The Hysterectomy Playbook
(Didactic)

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Target Audience
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This will be a video-based didactic course on laparoscopic hysterectomy with emphasis on how to approach difficult pathology. The focus will be placed on the fundamentals of pelvic anatomy, dissection techniques, electro surgical instrumentation, and retroperitoneal dissection techniques pertinent to the difficult laparoscopic hysterectomy. We will present a standardized TLH technique as well as tricks and tips for dealing with the obese patient, large uterus, ovaries stuck to the pelvic sidewall, scarred bladder, obliterated cul de sac, cervical and broad ligament fibroids. Vaginal cuff closure techniques will also be discussed.

**Learning Objectives:** *At the conclusion of this activity, the clinician will be able to:* 1) Use the learning process to present an anatomic standardized technique (using exposure and avascular spaces) for TLH; 2) demonstrate technique for large uterus, cervical, and broad ligament fibroids; 3) demonstrate technique for ovary stuck to the pelvic side wall; 4) demonstrate technique for scarred bladder flap; 5) demonstrate technique for obliterated cul de sac; and 6) demonstrate technique for vaginal cuff closure.

**Course Outline**

8:00 Welcome, Introductions and Course Overview  
8:10 Standardized A-B-C Approach to TLH  
8:30 Anatomical Landmarks and Avascular Spaces  
8:50 Exposure, Visualization and Dissection Techniques  
9:10 Adherent Ovary and Scarred Bladder Flap  
9:30 Questions & Answers All Faculty  
9:45 Break  
10:00 Pelvic Sidewall and Ureter: Keep Your “Enemy” under Vision  
10:20 Large Patients, Previous Surgeries, Large Uterus  
10:40 Cervical and Broad Ligament Fibroids  
11:00 Cuff Closure Techniques – Prevention of Dehiscence and Prolapse  
11:20 Obliterated Cul-de-Sac and Rectovaginal Nodule  
11:40 Questions & Answers All Faculty  
12:00 Course Evaluation/Adjourn
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Harry Reich
Other: Royalty: CooperSurgical
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Asterisk (*) denotes no financial relationships to disclose.
Standardized A-B-C Approach to TLH

Harry Reich
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• 25 years in the making
• And still not finished

• A long way to go?

Disclosure

• Stockholder: Encision Inc.
• Other: Royalty: CooperSurgical

“When you’re young, you’re very reckless. Then you get conservative. Then you get reckless again.”

That is, if you live long enough.

Clint Eastwood

Standardized A-B-C Approach to TLH

• No such animal exists!
• Another attempt by academia and industry to stymie progress??
• Better to work to increase surgical skill than to advocate rules.

Hysterectomy.

• Abdominal hysterectomy (Incision).
• Vaginal hysterectomy.
• Laparoscopic hysterectomy (LH).

TAH (Richardson technique)

• Surg Obstet Gynecol, 1929
• Written in response to the problems created by supracervical hysterectomy
• The major changes in technique introduced were extrafascial removal of the entire uterus with anchoring of the anterior and posterior vaginal cuff at the corners to the uterosacral ligaments.
Hysterectomies for benign disease in USA 2006

- Laparotomy 66%
  - TAH 60%
  - Supracervical 6.4%
- Others 34%
  - Vaginal 20.6%
  - Laparoscopic 10.8%
  - Laparoscopic supracervical hyst 2.7%
- Thus 9% of all hysts are supracervical

Supracervical hystectomy (with or without a laparoscope)
- Approach is usually abdominal, rarely vaginal, and increasingly laparoscopic.
- Is it a hysterectomy?
- Whether a partial or half a hysterectomy should be included in hysterectomy classifications is debatable.
  - (Partial oophorectomy or cystectomy not oophorectomy.)

I have just a few questions. And obviously I don’t like the trend toward supracervical hysterectomy and am looking for a reason.
- I suspect that the reimbursement is similar for all types of laparoscopic procedures. If so, it should be easy to understand why so many LSHs are done.

Industry
- First global ablation
- Then mechanized hysterectomy
- Is the vagina programmed to fall down and require another operation?
- Then mesh
- Then removal of mesh
- Then high McCall

Total laparoscopic hysterectomy?
- What is a hysterectomy?
- Simply taking out the uterus......... or more?
“laparoscopic hysterectomy” LH
- an umbrella term encompassing all types of laparoscopically associated surgical procedures in which the uterus is removed.
- In reality, laparoscopic hysterectomy, or LH, is a distinct procedure. Its sine qua non is laparoscopic ligation of the uterine arteries by means of electrosurgical desiccation or suture ligature. All subsequent maneuvers can be accomplished either vaginally or laparoscopically.

LAH “laparoscopic associated hysterectomy”
- The term “laparoscopic hysterectomy” includes many different operations where the laparoscope is used as an aid to hysterectomy.
- While it is important that these different procedures are clearly delineated, some overlap is unavoidable, especially between LAVH and LH (LAVH is more a vaginal hysterectomy) and between TLH and TLH with cuff suspension.
- TLH to me includes laparoscopic cuff closure using the ligaments and endopelvic fascia for suspension.

LAPAROSCOPIC HYSTERECTOMY
–Definition 1988
- Laparoscopic ligation of the blood supply to the uterus prior to its removal

Laparoscopic assisted vaginal hysterectomy (LAVH)
- A vaginal hysterectomy
- after laparoscopic adhesiolysis, endometriosis excision, or oophorectomy.
- Really a marketing term invented by Industry to convince gyns to use their expensive instruments for hysterectomy.

What is a TLH?
- Continuation of the hysterectomy process to include
- 360° culdotomy
- Cuff repair from above
- That’s it, folks!
- Simple, right?
**TLH Steps**

- Intraumbilical incision
- 2 lower abdominal lateral incisions
- Bladder flap
- Vessel ligation: 4 major vessels
- 360 degree culdotomy
- Morcellation
- Vaginal cuff suspension
- Cysto &/or ureterolysis

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**What is a TLH?**

- Doing the whole operation laparoscopically
- **YES & NO**

---

**Does the “whole” operation just mean taking out the uterus?**

Or does it include prophylactic or indicated vaginal support repair?

Confusing!

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**What is a TLH?**

- Today, much unwarranted confusion exists.
- After 20 years there is finally a code for billing this procedure.
- Are these codes further confusing the issue?

---

**USA CPT codes**

CPT has no fewer than 37 codes to report a hysterectomy.

The wrong code can mean a substantial loss of reimbursement.
**TLH**

58570  Laparoscopy, surgical, with total hysterectomy, for uterus 250 g or less

58571  Laparoscopy, surgical, with total hysterectomy, for uterus 250 g or less; with removal of tube(s) and/or ovary(ies)

58572  Laparoscopy, surgical, with total hysterectomy, for uterus greater than 250 g

58573  Laparoscopy, surgical, with total hysterectomy, for uterus greater than 250 g; with removal of tube(s) and/or ovary(ies)

**What is a TLH?**

- These codes do not address the most important part of the operation
- It is evident that the technique of vaginal closure is not included.
- Thus, these codes are detrimental to women having this operation.

**What is a TLH?**

- There is a huge difference between closing the vagina vaginally, closing the vagina laparoscopically, and closing the vagina and its supportive ligaments laparoscopically.
- Different operations called by the same name make comparisons with other techniques and long term results impossible to distinguish.

**Industry**

- Disposable thermal energy devices
- Cuts also
- No dissection needed
- Sewing machine for cuff
- Is the vagina programmed to fall down and require another operation?
Why so much Prolapse surgery after hysterectomy?

• Should be rare if the correct approach is taken for hysterectomy!

PROLAPSE

• Yet every meeting I go to has a long session on prolapse surgery.
• I suspect INDUSTRY board rooms frequently discuss what operation to do after the uterus is out!


• 1973 to present
• 162,488 women with hysterectomy
• 470,519 without hyst
• All modes and routes of hysterectomy were associated with an increased rate of future POP surgery


• Overall risk of subsequent prolapse surgery
• Increased by 50% after TAH
• Doubled after subtotal hysterectomy
• Quadrupled after vaginal hysterectomy
My conclusion (What’s wrong with this picture)

- Some bad laparoscopic surgery being done

TLH

- Tagging the uterosacral-cardinal complex vaginally helps in their identification for cuff repair. (Vag hyst & LAVH)

- But if the ligaments are divided laparoscopically and vagina closed vaginally, it is much more difficult to identify and incorporate them into the repair.

My conclusion (What’s wrong with this picture)

- We must do better for our patients
- Vag hyst results are unacceptable
- Laparoscopic hyst with present trends will also prove unacceptable
- We have forgotten how to do total laparoscopic hysterectomy
- And perhaps abdominal hysterectomy, which I thought was the same as TLH

TLH

- Likewise, suturing just the vagina closed laparoscopically, often with expensive disposable devices, does little for support.
- I predict much future prolapse from these types of surgery that certainly are not a TLH!
Opinion:
Not a TLH if cuff repaired vaginally
And not a TLH if severed ligaments are left unattached
Vaginal morcellation is encouraged in TLH before the cuff is reattached from above by laparoscopic suturing

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TLH Steps
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Hysterectomy Technique
1. Ureteral dissection
2. Bladder mobilization
3. Upper uterine blood supply
4. Lower vessel ligation
5. Circumferential culdotomy
6. Laparoscopic vaginal vault suspension

Standardized A-B-C Approach to TLH
Ureteral Dissection
- Perhaps we better start dissecting out the ureter again.
- Especially if harmonic and/or robotics are used

Standardized A-B-C Approach to TLH
- Incisions
- Vaginal Preparation
- Exploration
- Ureteral Dissection
- Retroperitoneal Dissection
- Bladder Mobilization
- Upper Uterine Blood Supply
- Uterine Vessel Ligation
Standardized A-B-C Approach to TLH

- **Division of Cervicovaginal fascia and Circumferential Culdotomy**
- **Morcellation (Laparoscopic and Vaginal)**
- **Laparoscopic Vaginal Vault Closure and Suspension with McCall Culdeplasty**
- **Cystoscopy**
- **Underwater Examination**
- **Closure**

---

**Standardized A-B-C Approach to TLH Ureteral Dissection**

- **The laparoscopic surgeon should dissect (skeletonize) either the ureter or the uterine vessels during the performance of a laparoscopic hysterectomy or do cysto to check the ureters.**

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**Standardized A-B-C Approach to TLH Ureteral Dissection**

- **The Medial Approach (Reich)**
- **Immediately after exploration of the upper abdomen and pelvis, each ureter is isolated deep in the pelvis, when possible. Ureteral dissection is performed early before the peritoneum becomes edematous and/or opaque from irritation by the CO2.**

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**Standardized A-B-C Approach to TLH Ureteral Dissection**

- **If the uterus is anteverted, the ureter can usually be visualized in its natural position on the medial leaf of the broad ligament allowing the peritoneum immediately above it to be incised to create a “window” in the peritoneum. to make division of the IP ligament or adnexal pedicle safer.**
Standardized A-B-C Approach to TLH Ureteral Dissection

- The ureter and its overlying peritoneum are grasped deep in the pelvis below and caudad to the ovary, lateral to the uterosacral ligament. An atraumatic grasping forceps is used from the opposite sided cannula. Scissors divide peritoneum overlying the ureter and are inserted into the incision created and spread.

- Thereafter one blade of the scissors is placed on top of the ureter, its blade visualized through the peritoneum, and the peritoneum divided. In this manner, the ureter and its surrounding longitudinal endopelvic fascia sheath are dissected together away from the peritoneum without compromising blood supply.

- The Superior Approach
  This approach entails dissecting rectosigmoid left; caecum right off the pelvic brim and freeing the IP ligament vessels from the roof of the broad ligament to allow the ureter that lies below it to be identified. The ureter is found as it crosses the iliac vessels and traced into the pelvis.

- The Lateral Approach
  Use the pararectal space to identify the ureter. The tip of the laparoscope is use as a blunt dissector and is inserted alongside and just lateral to the pelvic sidewall peritoneum into the loose areolar tissue already distended by retroperitoneal CO2 until ureter and uterine vessels are identified.

- The uterus is displaced to the contralateral side to ID a pelvic sidewall triangle formed by the round ligament, the external iliac artery, and the IP ligament. The peritoneum in the middle of the triangle is incised and the broad ligament opened by separating the extraperitoneal areolar tissues. The IP ligament is pulled medially with grasping forceps to expose the ureter at the pelvic brim.
#1 (prophylactic)
Laparoscopic techniques used to prevent prolapse at the time of hysterectomy (TLH)

**Technique**

- **McCall culdeplasty every TLH.**

- “High” McCall if urinary retention to correct high cystocele.

---

**MC CALL CULDEPLASTY 1957**

enterocele repair at the time of vaginal hysterectomy

- **internal sutures**: a few nonabsorbable sutures to obliterate the enterocele sac by taking bites of both uterosacrals and bites of posterior peritoneum.

- **external sutures**: “No. 1 catgut suture from the vaginal side”.

---

**MC CALL CULDEPLASTY 1957**

enterocele repair at the time of vaginal hysterectomy

- McCall states that his method maintains vaginal length and does not narrow the vault as it obliterates the cul-de-sac.
Prophylaxis or enterocele without significant prolapse

- Call this a
- McCall
- Or
- Laparoscopic uterosacral to posterior cuff plication or suspension

#2 Repair of Prolapse at Hysterectomy

**Technique:**

- Not really a McCall.
- First stitch = McCall (posterior wall)
- Other stitches suspend lateral wall and then anterior vagina to correct high cystocele with retention.

New technique addresses both posterior and anterior vagina

- Brings the anterior vagina much higher than the posterior wall.
- Can be done in a patient with a previous hysterectomy or at the same time as hysterectomy.

Prediction:
21st century laparoscopic hysterectomy: the vaginal part may prove to be the least important part.

Conclusion:
Many problems with vaginal hysterectomy can be solved by TLH. Especially if we remember the original version of TLH which included vaginal cuff suspension by laparoscopic suturing!
Anatomic Landmarks and Avascular Planes of the Pelvis

Seth Kivnick, M.D.
Kaiser-Permanente, West Los Angeles

Objectives

• Identify anatomic landmarks useful for the safe performance of laparoscopic surgery
• Choose appropriate port sites for challenging laparoscopic cases
• Define and demonstrate the avascular planes of the pelvis
• Trace the obliterated umbilical artery back to the origin of the uterine artery

Definition of ‘Landmark’

• A point of reference that is useful for orientation in a familiar or unfamiliar environment.
• A surgeon uses landmarks throughout an operation—to achieve the procedure’s goals, operate safely and avoid injury to structures near the target organs

Surface landmarks

• Umbilicus
• Palmer’s point
  – Safe site for initial port with large pelvic masses, umbilical hernias, adhesions
  – Corresponding point on opposite side also useful
  – Avoids great vessels anterior to spinal column
• Anterior superior iliac spines
  – Lateral ports must not be lateral to ASIS
  – May help decide how far cephalad to place lateral ports

I have no financial relationships to disclose.
Where to place lateral ports

- Default position
  - Near asis (?)
  - Low enough to reach cuff for laparoscopic suturing during TLH
- Accommodation for large pathology
  - Higher for large uteri
  - At or superior to cornua to dissect adnexae
- More lateral if surgeon sits

Port locations for large uterus

Far lateral ports allow sitting

Obliterated umbilical arteries

Intraperitoneal landmarks

- Median umbilical fold
- Obliterated umbilical arteries/medial umbilical folds
- Insertion point of round ligaments
  - Internal inguinal ring
  - Entry point of inferior epigastric vessels
- Uterosacral ligaments
- Ureters
- Infundibulopelvic ligaments
- Pelvic brim

Internal inguinal ring
Uterine landmarks

• Isthmus
  – Junction of corpus and cervix
  – Ideal location for ligation of uterine vessels
  – LSH must be caudad to this point to minimize cyclic spotting
• Uterosacral ligament insertion point
  – Important for making colpotomy without separating ligaments from cuff
• Posterior fornix

Avascular spaces of the pelvis

• 1. prevesical space (of Retzius)
• 2. vesicouterine space
• 3. paravesical spaces
• 4. pararectal spaces
• 5. rectovaginal space
• 6. retrorectal space

Paravesical spaces

• Medial border: obliterated umbilical artery
• Lateral border:
  – obturator internus muscle; Obturator nerver, artery and vein
• Posterior border
  – Endopelvic fascia covering the internal iliac artery, vein and its anterior branches
• Inferior border/floor
  – Pubocervical fascia which inserts into the arcus tendineous fasciae pelvis (fascial white line)

Pararectal spaces

• Anterior border
  – Base of cardinal ligament
• Medial border
  – ureter
• Lateral border
  – Internal iliac artery

References

Exposure, Visualization and Dissection Techniques

Eve Zaritsky MD
Minimally Invasive Specialist, Kaiser Northern California

Disclosures

- I have no financial relationships to disclose.

Learning Objectives

- At the conclusion of this lecture and course participants will be better able to:
  - Develop tools to maximize exposure
  - Implement better visualization
  - Improve techniques of dissection

Exposure

- Patient set up
- Uterine Manipulator
- Surgical Technique
- Assistant

Exposure: Patient Positioning

- Take the time to set up this is crucial to your case

Exposure: Patient Positioning, Tuck Arms
### Exposure: Uterine Manipulator
- Uterine Manipulators are essential to a TLH
- Multiple types of manipulators

A manipulator provides optimal visualization of cervical-vaginal junction for colpotomy

### Exposure Techniques
- Insert video of uterus moving approx 10 sec
- Insert video of uterus upside down and outside body 10 sec

### Exposure
- Insert video approx 20 sec
- Insert video approx 20 sec

### Exposure: Assistant
- Use a dedicated team
- Your assistant can make or break you

### Visualization
- Patient preparation
- Degreed scope
- Multiple port sites and gas flow
Visualization: To Bowel Prep?

- In colorectal surgery -> Multitude of studies show there is no evidence that mechanical bowel preparation improves outcome for patients (Cochrane 2011)

- Laparoscopic Gynecology Surgery RCTs
  - No significant difference in surgical field, operative difficulty, time and postoperative complications, Significant preoperative discomfort (Pau et al 2006)
  - Minimal residue diet plus bowel prep small improvement in visualization but little clinical significance. Fasting without any preop prep is preferable alternative (Won et al 2013)

Visualization: Scopes

- Lenses
  - 10 mm
  - 5 mm
  - 0 degree
  - 30 degree
  - 45 degree
- Degreed scopes enable one to see around corners and difficult angles
- Particularly helpful for posterior colpotomy

Visualization: Scopes

- Insert brief video showing posterior colpotomy or large uteri and use of degreed scope (maybe show a 0 degree vs 30 degree)

Visualization: Port Sites

- 5 mm ports
- Left upper quadrant
- Diamond versus square configuration
- 8-10 cm apart

Visualization

- Insert video approx 20 sec
- Insert video approx 20 sec

Dissection Techniques

- Electrosurgery
- Blunt dissection
- Sharp dissection
- Other modalities
Dissection: Electrosurgery
- Insert 1-2 video approx 15 sec

Dissection: Blunt
- Video here 2 videos peanut, counter traction approximately 15 sec x 2

Dissection: Sharp
- Insert video

Dissection: Other Modalities
- Insert plasmajet video

Conclusion
- Exposure can make your surgery a more pleasant experience
- Visualization is key to avoiding complications
- Dissection and knowing anatomy are key to patient safety and good outcomes

References
ADHERENT OVARY & SCARRED BLADDER FLAP

RESAD PASIC M.D., Ph.D
Professor
Director Gynecologic Endoscopy
University of Louisville

Disclosure
Speakers Bureau: CooperSurgical, Karl Storz, Ethicon Endo-Surgery

Objectives
• Review Basic Equipment
• Review of Techniques

Dealing with Adherent Ovary
• Intra peritoneal approach by “pushing” ovaries upward
• Retroperitoneal approach

Visualization of The Ureter

Restoration of pelvic sidewall
**Retro Peritoneal Approach**

- Dissect from Lateral toward medial
- Undermine the peritoneum with the grasper
- Keep upward tension on the uterus
- Traction-counter traction
- Grasp the bladder and lift it
- Back fill the bladder

---

**Dissection of scarred bladder flap**

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**Scarred Bladder Flap**
PELVIC SIDEWALL AND URETER: KEEP YOUR “ENEMY” UNDER VISION

Susana Mafalda Oliveira Maia, MD
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DISCLOSURE

I have no financial relationships to disclose.

Objective

- Anatomy
- Nerve and vascular supply
- Injury
- Dissection

Pelvic Ureter

Parietal part

- Undersurface of the peritoneum
- Anterior surface of the psoas muscles
- 4-5 cm lateral to the inferior vena cava and aorta

At the level of the Infundibulopelvic ligament

Crosses the common iliac artery
Crosses the external iliac artery
At the level of the Uterine artery

The Hysterectomy Playbook: Pelvic Sidewall and Ureter

At the level of the Uterosacral ligament

Ureter is 1-1.5cm lateral to the uterosacral ligament

At the level of the Ureteric canal

The ureter crosses the uterine artery between the parametrium and the paracervix becoming invisible to the surgeon.

At the level of the Bladder

1. Mucosa
2. Muscle coat
3. Adventitia
4. Mesoureter
5. Supplying artery and vein
6. Adventitial vascular plexus
7. Perforating arteries
8. Mucosal vascular plexus

- Ureter enters the bladder wall obliquely forming a valve that prevents urine regurgitation
- Ureteral meatus opens at 1cm of the median ligne
- In distended bladder, ureteric openings are 5 cm apart
Vascularisation

Ureteric arteries
- Renal artery
- Ovarian artery
- Common iliac artery
- Uterine artery

Extensive anastomosing plexus within the adventitia

Innervation

Nerves arranged in 3 Groups:

- **SUPERIOR URETERIC NERVES**
  - Renal plexus
  - Superior Hypogastric Plexus (SHP)
  - Intermesenteric plexus

- **MIDDLE**
  - SHP
  - Hypogastric nerve (HN)

- **INFERIOR**
  - HN
  - Inferior Hypogastric Plexus

Ureteral injury

- 0.5 to 2.5% of pelvic surgeries
- 50 to 75% due to gynecologic surgeries
- True incidence in laparoscopic surgery is believed to be higher
- 70% of injuries diagnosed postoperatively
Iatrogenic ureteral injury

1. Mechanical injuries
   • Direct
     - Laceration
     - Transection
     - Ligation or stapling
   • Indirect
     - Kinking
     - Compression (hematoma)

2. Devascularisation

3. Thermal injury

Risk factors

• Pelvic endometriosis
• Hysterectomy: large uterus
• Oophorectomy: Large ovarian and paraovarian cysts
• Cervical or intra-broad ligament myomas
• Pelvic adhesions: previous pelvic inflammatory disease or surgeries
• Congenital anomalies: pelvic kidney, ureteric duplication

Prevention

• Knowledge of anatomy
• Preoperative Risk Stratification (Intravenous pyelography/Urinary stent?)
• Precise identification and visualisation of the ureter
• Atraumatic dissection
• Preservation of the vascular network
Ureteral injury prevention

Uterine manipulator

Ureteral injury prevention

Ureter dissection

- Gentle manipulation
- Avoid pulling/pushing the ureter
- Avoid holding the ureter with grasper
- Useatraumatic forceps
- No Monopolar dissection
- Bipolar coagulation: precise and short electricity delivery

Ureteral injury prevention

Ureteral injury

Diagnosis

**Peroperatively**

- Intravenous dye injection or retrograde bladder/ureteral dye injection using indigo carmine or methylene blue
- Cystoscopic examination (may not detect partial transection or thermal injury)
- Retrograde catheterisation under laparoscopic control
- Retrograde pyelogram

Only 7.25% of the injuries are diagnosed peroperatively

**Postoperatively**

- Physical examination and laboratory investigations
- Renal ultrasound
- Computed tomography urogram with intravenous contrast
- Retrograde pyelogram

Ureteral injury prevention

Ureteral injury

Management

**Timing of injury recognition**

- Intraoperatively: immediate repair
- Postoperatively: postpone surgical treatment with percutaneous nephrostomy

**Mechanism of injury**

- Partial ureteral ligation: temporary stent placement
- Complete ureteral ligation or thermal injury: resection of the involved segment
- Ureteral transection: percutaneous nephrostomy with delayed repair

**Location of injury**

- Upper third: ureteroureterostomy
- Middle third: ureteroureterostomy with tension free anastomosis/Boari flap
- Pelvic ureter: ureteroneocystostomy

Ureteral injury prevention

Ureteral injury

Conclusion

- Knowledge of anatomy
- Preoperative evaluation in difficult cases
- Apply dissection rules
- Recognize and repair injury

The best way to prevent complications is to avoid them
Or if happen to diagnose them intra operatively

References

- Kamina Anatomie Operatoire Gyneco & Obst. Edit Maloine 2000
- Rosemarie Fröber et al; Surgical anatomy of the ureter, BJU International, Volume 100, Issue 4, pages 949–965, October 2007
- Causes and prevention of laparoscopic ureter injuries: an analysis of 31 cases during laparoscopic hysterectomy in the Netherlands
Thank you for your attention!
Minimally Invasive Procedures in the Obese Patient, Previous Surgery and Challenging Anatomy - What are our adjustments?

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Disclosure

• I have no financial relationships to disclose.

Obesity in America

• 58% of the world’s adult population will be overweight by 2030
• • As of 2010, 28% of women obese globally
• – WHO identified obesity as 6th most significant cause of ill health

Costs and Complications Related to Obesity

• Treating obesity and its complications in U.S. approximates $100 billion/year
– Overall mortality rises 30% for each 5 kg/m2 increase in BMI

• Morbid obesity associated with major postoperative complications (OR 1.77) in cross sectional analysis of 22,214 women undergoing gynecologic procedures
– Infection rates between 4-12% after abdominal hysterectomy (BMI>30) to as high as 30% in BMI>50

• $3400 additional costs per person
– Conversion rates of 8-36% from laparoscopy to laparotomy in uterine cancer staging
Virtually all procedures are safe! Practically all of the procedures commonly performed in women of normal weight have been studied and found to be safe in obese patients.

Evaluation of the Patient

- Short stature or truncal obesity may increase abdominal wall thickness out of proportion to patient weight.
- Routine evaluation of the abdominal wall prior to laparoscopy is important because it entry may need altering based on abdominal wall thickness.

Preoperative Evaluation

- Extensive patient counseling is essential in morbidly obese patients.
- Discuss possible interventions such as additional intravenous access (to extremities, IJ and central lines), panniculus repositioning, and conversion to laparotomy.
- Expectations for postoperative recovery depends on early ambulation and avoidance of the supine position.

Anaesthesia

- A recent study compared 8 morbidly obese patients with 9 normal-weight controls and confirmed previous evidence that morbidly obese, supine, anesthetized patients have a 68% increase in inspiratory resistance and a 30% decrease in static pulmonary compliance, compared with controls.
- Pneumoperitoneum further increases this resistance and diminishes compliance.

Physiologic Adjustments

- Additional risk for altered respiratory physiologic condition.
- Excess body weight around the ribs, under the diaphragm, and intra-abdominally causes reduced chest wall compliance.
- There is lower expiratory reserve volume and decreased functional residual capacity (FRC).
- The supine position in normal weight patients can reduce FRC by approximately 25%.
- Anesthesia reduces FRC by an additional 20%.
- In the obese patient, supine positioning and anesthesia can decrease to levels lower than closing capacity.
Anesthesia in the Obese Patient

- Inhalation agents
  - No difference in outcome or hospital course for bariatric patients
- Intravenous anesthesia
  - Preoperative and intraoperative alpha-2 agonists (clonidine, dexmedetomidine) can reduce opioid requirements
- Neuraxial anesthesia
  - Sympathetic blockade to higher levels due to smaller spinal component
  - More epidural adipose tissue results in greater technical difficulty
  - Less respiratory failure & faster return to baseline vital capacity and FEV1
- Multimodal approach preferred

Strategize The Surgical Approach

- Patients with large adipose tissue centered on their waist are likely to be more technically challenging than patients whose adipose is centered on the hips.
- Trocar placement may be hindered by increased thickness and lack of mobility.
- The pannus should also be evaluated prior to prepping the pt for repositioning with the use of traction with weights or tape.

Optimizing Intraop Care Before the Case

- Once the patient is intubated and positioned, place the patient in steep Trendelenburg for 2 to 5 min
- Have anaesthesia observe the patient’s cardiac and respiratory status.
- Then repeat once the patient is insufflated and pneumoperitoneum is established.
- If the patient is able to maintain inspiratory pressures at 30 to 40 mm Hg during this evaluation, the patient will most likely sustain these pressures.

Case: TLH/BSO for endometrial hyperplasia

Height: 5’5”  Weight: 404  BMI: 67.2
Trocar Placement

- Obesity increases the distance between skin and fascia, and can increase the distance between fascia and peritoneum.
- Preperitoneal insufflation of gas can occur with wrong placement of the Veress needle.
- The Hasson approach sometimes requires difficult dissection, incision extension and increases the risk of postoperative wound infection.
- Use of Bariatric instruments
  - Long Veress (15 cm)
  - 45 cm bariatric vs standard 33 cm

Robotics in Morbidly Obese Patients

- Allows for easier laparoscopic maneuvering.
- Increased thickness of subcutaneous tissue in obese patients, cases can be physically demanding for the surgeon.
- The robotic system diminishes surgeon strain.
- Also can potentially reduce trauma to the subcutaneous tissue by utilizing the fulcrum of robotic port placement.

Major Vessel Anatomy

- Obesity changes the relationship of the umbilicus to the aortic bifurcation.
- The umbilicus migrates caudally in relation to the aortic bifurcation as the BMI increases.
- In nonobese patients (BMI <25), the umbilicus had a median location 0.4 cm caudal to the bifurcation. In 33% of patients, the umbilicus was actually cephalad to the aortic bifurcation.
- In overweight (BMI 25 to 30) and obese (BMI >30) patients, the umbilicus had a median location 2.4 and 2.9 cm caudal to the aortic bifurcation, respectively.
- However, in both groups, the umbilicus was directly over the aortic bifurcation in 30% of patients.
Distance from Bifurcation

- In a study, using CT imaging, the distance between the umbilicus and peritoneum at a 45° angle from the umbilicus into the pelvis, in both nonobese and overweight patients, was only 2 cm.

- In obese patients, this distance increased to a median of 12 cm.

- The distance between the umbilicus and the underlying vessels was only 6 cm at a 90° angle in nonobese patients.

- This averaged 13 cm in obese patients.

Veress Needle Insertion

- To optimize intraperitoneal Veress needle and trocar placement, use a 45° angle from the umbilicus toward the pelvis in nonobese patients and a 90° approach in obese patients.

- In overweight patients, this angle should range between 45° and 90°.

Trocar and Veress Needle Placement

Pneumoperitoneum

- Left upper quadrant entry (mean umbilical thickness 3.0 vs 4.4 cm)

- Umbilicus pulled downward with pannus so consider supraumbilical incision for camera.

- Side docking for robotic cases to allow access to vagina.

Insufflation

- In the morbidly obese, insufflation pressure of 15 mm Hg will sometimes produce poor visualization.

- Obese patients generally tolerate 15mm Hg well so try 18-25mm Hg with insufflation until the trocars are inserted for improvement of visualization.

- Also utilize the LEFT UPPER QUADRANT!!
**Thromboembolic Prophylaxis**

- Data sparse on whether weight based or fixed doses of LMW heparins should be given in extreme obesity
  - Enoxaparin, dalteparin, tinzaparin all equally efficacious if <165 kg
- Meta-analysis in patients undergoing cancer surgery concluded no difference between LMW heparin and UFH in terms of efficacy, DVT location, or bleeding complications.
- Optimal interval 6-8 hours postoperatively.
- Although early meta-analysis and literature review indicated that aspirin reduced VTE incidence by 20%, ACCP Guidelines as of 2008 recommend against aspirin alone.

**Pharmacokinetics**

- Pharmacokinetics should also be given special consideration in obese patients.
  - These patients have a smaller than normal fraction of total body water, greater than normal adipose tissue content, and increased blood volume, volume distribution, and renal blood flow.
- Drug distribution and effect may be different in this patient population.
- Consider increasing dosages of prophylactic antibiotics prior to procedures.

**Postoperative Care in Obese Patients**

- Analgesia with local anesthetics via epidural may be safest approach
  - More respiratory depression with intrathecal opioids
- Use acetaminophen and NSAIDs to reduce narcotic consumption
- Consider antacid, H2 antagonist, or prokinetic agent to decrease gastric acidity and facilitate emptying
- Start ACE inhibitor or calcium channel blocker for uncontrolled hypertension
- Initiate early physical therapy for those with mobility limitations

**Visualization**

- Major advantage of laparoscopy is the precise and magnified visualization
  - Can be enhanced with the 30-degree laparoscope
- Optimal images are obtained by the direction that the scope is facing and by the angle of the lens, as determined by the orientation of the light cord

**DVT prophylaxis**

- Obesity and gynecologic surgery are risk factors for deep venous thrombosis, therefore, use sequential compression devices on the lower extremities, beginning before induction of anesthesia.
Distortion can
- limit exposure
- increase the risk of organ injury
- create technical difficulty

The use of manipulators can increase
- mobility of the uterus
- help access pedicles and fornices

Lysis of Adhesions
- Adhesions may be
  - filmy and avascular
  - filmy and vascular or
  - dense, fibrous and vascular
- Scissors are the preferred instrument
- Thermal energy sources must be avoided
- Adhesions are easier to divide when working above them, instead of within them

Lysis of Adhesions
- The technique includes insertion with closed scissors and withdrawing them in the open position
- Adhesions can also be bluntly divided by grasping the adhesion in the partially closed scissors and gently pushing the tissue
- Pressing the abdominal wall from above can make it accessible to the scissors
Conclusion

• Creating a systemic approach to assessing the patient after the completion of each procedure before desufflation

• Listen to the patient! Early recognition of laparoscopic complications with rapid triage and immediate evaluation can save time in the end

• Delays in treatment cause “complications of a complication”

• Knowing how to manage complications is important, but knowing how to avoid them is prudent and intelligent.

Conclusion

• Make your approach comprehensive
• Always consider alternatives and multiple approaches
• Appreciate physiologic and anatomic differences
• Understanding the basics of surgical principles

• Questions
Broad Ligament and Cervical Fibroids
Seth Kivnick, M.D.
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Objectives
• Be able to diagnosis and treat of broad ligament and cervical fibroids
• Review physical and imaging findings
• Review principles of safe surgical removal of such fibroids
• Video examples of successful operations for these lesions

Broad ligament fibroids
• True: arise from muscle fibers within broad ligament
  – From round ligament, ovarian ligament or muscle fibers near ovary
  – No attachment to uterus
  – Covered only by leaves of broad ligament
• False: arise from the uterus and grow laterally, between the leaves of the broad ligament
  – Make it more difficult to access isthmus, vessels

I have no financial relationships to disclose.

Broad ligament fibroids
• Suspect on pelvic exam if cervix is displaced laterally, especially if uterus is wide at isthmus
• Can’t tell from MRI if a lateral fibroid is between the leaves of the broad ligament or not
• At surgery: round ligament and/or ovarian ligament are stretched over fibroid
Broad ligament fibroid

- Keys to surgery
  - Open the broad ligament—usually thru round
  - Peel away leaves of broad ligament, bladder, adjacent vessels
  - Avoid ureteral injury
  - Lift fibroid cephalad to access isthmus
    - Screw, tenaculum, suction cannula
  - For LH, may need to do myomectomy first to reach uterine vessels at isthmus

Cervical fibroid MRI

Cervical fibroids

- Unusual (<5% of fibroids)
- Close to bladder, ureters, uterine arteries
- Either within the cervical stroma or between stroma and serosa
- Exam
  - Wide cervix, often effaced
  - Attached to cervix (as opposed to prolapsing submucous fibroid)

Cervical fibroids

- Ascertain location of fibroid in relation to endocervical canal
- Make incision on side opposite canal
- For LH, remove fibroid first then complete hyst
- Strategies to minimize blood loss
  - U.A.E. (gelfoam?)
  - Ligation or clipping of uterine arteries at origin
  - Temporary placement of arterial balloon catheters
  - Medication (depo Lupron, pitressin; misoprostol?)

Cervical myomectomy

- Mark endocervical canal with sound or dye
- When fibroid is within stroma, reconstruct cervix
  - Mark/preserve endocervix
  - Close dead space
  - Bring proximal and distal stroma together
  - Multiple layers for strength?
- Data on later obstetrical performance?
References

CUFF CLOSURE TECHNIQUES
PREVENTION OF DEHISCENCE & PROLAPSE

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Disclosure
Speakers Bureau: CooperSurgical, Karl Storz, Ethicon Endo-Surgery

Objectives

• Review Basic Equipment
• Colpotomy Techniques
• Colpotomy Closure Techniques
• Vaginal Apex suspension Techniques

Prevention of Apical Prolapse

Where Should Sutures be Placed?

Etiology of Pelvic Support Defects

<table>
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<th>Age</th>
<th>Gravidaity</th>
<th>Parity</th>
<th>Number of SVDs</th>
<th>Wt of largest SVD</th>
<th>BMI</th>
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<td>Menopausal Status</td>
<td>Race</td>
<td>Medical Hx – chronic dz</td>
<td>HTN</td>
<td>COPD</td>
<td>Diabetes</td>
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<tr>
<td>Previous Hysterectomy</td>
<td>Previous POP Surgery</td>
<td>Incontinence Surgery</td>
<td>Smoking</td>
<td>Family Hx (Genetics)</td>
<td>Constipation</td>
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</tbody>
</table>

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Total Laparoscopic Hysterectomy

Colpotomy Technique

Colpotomy Technique

Colpotomy Technique

What the Future Brings

Cuff Closure
Background

- Vaginal cuff dehiscence is a serious though rare complication of hysterectomy
  - Incidence 0.14-4.1%
  - Studies including only robotic hysterectomy and TLH report higher rates (1-4.1%)
- May occur 3 days to 30 years post-operatively
- Mean time to cuff dehiscence in larger retrospective cohort studies and case series: 6.1 wks to 1.6 yrs
  - May be a shorter interval in patients s/p TLH
- Presentation: pain (58-100%), bleeding or discharge (33-90%)
- Evisceration may occur, increasing morbidity

Risk Factors

- Age
  - Mean age = 48.3
- Number of vaginal surgeries
- Vaginal atrophy
- Increased valsalva testing
  - Chronic cough
- Poor wound healing
  - Malignancy, diabetes, tobacco use
- Post-operative infections
Risk Factors

- Mode of hysterectomy
  - 50% reported cases occurred after TLH/robotic cases
  - Method of colpotomy and cuff closure in MIS cases postulated to be an etiology for this higher incidence
  - Use of electrocautery
  - Smaller tissue bites due to magnification
  - Intracorporeal vs. extracorporeal knot tying
  - 1 versus 2 layer closures
  - Use of bidirectional barbed suture

How Can I Support the Apex?

- Round Ligament
- Sacrospinous Ligament
- Fascia of iliococcygeus muscles
- Uterosacral Ligaments
- Sacral Promontory

Reconstructive Surgery for Pelvic Organ Prolapse

KEYS TO SUCCESS:

- Support the vaginal apex
- Maintain the vaginal axis

USL Plication

Laparoscopic Sacral Colpopexy

Sacral Colpopexy Data

- “Gold standard” success rate: 78-100%
- Occurrence of failures: 81% at 1yr, 95% at 2yrs
- Rate of mesh erosion: 0.8-3.4%
- Risk of Spontaneous Bowel Obstruction 1%
- Polypropylene mesh is superior to fascia lata (91% vs 68%)
- Laparoscopic and open approaches appear to have equal efficacy
Obliterated Cul-de-Sac and Rectovaginal Nodule

Harry Reich
(hrlscp@aol.com)

Disclosure

- Stockholder: Encision Inc.
- Other: Royalty: CooperSurgical

Endometriosis
Hysterectomy

- Too often associated with taking out the ovaries & the normal part of the uterus while leaving behind the disease
- First excise the endo.
- Then do the hyst (TLH)
- Ovarian preservation??
- Never supracervical or LAVH or intrafascial
- Must reduce cuff persistence & adhesions by excising the endo there

Endometriosis Surgery

- Omentolysis & Small bowel enterolysis
- Rectosigmoid enterolysis
- Ureterolysis
- Cul-de-sac dissection
- Excision of the deep fibrotic endometriosis: anterior rectum, post vagina/cervix, and uterosacral ligaments
New techniques for good surgery (really old)

- Cold scissors with microbipolar backup
- Minimal cautery
- Underwater exam
- No drains

What do we mean by cure rate?

Surgery. All stages. >50% cure

- Wheeler and Malinak ’87 66% cure
- Redwine: 57% ’91
- Abbott on Garry: 56% cure including all stages
- Vignali
- Busacca
- Saleh & Tulandi

Wheeler and Malinak (5) in 1987
Pioneering follow-up study of conservative surgical excision at laparotomy

- Meticulous excision of all visible endometriotic implants at laparotomy in 423 patients, then determined long-term outcome by direct office follow-up, regeneration, or contact by researchers.
- Life-table analysis was used to analyze their data. Stage of disease was not specified.
- 62 patients had recurrence of pain severe enough to have repeat surgery, and of those, only 21 had recurrent or persistent endometriosis at surgery, for a surgically proven cure rate of 66%.
- Using the life-table data, by 5 years postop there was a 19% risk of a surgical diagnosis of endometriosis.
- 350 (82.7%) patients were lost to followup during the study.

First presentation on cure rates after laparoscopic cul-de-sac surgery 1988

Laparoscopic treatment of cul-de-sac obliteration secondary to endometriosis.

Reich H: Laparoscopic treatment of cul-de-sac obliteration secondary to retrocervical deep fibrotic endometriosis.

- 100 cases of cul-de-sac obliteration
- Reich reported 67% persistant endometriosis (20 of 30) after extensive excision surgery for cul-de-sac obliteration treatment done by laparoscopy between 1983 and 1988. Histologically documented cure rate of 33%.
**Endometriosis**

- Not a malignancy
- Can involve any pelvic organ, including bowel, rectum, bladder, ureters
- Radical surgery is mandatory?
- Necessitates advanced training such as for malignancy surgery
WHAT KIND OF SURGERY ON THE BOWEL?

• SHAVING
• DISC EXCISION
• SEGMENTAL RESECTION
Rectosigmoid resection

- Excision works for bladder, posterior uterus and vaginal endo
- And ovarian
- And peritoneal

- We have never tried to excise all of the rectal disease
- That may be our future!

TLH Steps

- Intraumbilical incision
- 2 lower abdominal lateral incisions
- Bladder flap
- Vessel ligation: 4 major vessels
- 360 degree culdotomy
- Morcellation
- Vaginal cuff suspension
- Cysto &/or ureterolysis

What are the latest emerging techniques in minimally invasive care for women? And what are the results?

- Endometriosis surgery is almost ready for prime time. We must educate the public that this is the most complex surgery and should not be done by surgeons without special training.

What are the future perspectives of the endometriosis in the world?

- Future is difficult to predict.
- Long term, there may be a pharmaceutical agent to modify and eradicate endometriosis.
- Very long term!
- Now we know that excision works best. Will rectal resection become a part of this treatment? We are awaiting for the answers.

Endometriosis, though a complex disease, is the most common condition a gynecological surgeon deals with after ovarian cysts.

- Cancer treatment will stay with the gyn oncologist. Pelvic support with the urogynecologist. All this despite expertise by the laparoscopic surgeon.
- We have endometriosis. Let’s not let it escape!
Governor Arnold Schwarzenegger signed into law AB 1195 (eff. 7/1/06) requiring local CME providers, such as the AAGL, to assist in enhancing the cultural and linguistic competency of California’s physicians (researchers and doctors without patient contact are exempt). This mandate follows the federal Civil Rights Act of 1964, Executive Order 13166 (2000) and the Dymally-Alatorre Bilingual Services Act (1973), all of which recognize, as confirmed by the US Census Bureau, that substantial numbers of patients possess limited English proficiency (LEP).

California Business & Professions Code §2190.1(c)(3) requires a review and explanation of the laws identified above so as to fulfill AAGL’s obligations pursuant to California law. Additional guidance is provided by the Institute for Medical Quality at [http://www.imq.org](http://www.imq.org).

**Title VI of the Civil Rights Act of 1964** prohibits recipients of federal financial assistance from discriminating against or otherwise excluding individuals on the basis of race, color, or national origin in any of their activities. In 1974, the US Supreme Court recognized LEP individuals as potential victims of national origin discrimination. In all situations, federal agencies are required to assess the number or proportion of LEP individuals in the eligible service population, the frequency with which they come into contact with the program, the importance of the services, and the resources available to the recipient, including the mix of oral and written language services. Additional details may be found in the Department of Justice Policy Guidance Document: Enforcement of Title VI of the Civil Rights Act of 1964 [http://www.usdoj.gov/crt/cor/pubs.htm](http://www.usdoj.gov/crt/cor/pubs.htm).

**Executive Order 13166, “Improving Access to Services for Persons with Limited English Proficiency”,** signed by the President on August 11, 2000 [http://www.usdoj.gov/crt/cor/13166.htm](http://www.usdoj.gov/crt/cor/13166.htm) was the genesis of the Guidance Document mentioned above. The Executive Order requires all federal agencies, including those which provide federal financial assistance, to examine the services they provide, identify any need for services to LEP individuals, and develop and implement a system to provide those services so LEP persons can have meaningful access.

**Dymally-Alatorre Bilingual Services Act** (California Government Code §7290 et seq.) requires every California state agency which either provides information to, or has contact with, the public to provide bilingual interpreters as well as translated materials explaining those services whenever the local agency serves LEP members of a group whose numbers exceed 5% of the general population.

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