Laparoscopic Hysterectomy – tips and tricks

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DISCLOSURE

I have no financial relationships with a commercial entity producing health-care related products and/or services.
## Hysterectomies BWH 2009-2015

<table>
<thead>
<tr>
<th></th>
<th>AH</th>
<th>LH</th>
<th>RH</th>
<th>VH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>655</td>
<td>2490</td>
<td>155</td>
<td>698</td>
</tr>
<tr>
<td>Intraoperative complications</td>
<td>5.1%</td>
<td>1.7%</td>
<td>3.9%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Readmission (60 days)</td>
<td>3.5%</td>
<td>1.8%</td>
<td>3.2%</td>
<td>2.9%</td>
</tr>
<tr>
<td>OR time (minutes)</td>
<td>156</td>
<td>129</td>
<td>185</td>
<td>139</td>
</tr>
<tr>
<td>EBL</td>
<td>328</td>
<td>93</td>
<td>105</td>
<td>137</td>
</tr>
<tr>
<td>Uterine weight</td>
<td>628</td>
<td>281</td>
<td>251</td>
<td>103</td>
</tr>
<tr>
<td>Length of stay (days)</td>
<td>2.88</td>
<td>0.59</td>
<td>0.65</td>
<td>1.12</td>
</tr>
</tbody>
</table>
10 steps towards successful LH

- Open access article on PubMed
Step 1 – Preparation and positioning

- Use pink foam on all pts – taped to table
- Arms always tucked with padding and arm holders
- Use only as much Trendelenburg as needed
- Table all the way down
- Monitors face each surgeon directly
- Surgeon is responsible for equipment and needs to know how it all works – check your equipment prior to surgery!!
- Simplify equipment list as much as possible
## Partial equipment list

<table>
<thead>
<tr>
<th>Standard Equipment</th>
<th>Comments/tips for usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmonic</td>
<td></td>
</tr>
<tr>
<td>Reusable Bipolar Grasper</td>
<td>Power setting at 50 W</td>
</tr>
<tr>
<td>2-3 5 mm trocars and one 12 mm trocar</td>
<td>Prefer using 12 mm trocar at umbo</td>
</tr>
<tr>
<td>Two duckbill grasper</td>
<td>Universal grasping ability</td>
</tr>
<tr>
<td>Uterine manipulator</td>
<td>RUMI for longer cervix, Vcare for narrow introitus</td>
</tr>
<tr>
<td>20 cm ø PDO unidirectional barbed suture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optional Equipment</th>
<th>Comments/tips for usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diluted vasopressin – 20 U /400 ml saline</td>
<td>Avoid using more than 10 units at a time</td>
</tr>
<tr>
<td>5 and 10 mm tenaculum</td>
<td>For larger uteri</td>
</tr>
<tr>
<td>30 degree/flexible tip laparoscope</td>
<td>For larger uteri</td>
</tr>
<tr>
<td>Fascia closure device</td>
<td>Not needed for thin patients</td>
</tr>
<tr>
<td>Triple hook clamps</td>
<td>For vaginal morcellation</td>
</tr>
</tbody>
</table>
Alternative energy sources work well

- Ligasure
- Gyrus
- Enseal
- Bipolar and scissors
- Surgeon preference
- Try to use only one disposable energy source
Step 2 – Insertion of uterine manipulator

- Use Sims and tenaculum – avoid using a speculum except to find the cervix and grab it with a tenaculum – gets the cervix closer to you
- RUMI 2 is back-loaded like the VCARE which makes insertion easier
- Place a suture of 1 Prolene (good bite) through anterior lip of cervix – assists with manipulator insertion and ultimately specimen extraction
Uterine manipulator in place
Step 2 - continued

- Make sure you choose the correct ring size!!
  - Ring too small – will not delineate fornice
  - Ring too large – may incorporate upper vagina and risk ureter injury
- The following is the most important tip!!
- Visually confirm that the ring is in the right place at the onset of the procedure – if the ring is below the insertion of the uterosacral ligaments it is
  - Not placed correctly
  - Too small
- Don’t follow the ring blindly if this is the case!!
Correct placement of vaginal cup
Step 3 - Laparoscopic entry

- Insertion of the first trocar is the most dangerous step in laparoscopy
- This step accounts for 40% of laparoscopic injuries and accounts for the majority of fatalities associated with laparoscopy
- Bowel injury and vascular injuries are the main concern here
Abdominal entry can be dangerous
Which entry method is the best?

- Short answer;
- NOBODY KNOWS!!!
- Cochrane says “On the basis of evidence investigated in this review, there appears to be no evidence of benefit in terms of safety of one technique over another. However, the included studies are small and cannot be used to confirm safety of any particular technique”
- 17 RCTs with 3040 patients
Go to the deepest part of the umbilicus where the abdominal wall is thinnest
- Hemostat and 15 blade
- Be careful to only go through skin and dermis
- Kocher clamp
- Attach tubing prior to entry
- Straight in with Veres
- Listen for “chirp”
- Straight in initially with trocar, then 45 degrees once through fascia
Avoid laparotomy scars – up to 50% incidence of adhesions

Prior laparoscopy has a reported incidence of adhesions up to 20% but I don’t believe it!

LUQ a good choice since;

- Rare site of adhesions (does stomach prevent them?)
- Not much there to damage...except stomach, spleen, kidney, renal vessels, tail of pancreas etc etc
Stomach NEEDS to be desufflated
Avoid LUQ in patients with a history of:
- Gastric bypass
- Splenectomy
- LUQ surgery
Consider
- RUQ (avoid liver and gallbladder)
- Midline below xyphoid process (avoid the heart, pancreas, aorta, vena cava and other minor structures)
- Any place on the abdominal wall that is far away from laparotomy scars
Alternative site entry

- Make a 5 mm skin incision with a knife
- Insert 5 mm laparoscope within an optical trocar
- Watch the layers of the abdominal wall
  - Fat
  - Fascia
  - Muscle
  - Fascia
  - Peritoneum – note that the distance between the second layer of fascia and peritoneum is VERY short
- Change the angle of insertion to 45 degrees when entering the second fascia layer – this avoids hitting the back side of the abdominal wall!
Alternative site entry
Alternative site entry
Alternative site entry
Trocar positioning
Step 4 – Hug the ovaries

- Stay away from sidewall when taking the ovaries
- Stay away from the uterus when sparing the ovaries
- Desiccate with reusable bipolar grasper
- Transect on max setting with harmonic
- Take special care to desiccate the parametrial veins that run between ovary and round ligament
- Uterine manipulator is being pushed cephalad and to the contralateral side to provide maximal visualization
Step 5 – Mobilize bladder

- The round ligaments are transected midway between the uterus and pelvic sidewall and the anterior and posterior leaves of the broad ligament are separated.
- The correct plane is where the peritoneum separates easily with gentle manipulation.
- Identify the vesicouterine fold and continue dissection anteriorly – stay in loose areolar tissue.
Step 5 – Mobilize bladder continued

- In patients with scarring/prior cesarean;
  - Stay higher than normal
  - Fat belongs to the bladder
  - Start the dissection laterally
  - Avoid use of bipolar electrosurgery unless absolutely necessary
- Air in the Foley bag = bladder injury
1982 patients had a hysterectomy between January 2009 and December 2010
- 251 (12.7%) had cystoscopy done
- Cystoscopy more common among low-volume surgeons and in urogyn procedures
- 14 bladder injuries (0.71%)
- 5 ureteral injuries (0.25%)
- None were detected by cystoscopy
- Low volume surgeons and laparoscopic/robotic mode of access were significantly associated with ureteral injury

Sandberg et al. Obstet Gynecol. 2012 Dec;120(6):1363-70
10 recognized and repaired intraoperatively
4 were not recognized

- 2 cases - no cysto done
  - Tumor dissected off surface of bladder (TAH)
    - Vesico-vaginal fistula diagnosed one week later
  - Ascites diagnosed 4 days post-operatively (TLH) by CT urogram – repaired via laparotomy

- 2 cases - cysto done
  - Bladder backfilled and cysto normal (TLH)
    - CT urogram confirmed vesicovaginal fistula 1 week postop – repaired via laparotomy
  - Bladder backfilled and cysto normal (TLH)
    - CT urogram confirmed VVF at 10 days post op – repaired via laparotomy
### Ureter injuries

<table>
<thead>
<tr>
<th>Type</th>
<th>Cysto</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRH</td>
<td>No</td>
<td>Urine leakage post-op; cysto normal. Continued leakage; CT urogram and retrograde pyelogram. Left ureteral injury dx and stented. Continued leakage; repeat CT urogram right ureteral injury – reimplemented via laparotomy</td>
</tr>
<tr>
<td>TLH</td>
<td>No</td>
<td>Left ureter in close proximity to coagulated edge of vaginal cuff. Postoperative leak into abdomen; ureteral stricture; stented; eventual laparotomy and reimplantation</td>
</tr>
<tr>
<td>TLH</td>
<td>No</td>
<td>Developed vaginal leakage 2 weeks post-op. Cystogram normal. CT urogram; ureteral obstruction; stented</td>
</tr>
<tr>
<td>TLH</td>
<td>No</td>
<td>Vaginal leakage 2 days postop; cystogram normal; CT urogram showed ureteral leakage and kinking; stented</td>
</tr>
<tr>
<td>TLH</td>
<td>No</td>
<td>Vaginal leakage 2 days postop; CT urogram showed ureteral injury; reimplantation with psoas hitch</td>
</tr>
</tbody>
</table>
Step 6 – secure the uterine vessels

- Skeletonize with harmonic by carefully taking anterior and posterior broad ligament off vessels
- Push cephalad with uterine manipulator – this moves uterine vessels up and away from the ureters
- Dessicate the uterines using the bipolar grasper
  - Stay above the rim of the cup (thermal spread 13 mm)
  - Use intermittent bursts of energy
    - Avoid charring – increases resistance
    - Watch bubbles – stop applying energy when bubbles begin to fade
Step 6 - continued

- Create an inverted V-shape cut on the ascending vessels at the level of the internal os
  - Anterior and medial
  - Posterior and medial
- This enables the vessels to fall out laterally
  - Creates a safety zone for the ureters and bladder
  - Creates a vascular pedicle that can be easily grasped and desiccated in case of recurrent bleeding
Lateralize the uterine arteries
Ureter and hysterectomy
Ureter and uterine vessels
Uterine artery and bladder
Bladder injury repair after TLH
Step 7 – separate uterus from vaginal apex

- Use harmonic on max to make a circumferential cut around the cup
- Don’t direct the harmonic directly into metal as the blade can break
- Don’t push hard into a plastic cup as the plastic will melt
- In case of a supracervical hysterectomy, use the drill technique
  - Activate on max with jaw open
  - Push active blade into cervix at internal os
  - Close jaws while activating
Step 8 – Specimen removal

- Pull uterus into vagina if fits (TLH)
- Alternatively use a glove with a couple of 4x8 sponges to maintain pneumo while suturing
- Uterus too large to fit
  - Narrow introitus/poor access – morcellate with knife inside an endobag via umbilicus or suprapubic minilaparotomy
  - Good vaginal access – place specimen in an endobag and morcellate vaginally using a 10 blade knife and triple hooks
Landscape has changed in the last few years
A recent decision analysis showed that hysterectomy related deaths were higher with abdominal hysterectomy (32 vs 12 per 100,000) in a scenario of uncontained morcellation
- LH with lower risk of DVT, wound infection, transfusion and incision hernia
- AH with lower risk of cuff dehiscence and deaths from LMS

Step 9 – vaginal cuff closure

- 20 cm Stratifix PDS
- Start at distal corner
- Approx 1 cm thick bites
- Back-bites with proximal end
- Essentially a two layered closure
Step 10 – Inspection and closure

- Make sure to inspect all pedicles carefully prior to closing
- Ureteral peristalsis does NOT equal ureteral integrity
- We do not perform routine cystoscopy
- If a ureteral injury is suspected, the ureters need to be dissected out and/or stented
- The most common mode of ureteral injury at LH is thermal – this MAY NOT be picked up at cystoscopy
Post-op management

- Toradol 30 mg iv q 6 hours scheduled
- Oxycodone/acetaminophen per os for breakthrough pain
- PONV risk factors evaluated pre-op and treated prophylactically
- Patients are given a choice pre-operatively to either go home the same day or the following morning
- Majority go home within 3-4 hours of surgery
Laparoscopic hysterectomy video
Thank you