
  - The authors recommend that to place a stitch over bone, it would need to be 13 mm cephalad from the promontory.

LSC ASC vs open ASC

• The laparoscopic and robotic procedures are gaining popularity
• Advantages:
  – Shorter hospital stay
  – More rapid recuperation
  – Less postoperative pain
  – Comparable short-term efficacy
  – Less blood loss
• Disadvantages:
  – More operative time
    – This can be arguable
  – Cost
Laparoscopic vs Robotic

- Randomized controlled study: laparoscopic or robotic assisted
- Patients blinded to treatment
- Comparison of robotics to laparoscopy:
  - More expensive (+$1936)
  - More post-operative pain (3-5 weeks after surgery),
    - Patients used more NSAIDs (20 days instead of 11 days)
    - No difference in narcotic use
  - No significant different in anatomy or quality of life measures

Laparoscopic Sacrocolpopexy

Laparoscopic Sacrocolpopexy

- Study of 189 patients underwent laparoscopic hysterectomy
  - 123 TVH + LSC SC vs. 59 LSH + LSC SC
  - No difference was found in the rate of mesh-related complications (1.6% [2/123]; 95% confidence interval, 0–3.86% vs 1.7% [1/59]; 95% confidence interval, 0–4.99%; P = 1.0).
  - Follow-up was similar between groups (9 (2–17) months TVH-LSC vs 9 (2–17) months LSH-LSC, P = 1.0).
  - The TVH-LSC was associated with a significantly shorter operative time (256 ± 53 vs 344 ± 81 minutes; P < 0.01).
  - There were no differences in intraoperative or postoperative complications or subjective and objective success between groups.

Nosti PA et al. Female Pelvic Med Reconstr Surg 2015; e-pub ahead of time
Robotic Approach
Laparoscopic Enterocele Repair

- Large enteroceles can form between the anterior wall of the rectum and posterior vaginal wall
- Symptoms often include: pelvic/rectal pressure and outlet obstruction constipation
- Significant vaginal prolapse may not be noted
- Laparoscopy can be used to close of the posterior cul-de-sac in case of enterocele, especially in those that lack vaginal prolapse.

Complications of any Prolapse Surgery

• SUI
  – May occur after vaginal vault suspension procedures
  – Secondary to straightening of UVJ with restoration of vaginal length and depth
  – Test preoperatively (reduce prolapse)

• Vaginal stenosis
  – Too much anterior or posterior vaginal wall tissue trimmed or if too tight PR
  – Postop use of estrogen cream?

• Dyspareunia
Hysterectomy versus Uterine Preservation

• More women requesting uterine preservation for reasons other than childbearing
  — Including patient perception that sexual function is improved with preservation of the cervix

• “Uterine preservation may be an option in appropriately selected women who desire it; however, prospective randomized trials are needed to corroborate this.”

• Several studies have reported good results with L/S suture hysteropexy (USLS) and sacrospinous hysteropexy

Walters and Karram, 2007 (textbook)
Thanks