Vaginal Hysterectomy:
Mastering the SINGLE and CONCEALED – Incision Approach (Didactic)

PROGRAM CHAIR
Rosanne M. Kho, MD

Barbara S. Levy, MD        Marie Fidela R. Paraiso, MD        Kevin J.E. Stepp, MD
Professional Education Information

Target Audience
Educational activities are developed to meet the needs of surgical gynecologists in practice and in training, as well as, other allied healthcare professionals in the field of gynecology.

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Vaginal Hysterectomy: Mastering the SINGLE and CONCEALED – Incision Approach (Didactic)

Rosanne M. Kho, Chair
Faculty: Barbara S. Levy, Marie Fidela R. Paraiso, Kevin J.E. Stepp

Course Description

This course provides a unique opportunity to master the LEAST minimally invasive approach to hysterectomy, the vaginal hysterectomy. From the leading experts in the field, the participant will understand from evidence in the literature why vaginal hysterectomy is the PREFERRED approach. Step-by-step didactics and videos will be used to demonstrate basic and advanced surgical techniques, innovations and currently available devices to simplify and overcome the challenges to the procedure. Additional focus will be provided on vaginal removal of the adnexae, support of the vaginal apex at the time of the hysterectomy and management of complications. The attendees will come away from the course filling their surgical armamentarium with vaginal skills to become the complete pelvic surgeon.

Course Objectives

At the conclusion of this course, the participant will be able to: 1) Articulate advantages to the vaginal approach with evidence from the literature; 2) develop a new patient selection criteria for the vaginal hysterectomy; 3) identify the challenges to the vaginal hysterectomy and employ specific techniques to overcome each; 4) articulate the steps to remove the adnexae vaginally; 5) demonstrate techniques to prevent, recognize and manage complications associated with vaginal hysterectomy; and 6) implement procedures to support the vaginal apex at the time of the hysterectomy.

Course Outline

8:00    Welcome, Introductions and Course Overview    R.M. Kho
8:05    Vaginal Hysterectomy, PREFERRED Approach: What the Evidence Shows and Step-by-Step Guide    B.S. Levy
8:30    Use of Surgical Innovation to Overcome Challenges in Difficult Vaginal Cases    R.M. Kho
8:55    Complications in Vaginal Procedures: Recognition and Management    M.F.R. Paraiso
9:20    Support of the Vaginal Apex during Hysterectomy    K.J.E. Stepp
9:45    Questions & Answers    All Faculty
9:55    Break
10:10   Structural and Functional Support to the Female Pelvis    K.J.E. Stepp
10:35   Vaginal Adnexectomy: Maximizing Success and Safety    R.M. Kho
11:00 Intra-Operative Cystoscopy: Role, Technique, Normal and Abnormal Findings
M.F.R. Paraiso

11:25 Evidence-Based Management for Same-Day Discharge after Hysterectomy
B.S. Levy

11:50 Questions & Answers
All Faculty

12:00 Course Evaluation
PLANNER DISCLOSURE
The following members of AAGL have been involved in the educational planning of this workshop and have no conflict of interest to disclose (in alphabetical order by last name).
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Viviane F. Connor
Consultant: Conceptus Incorporated
Frank D. Loffer, Executive Vice President/Medical Director, AAGL*
Linda Michels, Executive Director, AAGL*
Jonathan Solnik
Other: Lecturer - Olympus, Lecturer - Karl Storz Endoscopy-America

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Other: Royalties - CooperSurgical
Linda Bradley
Grants/Research Support: Elsevier
Consultant: Bayer Healthcare Corp., Conceptus Incorporated, Ferring Pharmaceuticals
Speaker’s Bureau: Bayer Healthcare Corp., Conceptus Incorporated, Ferring Pharm
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Consultant: Karl Storz Endoscopy
Rosanne M. Kho
Other: Honorarium - Ethicon Endo-Surgery
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Javier Magrina*
Ceana H. Nezhat
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Speaker’s Bureau: Conceptus Incorporated, Ethicon Women’s Health & Urology
William H. Parker
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Consultant: Ethicon Women’s Health & Urology
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Other: Proctor - Intuitive Surgical

FACULTY DISCLOSURE
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Barbara S. Levy
Consultant: Conceptus Incorporated, Gynesonics, Halt Medical
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Kevin J.E. Stepp
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Stock Shareholder: Titan Medical
Speaker’s Bureau: Covidien, Stryker Endoscopy
William W. Hurd*

Asterisk (*) denotes no financial relationships to disclose.
Vaginal Hysterectomy: Preferred Approach: What the evidence shows

Barbara Levy MD FACOG, FACS
Vice President, Health Policy
American College of Obstetricians and Gynecologists

Learning Objectives

• Describe optimal approach for hysterectomy
• Demonstrate techniques to perform vaginal hysterectomy in most patients
• Describe approaches for obese women to facilitate a vaginal approach
• Describe how to avoid complications

“You must be the change you wish to see in the world.”
Gandhi

Current International Guidelines

• Cochrane analysis – Update July 2009 with more laparoscopic hyst studies
  Niebuhr et al Cochrane Database Syst Rev 2009 CD003677
• ACOG Educational Bulletin – Nov 2009
  Obstetric Gynecol 2009;114:1156

Vaginal hysterectomy should be the procedure of choice when technically feasible.
**HYSTERECTOMY**

- 1997 STATISTICS: 598,929 CASES
- ABDOMINAL: 63%
- LAPAROSCOPIC: 9.9%
- VAGINAL: 23.3%
- SUBTOTAL: 2.0%
- RADICAL: 1.5%

**Contraindications to the Vaginal Approach - Traditional**

- Carcinoma
- Previous pelvic surgery
- Nulliparity or no prior vag delivery
- Enlarged uterus
- Need for adnexectomy
- Pelvic pain
- Endometriosis
- Inaccessibility – arch <90 degrees or vaginal stenosis

**Evidence-Based Contraindications to Vaginal Hysterectomy**

- Malignancy
- Undiagnosed pelvic mass
- Inability to access the uterine vessels

**Complications of Hysterectomy**

<table>
<thead>
<tr>
<th>Type of Complication</th>
<th>Vaginal Hysterectomy (N=7820)</th>
<th>Abdominal Hysterectomy (N=37,313)</th>
<th>Laparoscopically Assisted Vaginal Hysterectomy (N=117,136)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>1.2%</td>
<td>0.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>1.9%</td>
<td>0.6%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Urinary tract</td>
<td>0.8%</td>
<td>1.9%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Bleeding</td>
<td>1.4%</td>
<td>1.4%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Accidental puncture</td>
<td>0.9%</td>
<td>1.0%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Epilceration</td>
<td>0.2%</td>
<td>0.03%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Postoperative infection</td>
<td>7.0%</td>
<td>0.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Unspecified</td>
<td>2.3%</td>
<td>1.8%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Total</td>
<td>9.1%</td>
<td>7.8%</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

P< 0.001 for all comparisons between groups. Some patients had more than one type of complication.

**Relentlessly pursue simplicity**

Surgical check lists and comparison to other industries supports the value of standardization in approach and technique.

Variations lead to errors and complications.
Avoidance of Complications

• Careful patient positioning
• DVT prophylaxis
• 1 dose 1st generation cephalosporin
• Meticulous hemostasis
• Careful tissue handling
• Early ambulation
• Avoid indwelling catheter

Tricks in Performing Difficult Vaginal Surgery - Positioning

• Carefully position the patient with the buttocks over the edge of the table to gain optimal exposure – avoid hyperflexion or significant external rotation at the hip to reduce femoral nerve injury
• Place padding under the sacrum in extremely thin women to reduce the risk of sciatic injury.

Surgical practice – defined by our tools

Minimally Invasive Surgery

• Innovation dependent upon manufacturers’ support and development
• New tools facilitated new procedures and approaches

Visualization is Key

• Laparoscopy taught us the advantage of great light and visualization
• Robotics with 3-D is an extension of this
• VAGINAL surgery permits hands-on surgery with optimal ability to handle tissue if the obstacle of good visibility can be overcome

Tricks in Performing Vaginal Surgery - Visualization

Use a fiberoptic light source to increase visualization – with suction and irrigation to maximize clarity and precision
Methods of Achieving Hemostasis

- Suture
- Laser
- Vessel sealing
- Pulsed Bipolar coagulation
- Ultrasonic energy application

New Methods of Achieving Hemostasis

- Eliminate need to suture in tight spaces
  - Control vessels 1 mm to 7 mm in diameter
  - Manage pedicles without isolation and dissection reducing necrotic tissue
  - Randomized trials confirm reduced OR time and post-operative pain

H&E Stained Renal Artery Longitudinal Section

Note the fused lumen of the vessel walls

Tricks in Performing Vaginal Surgery - Access

ELIMINATE side wall retractors – they restrict mobility and cause soft tissue injury – use the suction-irrigator to gently retract tissue

- Use the shortest weighted speculum available to reduce the distance to the cervix.
- In patients with large buttocks or an upper vaginal ring, consider using a narrow Deaver retractor to gain access to the posterior cul de sac.
Tricks in Performing Vaginal Surgery

• Learn to morcellate, core or split the uterus while maintaining anatomic orientation.

• A mobile uterus OF ANY SIZE can be removed vaginally if:
  – The uterine vessels are accessible
  – Morcellation of myomas can be accomplished

Tricks in Performing Difficult Vaginal Surgery - Safety

• Routinely use intravenous indigo carmine dye to identify bladder injuries early
• Consider routine cystoscopy to identify ureteral obstruction (will NOT identify all injuries)

Decision Points for Attempting Vaginal Hysterectomy

• Patient desires a vaginal approach
• Uterus is accessible and mobile
• No unknown adnexal pathology
• Pubic angle > 90°
• Adequate surgical training and experience

Step by Step Approach

• Infiltrate the uterosacral ligaments for hemostasis and pain management
• Traction for colpotomy
• Isolate and control uterosacral ligaments
• Control the blood supply using sealing technology
• Enter anterior cul de sac as visibility and descensus permit

Step by step....

• Decrease fundal bulk as required
• Control round and utero-ovarian ligaments – infundibulopelvic ligaments if desired
• RESTORE APICAL SUPPORT by attaching uterosacral/cardinal complex to the cuff
Critically Analyze Studies
Candiani et al Am J Obstet Gynecol 2009;200
Prospective randomized trial of VH vs TLH
N=60
• Patients were operated upon using “standard technique”
• What is “standard” for vag hyst?
• Heaney technique was used – ie all pedicles were controlled with suture
• Times were shorter for VH, BUT mean was 82 minutes!

Critically Analyze Studies
Candiani, et al.
• Reduced blood loss at TLH - due to laparoscopy or to vessel control technique?
• Study conclusions difficult to understand – why would there be less pain and lower blood loss with a longer procedure that requires additional incisions?

Benefits to Vaginal Hysterectomy
• Reduced cost
• Shorter length of stay
• Improved cosmetic result
• Lower complication rates
• Improved post-operative pelvic support? Not substantiated by case control studies of poor quality

Conclusion
- Where an attempt at vaginal hysterectomy is not contraindicated by evidence-based concerns, use of the laparoscope (or the robot) adds unnecessary expense, time and morbidity
- Technological advances permit safe vaginal hysterectomy in the vast majority of cases

References
Niebuhr et al Cochrane Database Syst Rev 2009 CD003677
Obstet Gynecol 2009;114:1156
ACOG Committee Opinion Number 444 Obstetric Gynecol 2009;114:1156
Candiani et al Am J Obstet Gynecol 2009;200 Prospective randomized trial of VH vs TLH
Keeping vaginal hysterectomy alive: Use of surgical innovation

Rosanne M. Kho, MD
Associate Professor
MIGS Fellowship Program Director
Dept of Gyn Surgery
Mayo Clinic in AZ

Objectives: to define:
- new selection criteria
- challenges to vaginal approach
- Use of surgical innovation and techniques to overcome challenges
- Surgical video

US hysterectomy rates

<table>
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<th></th>
<th>Open (%)</th>
<th>Vaginal (%)</th>
<th>Laparoscopic (%)</th>
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<tr>
<td>1990*</td>
<td>75.7</td>
<td>24</td>
<td>0.3</td>
</tr>
<tr>
<td>1997*</td>
<td>65</td>
<td>28</td>
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<td>2003**</td>
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<td>2005***</td>
<td>64</td>
<td>22</td>
<td>14</td>
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</table>


Financial Disclosures
- Other: Honorarium - Ethicon Endo-Surgery

Dr Jason Wright, personal communication, Aug 2012

N = 264,758 hysterectomies at 443 US hospitals 2007-2010
US vaginal surgeries performed

- >80% surgeons perform less than 5 vaginal surgeries per year
- <5% surgeons perform more than 10 vaginal surgeries per year

Rogo-Gupta et al. Ob Gyn 2010;116:1341

Traditional “contraindications” to the vaginal route

- Previous pelvic surgeries
- Adnexal mass
- Nulliparity
- >12 weeks’ size uterus

Mayo Clinic AZ: Criteria to Determine Route

- Suspicious adnexal mass
- Need to excise endometriosis
- Level of suspicion for malignancy
- Endometrial cancer
- Early stage
- Not requiring morcellation

Criteria to determine route
Level of suspicion for Malignancy

- Uterine sarcoma
- MRI w/ gadolinium
- Total LDH & isoenzyme type 3
- Goto et al. IJGynCA 2002, 12, 354

Technical Challenges in VH

- Exposure
- Hemostasis
- Entry into the anterior cul de sac
- Large uterus
- Avoiding bladder/ureteral injury

Exposure: Magrina-Bookwalter Vaginal Retractor
Technical Challenges in VH
- Exposure
  - Magrina-Bookwalter Vaginal Retractor (Codman)
  - fiberoptic light
  - Large pack to keep bowel up
  - Modified long/extra long deavers
  - LONG instruments

Exposure: Gaining vaginal access
- 1° episiotomy

Technical Challenges in VH
- Hemostasis
  - Vessel-sealing device
  - Grasps & seals
  - Measures tissue impedance
  - Minimal lateral thermal tissue injury

Technical Challenges in VH
- Large Uterus
  - Morcellation ONLY after ligating uterine arteries
  - Bivalve cervix/Wedge excision
  - Long curved morcellating knife (Precise Surgical, CA)
  - Keep track of uterine serosa
    - ‘dunk’ technique
    - Avoid digging into a hole

Use of Surgical Innovations to Facilitate the Difficult Vaginal Hysterectomy
Conversion: NOT a COMPLICATION

- When:
  - Heavy uncontrolled bleeding
  - During morcellation
  - Avulsed vascular pedicle that you cannot control
  - Loops of bowel into the vagina

Summary

- VH
  - a minimally invasive procedure
  - The preferred approach
  - Develop new “criteria” for vaginal approach
  - Utilize new technology & instrumentation

Make THE difference !!

<table>
<thead>
<tr>
<th>Year</th>
<th>Open %</th>
<th>Vaginal %</th>
<th>Lscp %</th>
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<td>1990'</td>
<td>75.7</td>
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What To Do When ‘Good’ Surgery Goes ‘Bad’:
Avoidance, Recognition, and Management of Pelvic Floor Surgery Complications

Marie Fidela R. Paraiso, M.D.
Professor of Surgery, Cleveland Clinic Lerner College of Medicine at Case Western Reserve University
Head, Center of Urogynecology and Reconstructive Pelvic Surgery
Cleveland, OH
USA

Objectives
- To summarize various complications of pelvic floor surgery based on
  - Pelvic Compartment
  - Organ function
  - Specific Procedures
- To discuss strategy for avoidance, prevention, and management of these complications
- To review pertinent literature with regard to complications
- To present some trying but gratifying cases

Anterior Compartment
- Bladder dissection
  - Avoiding cystotomy
    - Retrograde bladder fill
    - Sharp dissection
    - Avoid blunt dissection with sponges by vaginal or open route
    - Continuous bladder drainage? Do not crede if you cannot get a catheter to drain
  - Preventing fistula
    - Close muscularis defects during difficult bladder dissection
    - 2 layer closure for cystotomy
    - Interpose omentum or biologic between mesh and repair
  - Avoiding suture erosion
    - Use delayed absorbable suture at bladder base during sacral colpocopy
    - Do not strangulate the tissue by placing too much tension
  - Cystoscopy, cystoscopy, cystoscopy

Bladder Injury During Transvaginal Mesh Placement
- Cystotomy can occur during dissection or needle/trocar placement
- Precise hydro-dissection is key to prevention
- Keep high index of suspicion at all times
- Standard principals of tension free layered repair (avoid over suturing)
- Get help if unsure of “best” management
- Prolonged indwelling catheter a must
- Patient educated to monitor foley and avoid distension

Hydrodissection Technique

Disclosures
- I have no financial relationships to disclose.
Cystotomy and Repair During Anterior Mesh Kit Placement

Biologic Graft attached to Polypropylene Graft

Biologic Graft covering Cystotomy Repair

Anterior Compartment

- Bladder perforation
  - 3-9% of midurethral slings (MUS)
  - Consider transobturator sling in patients with previous RPS
  - Diagnose with cystoscopy, and treat with 1-2 days of indwelling catheter depending on severity
  - Prevent by passing device in close contact with the back of the pubic bone during retropubic MUS

- Theoretically there should not be a risk of perforation with transobturator slings, but... some special people have seen this.

- Urethral perforation
- Bowel perforation
Hydrodissection of the retropubic space is key!!!

Inferior Epigastric Vessels
Obturator vessels
Ext. Iliac Vessels
Bladder

Do not forget Trendelenberg!

Bladder Perforation
Cysto
Cysto
Cysto
Cysto!
Unidentified Tape Placement into the Bladder

If you see a pucker, remove the pucker...

Suprapubic-assisted Operative Cystoscopy for Intravesical Sling Erosion

- Operative cystoscopy with 30 degree lens
- Suprapubic placement of 3-5 mm laparoscopic trocar
- Traction with grasper
- Submucosal transection of mesh at each site
- Foley x 10 days followed by retrograde cystogram

Bladder Injury During Transobturator Sling

- Case series of 3 patients (Mentor O→I)
- Incidence 3/61 patients (5%)
- Obesity and prior surgery implicated as contributing factors
- Repair cystocele prior to sling placement*
- Routine cystoscopy recommended during all slings

Minaglia et al. Urology 64, 376 e1 – 376 e2, 2004
D’Argent 2004*

Out-to-In Obturator Sling

19
Complication: Urethral Erosion

PREVENTION:
- Avoid excessive sub-urethral dissection
- Avoid placement of tape under tension
- Use catheter guide and Foley

INTERVENTION:
- Consider local excision of mesh, layered closure of urethra and an indwelling urethral catheter for several days

Urinary Retention & Voiding Dysfunction
- Incidence following slings and urethropexies ranging from 1.3 - 25%
- Use cough-stress test to set “tension” and allow a few drops of leakage
- Use a “spacer” between tape and urethra while pulling off sleeves or adjusting tension
- Can loosen if diagnosed within first post-operative week
- “Takedown” by transecting tape in midline or at lateral fornices if patient further out from surgery
- Consider adjustable sling

Vessel Injury
- Major vessel injury in 14 of 500,000 cases (<1/1000) of TVT
- Prevent by staying medial with placement
- Open repair if hemodynamically unstable; otherwise, interventional radiology
- Vessels at risk
  - Obturator (Retropubic & Trans-obturator slings)
  - External Iliac (Retropubic slings)
  - Femoral (Prepubic slings)
TVT Complications in 1455 Patients in 38 Hospitals in Finland in 1999

- Bladder perforation: 3.8%
- Minor voiding difficulties: 7.6%
- Retention: 2.3%
- Retropubic hematoma: 1.9%
- Major vessel injury: 0.07%
- Need for post-op laparotomy for a complication: 0.3%

Kuuva and Nilsson, 2002

Complications: USVVS

- Ureteral obstruction rate:
  - 1 - 11% intraoperatively
  - ~90% of these resolved intraoperatively
  - 0.9% ureteral injury rate requiring further intervention


Apical Compartment

- Ureteral obstruction during USVVS
- What to avoid during SSF

SSF: Complications

- Complications:
  - Buttock pain
  - Nerve injury
  - Rectal injury
  - Vaginal stenosis
  - Stress incontinence
  - Hemorrhage
  - Ureteral obstruction
  - Flowseal and pack
  - Consider IR

Morley G, DeLancey JOL, AJOG 1988; 158:872-81
The Posterior Compartment

- Rectocele Repair with or without Mesh
  - Vaginal Constriction
  - Dyspareunia
  - Apareunia

Management of Iatrogenic Vaginal Constriction

- Incision of vaginal ring or ridge
- Vaginal advancement
- Z-plasty
- Graft placement
  - Subjective and objective cure rates were 75% and 85%, respectively
  - The surgical procedure depends on the site and extent of the vaginal constriction, integrity of surrounding tissue, and overall vaginal length and caliber
  
Vassalo and Karram Obstet Gynecol 2003;101:512-20

- Labial cutaneous flap procedure
- Perineotomy with perpendicular closure
- Episiotomy with sliding skin margins
Now: the rest of the story....

Botulinum Toxin
A. 100 units in injectible saline diluted to 4-5 ml

Pelvic nerve injury following gynecologic surgery: a prospective cohort study

OBJECTIVE: To determine the incidence and time course of postoperative neuropathy resulting from gynecologic surgery.

STUDY DESIGN: A single cohort of 616 female patients undergoing elective gynecologic surgery for benign or malignant conditions underwent a postoperative neurologic evaluation to identify postoperative neuropathy of the lower extremities.

RESULTS: Fourteen peripheral nerve injuries were observed in 11 patients, making the overall incidence of postoperative neuropathy 1.8% (95% confidence interval, 1.0–3.2). Injury to the lateral femoral cutaneous (5), femoral (5), common fibular (1), ilioinguinal/iliohypogastric (1), saphenous (1), and genitofemoral (1) nerves were detected. Complete resolution of neuropathic symptoms occurred in all but 1 patient (91%). Median time to resolution of symptoms was 31.5 days (range, 1 day to 6 months).

CONCLUSION: The incidence of lower extremity neuropathy attributable to gynecologic operations is low, and these neuropathies resolve in the great majority of cases.


Medicolegal Considerations

- Educate patient/thorough informed consent
- “The complication is not the sin, the failure to recognize it is.” –Anonymous
- Intra-operative recognition is key
  - Cystoscopy with IV indigo carmine
  - Rigid proctoscopy/digital exam
  - Leave the OR happy with no second thoughts
- Know when to get help!
- Be honest with patient and family
- Document, Document, Document
Support of the Apex during Hysterectomy

Kevin J. E. Stepp, MD
Director, Advanced Surgical Specialties for Women
Chief, Urogynecology and Minimally Invasive Surgery

Objectives

– Be able to discuss the different options available to treat uterine prolapse at the time of vaginal hysterectomy
– Illustrate the steps involved in a uterosacral ligament vaginal vault suspension
– Identify anatomic structures associated with vaginal vault suspension procedures

Is all prolapse treated equally?

Surgical Treatment of Prolapse

– Vaginal approach
  - Traditional repairs
– Abdominal approach
– Laparoscopic approach
– Prolapse Mesh “Kits”

Disclosures

• Consultant: Covidien, Stryker Endoscopy
• Stock Shareholder: Titan Medical
• Speaker's Bureau: Covidien, Stryker Endoscopy
Vaginal Vault Suspensions

- High McCall culdeplasty
- Sacrospinous ligament suspension
- Uterosacral ligament suspension
- Ileococcygeus fascia suspension
- Colpectomy (partial or complete)
What is the best treatment?

To some extent, that depends on where you practice.
Traditional debate has been vaginal vs. abdominal approach.
Anterior Support Defects

- Treating the apical/vault prolapse may be most important for treating proximal anterior support defects.
- Distal anterior support defects are the most difficult to treat.
Structural and Functional Support of the Female Pelvis

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Chief, Urogynecology and Minimally Invasive Surgery
Carolinas Healthcare System
Charlotte, North Carolina

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www.drkevinstepp.com

Objectives

- Be able to review the bones and muscles of the pelvis.
- Describe how they interact to maintain pelvic organ support.
- Discuss endopelvic fascia network and supportive structures.

Disclosures

- Consultant: Covidien, Stryker Endoscopy
- Stock Shareholder: Titan Medical
- Speaker's Bureau: Covidien, Stryker Endoscopy
Musculature Review

- Pelvic Floor (Diaphragm)
  - Levator Ani
  - Puborectalis
  - Pubococcygeus
  - Iliococcygeus
  - Coccygeus
  - Perineum
- Pelvic Sidewalls
  - Obturator internus
  - Piriformis

Role of Levator Ani

- Main mechanism of support
- Maintains constant tone
- Rapid contraction with cough, etc.
- Relaxation with defecation/urination

Compressor Urethrae (CU) and Urethrovaginal Sphincter (UVS)

Role of the endopelvic fascia and supportive ligaments

- Normal axis of vagina
  - Upper 2/3 – Nearly horizontal
  - Distal 1/3 – Nearly vertical
  - Endopelvic fascia is responsible for maintaining position of pelvic organs over the levator plate so that they may be supported.

Endopelvic Fascia

- Collagen, elastin, adipose tissue, nerves, vessels, lymph channels, and smooth muscle
- Provide stabilization and support yet allow for the mobility
Failure of Level 1 support

Endopelvic Fascia

• Arcus Tendineous Fascia Pelvis

Endopelvic Fascia

• Arcus Tendineous Rectovaginalis

Endopelvic Fascia

• Arcus Tendineous Fascia Pelvis

Failure of Level 2 support
Interaction of Muscle and Endopelvic Fascia

- Muscles: “long term support”
  - Tonic, active closure of genital hiatus
  - Support of levator “plate”
- Connective tissues/ligaments: “short term support”
  - Passive support during opening of hiatus
  - Maintain position of pelvic organs

Failure of Level 3 support

Carolinas Medical Center
Advanced Surgical Specialties for Women
Vaginal Adnexectomy

Rosanne M. Kho, MD
Associate Professor
MIGS Fellowship Program Director
Dept of Gyn Surgery
Mayo Clinic in AZ

Objective
- Describe challenges and limitations to the traditional approach to vaginal adnexectomy
- Demonstrate the round ligament technique
- video

Technical Challenges to VH
- Salpingo-oophorectomy in hysterectomy
  - Abdominal: 60%
  - Vaginal: 10%

Survivor's choice
- Factors that may affect choice of route of hysterectomy
  - Level of comfort/training
  - Lack of assistance
  - Poor exposure w/ vaginal approach

Financial Disclosure
- Other: Honorarium - Ethicon Endo-Surgery

Jacoby et al OBGyn 2009;116:1041

Wilcox et al OBGyn 1994;83:549
Vaginal BSO

- N = 1026 VH + BSO
- No increased complications with BSO
- Mean additional time for BSO = 11.4 min


<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>75</td>
</tr>
<tr>
<td>1996</td>
<td>84</td>
</tr>
<tr>
<td>1999</td>
<td>98</td>
</tr>
</tbody>
</table>

Vaginal BSO

- N = 1725 patients
- Post-op bleeding (ovarian vessels) = 0.1%


Traditional: Mesosalpinx-mesoovarium (one pedicle) technique

Limitations:
- Thick pedicle
- Retraction of ovarian vessels
- Incomplete removal
- Up against the pelvic side wall: risk to ureters

Round Ligament technique

Technical Challenges to VH

- High adnexae:
  - Mobilize & skeletonize the IP lig – Round ligament technique
  - Endo-loop
  - Extra long deaver
Conclusions

- Vaginal adnexectomy
- Feasible. Safe
- Round ligament technique
- High adnexae
- Complete removal of tubes and ovary
- Facilitating devices
Intraoperative Cystoscopy: Role, Technique, Normal and Abnormal Findings

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Professor of Surgery
Head, Section of Urogynecology and Reconstructive Pelvic Surgery
The OBGYN and Women's Health Institute
Cleveland, OH
USA

Diagnostic Cystoscopy
- Hematuria
- Fistula
- Previous Surgery
- Irritative Voiding Symptoms
- Obstructive Voiding Symptoms
- Recurrent UTIs
- Diverticulum
- Bladder Pain
- Rule out LUT Injury intraop

Intraop Cystoscopy
- Evaluate bladder/ureters for injury
- Indicated when moderate to high risk of LUT injury
- Cost-saving when risk >1.5%
  - Visco et al, AJOG 2000
  - Almost all incontinence and prolapse surgeries, and many laparoscopic procedures

Bladder Injury
- TVH 0.3%
- TAH 0.5%
- LAVH 1-4%
- Urogyn 2-4%
- TVT 4-6%
- TOT <0.5%

Predisposing GYN Factors to Bladder and Ureteral Injury
- Endometriosis, ovarian tumors, pelvic inflammatory disease, or tubo-ovarian abscess
- Uterine leiomyomata, especially if very large, located in the lower uterine segment, or compressed against the pelvic sidewall
- Prior pelvic or bowel surgery; adhesions
- Urogynecologic procedures or cancer surgery

Disclosure
- I have no financial relationships to disclose.
Lower Urinary Tract Complications of Gynecologic Surgery

- Bladder, urethral, or ureteral injury
- Mesh or suture in bladder, urethra, or vagina
- Fistula
- Persistent Incontinence and voiding dysfunction

Injury Prevention and Recognition

- Maintain good surgical visualization and hemostasis
- Avoid blind clamping, grasping, or suturing
- Routinely open the lateral retroperitoneal spaces to visualize ureters and vessels, lateral incisions/ureterolysis
- Identify ureters while performing pelvic surgery and keep them in view

Cystoscopy should be done freely (routinely?) -- whenever there is even a slight concern about bladder or ureteral injury

Ureterolysis is a great skill. This is a skill differentiates advanced laparoscopists from everyone else.

If not comfortable or have privileges with cystoscopy, perform Teloscopy

Insert catheter into the ureter intraoperatively through cystotomy, if necessary

Incidence of Ureteral Obstruction and Injury During Vaginal Surgery for Pelvic Organ Prolapse

<table>
<thead>
<tr>
<th>Procedure</th>
<th>N</th>
<th>N Ureteral Obstruction % (95% CI)</th>
<th>N</th>
<th>Ureteral Injury % (95% CI)</th>
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</thead>
<tbody>
<tr>
<td>Uterosacral ligament vaginal vault suspension</td>
<td>355</td>
<td>21</td>
<td>5.9 (3.9 - 8.9)</td>
<td>3</td>
</tr>
<tr>
<td>Proximal McCall culdeplasty</td>
<td>204</td>
<td>9</td>
<td>4.4 (4.4 - 8.2)</td>
<td>3</td>
</tr>
<tr>
<td>Colpocolpitis</td>
<td>48</td>
<td>2</td>
<td>4.2 (1.2-1.4)</td>
<td>0</td>
</tr>
<tr>
<td>Distal McCall culdeplasty</td>
<td>185</td>
<td>1</td>
<td>0.5 (0.1-1.3)</td>
<td>0</td>
</tr>
<tr>
<td>Anterior Colporrhaphy</td>
<td>574</td>
<td>2</td>
<td>0.4 (0.1-1.3)</td>
<td>0</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>700</td>
<td>36</td>
<td>5.1 (3.7-7.1)</td>
<td>6</td>
</tr>
</tbody>
</table>

Overall

- Ureteral Obstruction: 36 (3.7-7.1)%
- Ureteral Injury: 6 (0.4-1.9)%
Intraoperative Cystoscopy N=700

- No Spill from One or Both Ureters (Positive Cystoscopy) N = 37 (5.3%)
- Bilateral Ureteral Spill (Negative Cystoscopy) N=663 (94.7%)

Preexisting GU Pathology (False Positive) N=3 (0.4%)
Intraoperative Ureteral Obstruction N=34 (4.9%)
Postoperative Ureteral Obstruction (False Negative) N=2 (0.3%)
No Ureteral Obstruction N=661 (94.4%)

Procedure Related Ureteral Obstruction N=36 (5.1%)

Postoperative Ureteral Obstruction

Procedure Related Ureteral Obstruction N=36 (5.1%)
Intraoperative Cystoscopy N=700

No Spill from One or Both Ureters (Positive Cystoscopy) N=37 (5.3%)

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No Ureteral Obstruction N=661 (94.4%)

Procedure Related Ureteral Obstruction N=36 (5.1%)

No Spill from One or Both Ureters No Spill from One or Both Ureters N=37

Stent Attempted Stent Attempted N=11

Preexisting GU Pathology, N=3

Unsuccessful (N=11) Suture Removed N=24

Evaluated Postop N=2

Suture Removed N=35

Obstruction Relieved N=30

Percutaneous Nephrostomy N=2

Reoperation for Suture Removal N=1

Ureter Repair N=1

Questions?

No flow: what next?

- Step 1. – wait 10 minutes
- Step 1.5 – check chart for h/o urologic surg. (i.e., nephrectomy)
- Step 2. – Consider lasix
- Step 3. – Consider stent/flouroscopy
- Step 4 – remove apical suspension sutures sequentially
  - most distal first
- Step 5 – remove upper anterior repair sutures
- Step 6 – Reconsider stent/flouroscopy
- Step 7 – laparotomy/reimplant vs. awaken patient and perform postoperative IVP
Evidence-Based Management for Same Day Discharge after Hysterectomy

Barbara S. Levy MD, FACOG, FACS
Vice President, Health Policy
American College of Obstetricians & Gynecologists
AAGL 2012

Disclosure
Consultant: Conceptus Incorporated, Gynesonics, Halt Medical

Learning Objectives
• Describe the pre-operative preparation to achieve safe same day discharge after hysterectomy
• Discuss the medication management to optimize patient experience and reduce post-operative stay
• Review post-operative procedures and techniques to facilitate safe and cost-efficient outpatient management of patients with major surgery

“It’s not what you don’t know that hurts you – it’s what you know for sure that just ain’t so.”
– Mark Twain

Facts.......??
There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact.

Mark Twain – Life on the Mississippi

Keep things as simple as possible....but not simpler
Albert Einstein

Evidence Based Guidelines for Optimal Management
OUTPATIENT SURGERY PROTOCOL

Before Surgery: Create A Partnership in Healing...
- Establish a relationship with patient
- Full disclosure re:
  - Complications
  - Alternatives
- Buy in from nursing team

Create A Partnership in Healing...
Consider psychosocial issues
- Fears re: surgery
- Financial issues/concerns
- Childcare arrangements
- Hx abuse / victimization

Create A Partnership in Healing...
- Provide written materials
- Establish expectations for recovery
  - Discharge planning
  - ADL - ? When to drive, shop ...
  - Review warning signs post-op
  - Provide prescriptions pre-op

Anticipatory Management
- Careful history – risk factors
- Prior experience with surgery
  - Nausea
  - Medications
  - Urinary retention

PREOPERATIVE MANAGEMENT
- Extensive counseling
  - Expectations for procedure and recovery
- Prescriptions for:
  o Bowel Care
  o Sleep
  o Balanced Analgesia
    ▪ Round-the-clock NSAIDs
    ▪ Opioids as needed
**Anticipatory Management**

Pre-empt nausea with:
- Scopolamine
- Ondansetron
- IV Decadron
- Metaclopromide
- Hydroxyzine with narcotics

Pre-empt pain with:
- NSAIDS
- Narcotics
- Pre-injury local anesthesia
- Gabapentin 1200mg hs prior
- Older patients/GERD - famotidine

Anesth Analg 2004;98:1370-3

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**Preoperative Management**

- Nausea prophylaxis - Preoperative
  - Scopolamine transdermal patch
  - Ondansetron – orally
  - IV steroids in highly susceptible patients (6-12mg Decadron with onset of anesthetic)

(NEJM 2004;350:2441)

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**Day of Surgery: Create a Patient-Centered Environment**

- Reaffirm your relationship
- Be present during anesthesia induction
- Establish eye contact & touch patient
- Soothing/healing music
- Guided imagery

---

**Optimizing Surgical Outcomes**

- Careful patient positioning
- DVT prophylaxis
- 1 dose 1st generation cephalosporin
- Meticulous hemostasis
- Careful tissue handling
- Early ambulation
- Avoid indwelling catheter

---

**Intraoperative Management**

- Gentle tissue handling
- Avoid retractors when possible
- Avoid packing bowel (move table)
- Use irrigation/suction to clear the field
- Minimize tissue damage
Intraoperative Management

- Understand energy sources well
- Know your equipment – what is available if something fails
- Read package inserts & instructions

Energy-Based Vessel Ligation Comparison
Carotid Arteries Longitudinal Sections

Animal Model

The artery has been fused and the lumen obliterated with one 5 second application of the LigaSure™ System.
The artery has been coagulated with one application of a standard bipolar forceps. The lumen is open and a proximal thrombus is present.

Optimizing Surgical Outcomes

- Meticulous intraoperative surveillance and technique .......If you think things are "probably OK" ..... LOOK AGAIN – THEY’RE NOT!

Post-operative Management

Be pro-active:
- Early ambulation
- Eliminate indwelling catheter
- Eliminate bowel prep
- Early feeding
- Anticipate problems – bowel care, nausea, pain management

Post-operative Rx

- Nausea prophylaxis – postoperative
  Metaclopramide to increase motility
  Adequate hydration to prevent orthostatic hypotension with ambulation
  Hydroxyzine with narcotics
  Ondansetron as needed

Post-operative Management

- Contact patients daily until they are well
- Reminders re: bowel care, ambulation
- LISTEN to your patient – if she calls with a complaint – see her – it is easier than worrying and much easier than facing her lawyer.
How Do We Define Outcome?

- Complications
- Length of stay
- Patient satisfaction
- Long-term results
- Cost

STUDY DESIGN

Prospective database of hysterectomies performed:
- January 2000 to December 2010
- Single surgeon
- Community hospital (110 beds)

Vaginal Hysterectomy

N = 1039 Single surgeon

196 Nulliparous
190 Previous C/S or myomectomy
289 > 250 grams

LENGTH OF STAY

<table>
<thead>
<tr>
<th>LOS (days)</th>
<th>n (%)</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1003  (96.5)</td>
<td>N/A</td>
</tr>
<tr>
<td>1</td>
<td>34    (3.3)</td>
<td>Pain, nausea or lack of caregiver at home</td>
</tr>
<tr>
<td>2</td>
<td>1     (0.001)</td>
<td>Tachyarrhythmia</td>
</tr>
<tr>
<td>9</td>
<td>1     (0.001)</td>
<td>Concomitant disease</td>
</tr>
</tbody>
</table>

PATIENT DEMOGRAPHICS

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>Outpatient n = 1003</th>
<th>Inpatient n = 36</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>46 ± 8 (26-86)</td>
<td>55 ± 16 (32-70)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Uterine weight (g)</td>
<td>241 ± 218 (28-1575)</td>
<td>231 ± 1277 (46-1300)</td>
<td>NS</td>
</tr>
<tr>
<td>Operating time (min)</td>
<td>41 ± 20 (17-142)</td>
<td>45 ± 30 (21-160)</td>
<td>NS</td>
</tr>
<tr>
<td>EBL(cc)</td>
<td>58 ± 65 (25-500)</td>
<td>66 ± 72 (20-200)</td>
<td>NS</td>
</tr>
</tbody>
</table>

RESULTS

- 1039 Vaginal hysterectomies
- 1003 (96%) outpatient
- No readmissions within 7 days
- 5 patients readmitted at 10-20 days
**Direct Costs 2002-2003**

**FHS – Vaginal Hyst**

<table>
<thead>
<tr>
<th></th>
<th>Inpatient N=211</th>
<th>Outpatient N=207</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Costs</td>
<td>$536,316</td>
<td>$403,304</td>
</tr>
<tr>
<td>Mean cost/case</td>
<td>$2542</td>
<td>$1939</td>
</tr>
</tbody>
</table>

**Cost Reduction**

Outpatient Vaginal Hysterectomy reduced direct costs by 24% over standard inpatient protocols

IF 90% of hysterectomies were performed vaginally using the outpatient protocol potential savings are significant

JMIG 2005;12:494-501

**Impossible Things**

- Over 90% of hysterectomies may be accomplished by the vaginal approach
- Over 90% of vaginal hysterectomy patients may be safely discharged home within hours of surgery
- Patient safety and satisfaction is optimal with outpatient stays

**CONCLUSIONS**

- Same day discharge is feasible and safe in the majority of patients
- Older patients may require an overnight stay
- Anticipatory management permitted early oral intake and ambulation
- Anticipatory management eliminated readmission for pain control or nausea

**References**

- Anesth Analg 2004;98:1370-3
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

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.

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 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.

If you add staff to assist with LEP patients, confirm their translation skills, not just their language skills. A 2007 Northern California study from Sutter Health confirmed that being bilingual does not guarantee competence as a medical interpreter. http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2078538.