Total Laparoscopic Hysterectomy: Body Mass Index and Outcomes

Katherine A. O’Hanlon, MD, Lisbeth Lopez, Suzanne L. Dibble, DNN, RN; Anne-Caroline Garnier, Gloria Shining Huang, MD, and Mirjam Leuchtenberger

OBJECTIVE: This retrospective review of patients undergoing total laparoscopic hysterectomy examines whether differences in outcomes exist on the basis of body mass index (BMI).

METHODS: All cases of total laparoscopic hysterectomy performed from September 1996 to July 2002 for benign diagnoses, and minimally invasive cervical, early endometrial, and occult ovarian carcinoma were reviewed. There were 330 patients analyzed by BMI category (range, 18.5–54.1): ideal (n = 150) less than 25.0 kg/m², overweight (n = 95) 25.0 to 29.9 kg/m², and obese (n = 75) 30 kg/m² or more. Seven patients were converted to laparotomy (four ideal BMI, two overweight, one obese) leaving 323 (98%) for analysis. Mean age (50 years), height (65 in.), and parity (1.2) were similar, with 39% nulligravidas in each group.

RESULTS: Mean operating time (156 minutes), blood loss (166 mL), and length of hospital stay (1.9 days) did not vary by BMI group. Total complication rates (8.9%), and major (5.5%) and minor (3.4%) complication rates were similar in each BMI group. Ureteric injury was observed in 3.1%, with two-thirds occurring in the first one-third of the patient series.

CONCLUSION: Total laparoscopic hysterectomy is feasible and safe, resulting in short hospital stay, minimal blood loss, and minimal operating time for patients in all BMI groups. The laparoscopic approach may extend the benefits of minimally invasive hysterectomy to the very obese, for whom abdominal surgery poses serious risk. (Obstet Gynecol 2003;101:1384–92. © 2003 by The American College of Obstetricians and Gynecologists.)
Direct trocar entries (DTE)

• **Direct Trocar Entry**: Transumbilical apex, spreading-tip, no insufflation, compared with veress needle (VN).\(^1,2\)
  – No complications with DTE trocar.
  – 2 umbilical superficial infections.
• **One trocar complication in 830 cases. (procedure rules not followed). Now 2 after 2271.**\(^3\)

3. O’Hanlan et al Complications from 830 TLH, JMG, 2007

**Direct Trocar Entry technique**
- Evert umbo to apical scar.
- Inject, incise vertically across apex.
- Insert one side of 2 towel clips.
- Grasp skin if high BMI, or senior.
- Elevate to max.
- Insert trochar vertically 90 degrees.
DTE v. VN for umbilical entry

• Meta-analysis: VN entry technique carries a significantly increased risk of complications over DTE.

• Risk of multiple insertions and failed entry are significantly higher with VN v. DTE.

DTE v. VN

- Bariatric surgery: DTE safer, quicker.
  - Altun et al. Surg laparos, endos & perc techniques 2010
- DTE safe, less gas embolism, faster. LUQ entry if scar, umbilical hernia, or after three failed insufflation attempts at the umbilicus.
  - Vilios et al JOGC, 2007
- Optical port not prevent injuries.
  - Minervini et al., Arch Ital Urol Androl 2008
  - Vilios et al JOGC, 2007

Cochrane review: DTE preferred

- 7 RCT’s, 2,940 cases.
- Significant benefits with Direct Trocar Entry technique over Veress Needle.
  - less failed entry,
  - less extraperitoneal insufflation
  - fewer omental injuries
- Direct Trocar Entry is safer technique.
  - Ahmad et al. Cochrane database of systematic reviews. 2012
DTE with prior subumbilical incisions

Our direct trocar entry after someone else’s infra umbilical incision
Midline incisions near umbo: Palmer’s

• Expect omental or small bowel adhesions to internal incision.
• Consider left subcostal entry (Palmer’s point)
  – Insert oro-gastric tube to deflate stomach.
  – Incision directly over costal margin in MCL.
  – Lift left abdominal wall.
  – Insert 5mm trocar at 45°, aiming for left common iliac artery.
  – Expect three pops: Ext Obl, Int Obl, Peritoneum.
  – Visual confirmation.
Subcostal Trocar

- If prior midline laparotomy scar within 2-3 cm of umbilicus.
- Incision should be lateral to rectus abdominus to avoid Epigastric Artery.
- Not necessary if prior laparoscopy.
Elbows at side, point to cervix
Pre-emptive anesthesia

• .025% Marcaine without epi, ~8cc in each of four sites.
  – Skin
  – Fascia, peritoneum.
  – Not fat. No nerves there.

• Lowers pain scores
CO₂ Cystosufflation to prevent injury

- Distension facilitates margin delineation during dissection of adhesions around fibroids, endometriosis.
- Assumes single filed sterile prep.
- Procedure:
  - Kelly on catheter. Attach insufflator line.
  - While watching bladder, open kelly when distended.
  - May need to re-insufflate.
  - Deflation is quick.
  - Reconnect to bag tubing.
Prevent hypothermia

- If skinny: wrap legs with warm blanket.
- Use warming air blankets on torso.
- Use warm irrigation fluid.
- Eliminate as much gas at procedure end as possible. Subdiaphragmatic bubble size correlates with post-op pain.
- Humidify and heat Carbon dioxide to prevent heat loss and to reduce cramping and ileus. (Insufflow)
Heated humidified CO2 in laparoscopy

- 10 RCT's; 565 patients.
- Humidified groups had significantly
  - less post-operative pain,
  - less hypothermia,
  - lower analgesic requirements.

Sajid et al. Surg Laparosc Endosc Percutan Tech 2009
Heated humidified CO2 in laparoscopy with nebulized lidocaine

- N=23 patients randomized to water or lidocaine, 5mg/kg lidocaine via Insufflow.
- Ave 38 mg given per case.
- Lidocaine in Insuflow decreased pain scores post-op.


In conclusion, when compared with instillation, peritoneal nebulization of ropivacaine significantly reduced the proportion of patients requiring morphine, reduced the intensity of postoperative pain, increased the proportion of patients with minimal or no pain, and increased the proportion of patients with shivering after laparoscopic ovarian cyst surgery.
Ligasure vessel sealing

Heats only enough to denature proteins in compressed tissue, cools as reliable solid seal.
Salpingectomy: post reproduction

- **Most effective tubal sterilization**,¹ ⁵ (US Collab. Review of Sterilization)
- **No negative impact on ovarian function.**²
- **Can reduce incidence of:**
  - Serous cancer from 6.4 to 2.6%.³
  - Surgery for tubal disease 8% after TL.⁴

» 1. Peterson et al, AJOG, 1996
» 2. Seidhoff et al, JMIG, 2013
» 3. Lessard-Anderson et al, SGO, 2013
» 4. Morse et al, AJOG, 2002

**Grasp the “triple ligaments” of the Cornu and pull**
Avoid ureteral injury:
use same technique as open!

- Push uterus up with manipulator after incise through Round Ligament. (ie traction-counter-traction on cervico-vaginal margin)
- Hold up continuously. Check traction yourself, if it gets difficult.
- Frequent “haptic” palpation of manipulator on CVM.
- Skeletonize uterine arteries somewhat.
- Cauterize uterine vessels and incise ON the cervix at lower third of length of cervix.
Colpotomy *neatly* with monopolar

Use **wide side** of tip to hemostatically incise pubocervical fascia directly at V-Care edge on CVM. Then sharp side to incise into vagina. **NOT** associated with dehiscence!

Removing the uterus

- After opening vagina 2 cm, surgeon holds vaginal edge and cervical edge with two Semm’s and exposes the fold of the CVM to the assistant.
- Assistant incises in the fold of the CVM.
- Surgeon advances Semms close to the incision after each cut.
Removing the tissue

- If grossly malignant, put in bag.
- If unsure, put in bag.

- Usually the uterus does not come out on manipulator.
- Place glove with 2 fluffed 4x4's inside vagina.
- Advance closed tenaculum alongside glove.
- Watch as grasp cervix, confirm 360° look no other tissue in tenaculum...eg rectum.

Glove with two dry 4 x 4's

Grasp cervix in air, with no adjacent tissue. Check to be sure.
Any type ribbon retractor to delineate anterior cervico-vaginal margin.

Monopolar current will disseminate through these without injury to tissue.

Completing the colpotomy

• If air leak around V-Care because large vagina, remove V-Care and insert glove with two 4x4.
• Use two Semb graspers.

Semb cupped toothed biopsy forceps make a great grasper.
Hysterectomy: Can allow prolapse, if no effort to fix/prevent mild to moderate prolapse.

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<td>Rectocele</td>
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<td>SUI</td>
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Hendrix, AJOG, 2002, Hendrix, JAMA, 2005)
Don’t leave the vagina apex unsupported!!!
Uterosacral ligament colposuspension

• Anchoring the vaginal cuff to the uterosacral ligament pedicle is commonly practiced as a mode to support the vaginal apex, but the surgeon must take care to avoid an anchoring stitch lateral to the cuff margins so as not to run the risk of incorporating the ureter into the closure.

ACOG
Recommendations and Conclusions
Pelvic Organ prolapse

• Vaginal apex suspension should be performed at hysterectomy for uterine prolapse to reduce risk of recurrent POP.
• USL colposuspension = sacrospinous fixation.
  – ACOG Practice Bulletin Summary #185,
  – O&G 2017
Conclusion: 

- A running 5mm deep ~ 5mm apart culdotomy closure, 
- that incorporates the uterosacral ligaments with the pubocervical fascia, 
- with reperitonealization when possible, 
- appears to be associated with few postoperative vaginal cuff complications.
Prevention of Postlaparoscopic Shoulder and Upper Abdominal Pain
A Randomized Controlled Trial

Hsiaw-Wen Tsai, MD, Peng-Hui Wang, MD, PhD, Ming-Shyen Yen, MD, Kuan-Chong Chen, MD,
Teh-Fu Hsu, MD, and Yi-Jen Chen, MD, PhD

• Fill upper abdomen with 500cc~1 liter).
  – Facilitates diffusion of CO2.
  – Buffers pH.
  – Floats more bubbles out
• In Trendelenburg, anesthesia gives 5 manual breaths at pressure of 60cm H2O.
  – Allow CO2 to exit through ports
• At 12, 24, and 48 hours, shoulder pain and abdominal pain scores were lower than controls.

4-0 Vicryl subcuticular, vertical, inverted
Patient damage from prolonged case

- Intraorbital edema from trendelenburg can cause blindness. Give albumin to prevent.
- Lower leg compartment syndrome.
  - Raised pressure in compressed muscular compartment impedes blood flow causing ischemia, toxic metabolites.
  - Reperfusion can cause inflammatory edema and compartment syndrome.
- Do not take longer than 4 hours to get patient out of trendelenburg.

Lawrenz et al. JMIG 2011
Post-operative care

- Prevent pain: IV then PO.
- Treat pain: IV then PO.
- Regular diet.
- D/C IV when tolerate PO.
- Ambulate halls to max tolerance.
- Foley out when ambulatory or by 6:30am.
- Advise to re-read the 13-handout before d/c.
- Home after void.

Home care

- Home same or next day.
- Prevent pain: APAP+NSAID x 2 days
- Treat pain: gave Rx Tramadol 50 at pre-op.
- Ambulate outside house 20min TID. (3 twenties)
- My Office Staff calls to triage once, on day 2-4:
  - Had BM?
  - Void okay?
  - Pain manageable?
  - Incisions okay?
  - Discharge/bleeding?
- See at 6 weeks.

Any Problems, I call them, see them.
First single-incision type 7 total laparoscopic hysterectomy, adnexectomy, and appendectomy

Conclusions

Katherine A. O’Hanlan

New technology has made type 7 total laparoscopic hysterectomy, bilateral salpingo-oophorectomy, and appendectomy possible through a single umbilical skin incision (Fig. 5), but these procedures require prospective randomized trials to confirm any real benefit to the patient as they are challenging to perform. To our knowledge, this is the first reported type 7 total laparoscopic hysterectomy, adnexectomy, and appendectomy. Developing technologies will make this approach more feasible in the future.

Needlescopic TLH

- 68 cases randomized by approach to either a needlescopic or single port TLH.
- EBL, duration of stay same for both groups.

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<th>Single port</th>
<th>Minilap</th>
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<tr>
<td>Duration surgery (min)</td>
<td>120</td>
<td>90</td>
<td>&lt;.05</td>
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<tr>
<td>Post-op pain (vas scale)</td>
<td>3</td>
<td>2</td>
<td>&lt;.001</td>
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- Fanfani et al, JMIG 2013
My future: Needlescopic TLH
Contra-Indications for TLH

**Exclusion Criteria:**
- Severe intestinal adhesions from prior op report.
- Complex ovarian mass too big for bags (consider hand assist with cassette bag).
- Metastatic disease, unless palliative or advanced skill.

TLH - Conclusions

- Takes no longer than open.
- Round 2 days less than open.
- Blood loss lower (mean 75cc, 0-2000)
- Nulligravid safe (40% were G₀)
- Obese safe (mean BMI 27, 16-71)
- Senior safe (mean 50, range 15-90)
- Massive safe (mean 239g, range 26-3131)
- Pelvic mass safe (mean 7cm, range 2-19)

- Technique / plains are all familiar.
- Complications rates similar.