Objectives

- Review data regarding endometrial ablation and supracervical hysterectomy compared with alternative treatments, including total hysterectomy
- Review putative risks of ablation and retained cervix
- Demonstrate each surgical step in resection of cervix after a supracervical hysterectomy was done
Disclosures

- Consultant
  - Applied Medical
  - Olympus

- I am not a GYN oncologist
- I am a benign gynecologic surgeon who eagerly looks for oncoreductive opportunities for my patients
Endometrial ablation

- 32yo g0 with premature ovarian failure
- Treated with OCs → Endometrial ablation
  “Discussed that we do not need to check estrogen levels but rather can treat her symptoms. We may want to decrease dose in future; however, at this time given her age it is reasonable to use increased dose. Also, we discussed estrogen only is acceptable since she has had endometrial ablation. If she develops spotting or bleeding in future, she will need to let us know since there may be small areas of endometrium which were not burned during procedure which can place her at small risk for hyperplasia.”

Endometrial ablation

- Referral:
  - 50yo 16-18 wk fibroid uterus
  - Endometrial ablation two years prior, improved bleeding, but remains “extremely symptomatic” with pelvic pain and dysmenorrhea
  - Pre-ablation bx negative; “I have not been able to biopsy her since the ablation as I might expect.”
  - Tubal ligation 10 years ago
  - Medhx: diabetes, hyperlipidemia, 3-agent HTN with kidney disease
  - BMI 36 kg/m²
  - “I am going to refer this patient to Dr. Siedhoff for possible laparoscopic hysterectomy”
Endometrial ablation

• History
  - **Resectoscopic** endometrial ablation (REA)
    - Laser, rollerball, loop electrode
  - **Non-resectoscopic** endometrial ablation (NREA)
    - AKA global or 2nd gen endometrial ablation devices
    - Bipolar radiofrequency (Novasure®)
    - Hot liquid filled balloon (TheraChoice®)
    - Cryotherapy (Her Option®)
    - Circulating hot water (Hydro ThermAblator®)
    - Microwave (Microwave Endometrial Ablation)

Postoperative complications:
  - Pregnancy after endometrial ablation
  - Pain related obstructed menses
  - Hematometra, post-ablation tubal sterilization syndrome (PATSS)
  - Treatment failure
  - Repeat ablation, hysterectomy
  - Risk from pre-existing conditions
  - Endometrial hyper- / neoplasia, cesarean delivery
  - Infection
Endometrial ablation

• Pregnancy related complications
  – Ablation is not contraception
  – 134 cases reported
  – Risks:
    • Ectopic pregnancy (6.5% of post-ablation pregnancies)
    • Spontaneous abortion (28%*)
    • Preterm birth (31%), pPROM (16%)
    • Abnormal placentation (25%)
    – 60% underwent peripartum hysterectomy
    • Cesarean delivery (44%)
    • Intrauterine scarring / chambering
    • Postpartum hemorrhage

Endometrial ablation

• Pain-related complications
  – Amenorrhea 13-55%; 95% of pts have functional endometrium on MRI, even if amenorrheic
  – Post-ablation tubal sterilization syndrome (PATSS)
    • Difficult to target cornua with ablation
    • Visceral distension from menses obstruction
    • Treatment: salpingectomy < hysterectomy
    • Hysteroscopic sterilization
      – Ablation scarring prevents adequate post-sterilization HSG, so recommendation is to wait until after 3 mo period before ablation
Endometrial Ablation

Original Article

Predicting Pelvic Pain After Endometrial Ablation: Which Preoperative Patient Characteristics Are Associated?

May S. Thomassee, MD*, Howard Curlin, MD, Amanda Yunker, DO, MSCR, and Ted L. Anderson, MD, PhD

From the Division of Minimally Invasive Gynecologic Surgery, Vanderbilt University Medical Center, Nashville, Tennessee (all authors).

• 437 women followed median 2 years after ablation
• 21% developed pelvic pain
• 46% went on to have hysterectomy
• 15% of total cohort: hysterectomy
  – 1/3 pain, 1/3 bleeding, 1/3 both

• Risk factors for post-ablation pain
  – Dysmenorrhea
  – Age < 40
  – Tubal ligation
  – Smokers

Results:

Of 437 women who underwent endometrial ablation, 20.8% reported pain after their ablation. Patients were followed that are associated with pelvic pain after endometrial ablation.

Conclusion:

The incidence of pain after endometrial ablation were evaluated using the chi square, Fisher exact, and independent tests where

P

The relationship between developing pain and several

Adenomyosis (suggested on ultrasound) and body mass index associations

Bivariate analysis of patient demographics and the in-

BMI (kg/m2) 36.0
Age (y) 42.6
Parity 2.3
Cesarean delivery 9 (30.0) 88 (32.6) .84

Risk factors for post-ablation pain

Tubal ligation

Demographic

Findings on imaging

Uterine size (cm) 7.1
Endometriosis2 (6.7) 7 (2.6) .22
BMI (kg/m2) 31.7
Age (y) 46.9
Parity 2.3
Cesarean delivery 9 (30.0) 88 (32.6) .84

Risk factors for post-ablation pain

Tubal ligation

• 270 women after various NREAs
• 23% developed new or worsening pelvic pain
• 73% of those with new or worsening pain had preop fibroids or adenomyosis
• 19% of total cohort: hysterectomy
  – 30% pain, 26% bleeding, 20% both
  – 3 hyperplasia, 1 STUMP, 1 CA
  – 2 hyperplasias missed on EMBx, one not done

Risk factors for post-ablation pain

Dysmenorrhea

Tubal ligation

Non-white race (?leiomyomas)
Characteristics of Patients Undergoing Hysterectomy for Failed Endometrial Ablation

- Compared 51 hysterectomy patients to 178 satisfied controls
  - Age (39 vs 44, p<0.01)
  - BTL (69% vs 44%, p=0.06)

Presenting sxs for hysterectomy

Pathology from hysterectomy
Endometrial ablation

Rates of treatment failure
- 14,078 women
- 20% subsequent hysterectomy
- 1169 women
- 13% subsequent hysterectomy

Endometrial ablation

- Patients at risk for hyperplasia / neoplasia
  - Nulliparity, chronic anovulation, obesity, diabetes
- Hysterectomy Subsequent to Endometrial Ablation

Outcomes following hysterectomy or endometrial ablation for heavy menstrual bleeding: retrospective analysis of hospital episode statistics in Scotland

UNC: 16 patients s/p ablation undergoing hysterectomy
- EMB insufficient 50% of the time
- D&C insufficient 73% of the time
- EMB agreed with hysterectomy only 27% of the time
- D&C agreed with hysterectomy only 20% of the time
Endometrial ablation

- Post-caesarean delivery
  - GU injuries (bladder and ureteral fistulae) reported
  - Quantitative risk unknown
- Infection
  - Endometritis (1.4–2.0%)
  - Myometritis (0–0.9%)
  - PID (1.1%)
  - TOA (0–1.1%)
- Endometrial destruction / necrosis thought to be a risk factor different than simple hysteroscopy

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Endometrial ablation

- Comparisons among treatments
  - Hysterectomy
  - LNG-IUS
  - Endometrial ablation
  - Hysterectomy associated with highest satisfaction and most cost-effective
    - (despite low numbers of TLH)

**Hysterectomy, endometrial ablation and Mirena® for heavy menstrual bleeding: a systematic review of clinical effectiveness and cost-effectiveness analysis**

Health Technology Assessment 2011; Vol. 15: No. 19
ISSN 1366-5278
Endometrial ablation

Review Article

A Systematic Review Comparing Hysterectomy with Less-Invasive Treatments for Abnormal Uterine Bleeding

- 9 RCTs reviewed
  - Some studies: better SF-36 for pain, vitality, general health, social function w/ hysterectomy
  - Most studies: no statistical difference in satisfaction (one favored hysterectomy)
  - One study: 73% (hyst) vs 48% (ablation) “health much better” compared w/ 1 year ago
  - Hysterectomy superior for dysmenorrhea
  - Pelvic pain: 18-64% ablation vs. 5-19% hysterectomy
  - 2-19% of ablation patients underwent repeat ablation; 10-29% underwent hysterectomy
  - Similar results comparing hysterectomy to LNG-IUS
  - Very small numbers of laparoscopic hysterectomy

Endometrial ablation

Hysteroscopic Endometrial Resection Versus Laparoscopic Supracervical Hysterectomy for Abnormal Uterine Bleeding: Long-term Follow-up of a Randomized Trial
Ezirico Zapi, MD*, Gabriele Centini, MD, Lucia Lazzeri, MD, PhD, Andrea Finco, MD, Catarina Exacoustos, MD, PhD, Karedina Afors, MD, Palvio Zullo, MD, and Felice Petrujlia, MD

- RCT of LSH vs Hysteroscopic endometrial ablation for Abn Uterine Bleeding
  - Initial trial: 1995-1997, 203 randomized patients
  - AUB for > 6 mos, refractory to medical treatment
  - Uterus size < 12 weeks, age < 50yo, normal cervical cytology
    - Two-year outcomes favored LSH
    - No difference in hospitalization, complications, resumption of activities
    - Higher reoperation rate with HEA (13% vs 1%), greater satisfaction LSH
    - Contacted patients 15 years later
    - Results
      - 153 subjects
      - Reoperation rate: 28% vs 0%
      - All HEA patients received repeat ablation, 75% of those went on to have hysterectomy
      - Hysterectomy: higher mental and physical scores on SF-12
Levonorgestrel-Releasing Intrauterine System and Endometrial Ablation in Heavy Menstrual Bleeding

A Systematic Review and Meta-Analysis

Andrew M. Kaunitz, MD, Susanna Meredith, MD, Pirjo Inki, MD, NS, Ali Kubba, MD, and Luis Sanchez-Barrco, MD

• 6 RCTs
• No difference in HMB or quality of life improvements
• Ablation assoc w higher risk of perioperative and long-term complications

![Diagram showing comparisons between treatments and study results](image)

- Hysterectomy more common w ablation
  –(24% vs 4%, p=0.04)
- Hgb higher in LNG-IUS grp
  –(14.1 vs 12.7, p=0.01)
- Bleeding profile favors LNG-IUS
- Patient ratings higher LNG-IUS
  –Acceptability
  –Perceived clinical improvement
  –Overall satisfaction
Hysterectomy v Ablation

• 8 RCTs; 1260 subjects
  –Two trials only AH, one VH, two LH, three 2 or all
• Hysterectomy outperformed ablation
  –Bleeding symptoms, satisfaction, need for repeat surgery
• Hysterectomy associated with small increases in postop complications: Sepsis, tx, fever, vault hematoma, wound hematoma, infection

Endometrial ablation

• Specific conditions
  –Fibroids
    • Consider removing the fibroids—HSC or LSC myomectomy
  –Obesity
    • Obesity does increase risk in surgery, but major risk factor for EMCA
  –Developmental delay
    • Age most consistent significant risk factor for ablation failure
    • Ablation is not contraception & pregnancy post-ablation assoc w/ risk
    • Ablation can be difficult in small nulligravid uteri
  –Pelvic Pain
    • Risk factor for treatment failure
    • Post-ablation post-tubal ligation syndrome
<table>
<thead>
<tr>
<th></th>
<th>Endometrial Ablation</th>
<th>LNG-IUS</th>
<th>Hysterectomy</th>
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</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>No protection</td>
<td>Temporary protection</td>
<td>Permanent protection</td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>Variable</td>
<td>Improves</td>
<td>Definitive treatment</td>
</tr>
<tr>
<td>Contraception</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Future pregnancy</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>In-office</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Cost</td>
<td>Middle</td>
<td>Least expensive</td>
<td>Most expensive</td>
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<tr>
<td>Reimbursement</td>
<td>Best</td>
<td>Least</td>
<td>Middle</td>
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<tr>
<td>Procedure risk</td>
<td>Middle</td>
<td>Least</td>
<td>Most</td>
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<tr>
<td>Endometrial sampling</td>
<td>Problematic</td>
<td>Yes</td>
<td>Not needed</td>
</tr>
<tr>
<td>Return to activities</td>
<td>Middle</td>
<td>Fastest</td>
<td>Slowest</td>
</tr>
<tr>
<td>Hormonal side effects</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Other procedural interventions

- Uterine artery (fibroid) embolization (UAE/UFE)
- MR-guided focused ultrasound surgery (MRgFUS)
- Radio-frequency ablation (RFA) / “HALT” procedure, Acessa™ (Halt Medical, Brentwood CA)
Uterine artery embolization

- Interventional radiology procedure
  - Catheter is threaded through femoral artery to anterior division of the internal iliac artery to the uterine artery
  - Embolization material is then delivered to slow or cut off blood supply to fibroid → tumor necrosis, calcification, shrinkage (30-60% volume reduction)

- Good candidates
  - Women who wish to avoid surgery or are poor surgical candidates
  - Symptoms are more bleeding than bulk

- Poor candidates
  - Very large (>10cm) fibroids
  - Pedunculated, submucosal fibroids
  - GnRHα treatment (reduces vessel caliber)

- Advantages
  - Local anesthesia
  - Faster return to activities than surgery

- Disadvantages / complications
  - Pain
  - Post-embolization syndrome: n/v, fever, cramping, myalgias, fatigue, leukocytosis
  - Bloody vaginal discharge (can persist for months)
  - Vaginal passage of myoma (2-5%)
  - Fever / infection (2-4%)
  - Ovarian dysfunction
    - Inadvertent occlusion of ovarian blood supply
    - 2-3% of women < 45yo; 8% of women > 45yo
Uterine artery embolization

- Outcomes
  - Fibroid Registry for Outcomes Data (FIBROID)
    - 3-yr prospective study eval 3000 patients, 1200 avail for final analysis
    - High rates of satisfaction, but 15% reintervention rate
      - 10% hysterectomy, 3% myomectomy, 2% repeat UAE
  - Longer (5-yr) cohort study follow-up
    - Satisfaction still in the 80% range, but 20% reintervention rate
      - 14% hysterectomy, 4% myomectomy, 2% repeat UAE
  - Embolization with Hysterectomy (EMMY) randomized controlled trial
    - Similar overall satisfaction rates, but 28% of UAE pts went on to have hysterectomy by 5 years
      - 35% (!) at 10 years
  - RCT (Czech) of 63 women randomized to UAE vs myomectomy
    - UAE better short term outcomes, but significantly higher (37 vs 6%) reintervention rate at 1.5yrs
      - Included both open and laparoscopic myomectomies

CONCLUSION: In about two thirds of uterine artery embolization- treated patients with symptomatic uterine fibroids a hysterectomy can be avoided. Health-related quality of life 10 years after uterine artery embolization or hysterectomy remained comparably stable. Uterine artery embolization is a well-documented and less invasive alternative to hysterectomy for symptomatic uterine fibroids on which eligible patients should be counseled.

Over 1/3 of patients FAILED and needed hysterectomy
- Almost almost all were abdominal hysterectomies
- TLH > TAH quality of life up to FOUR YEARS later*
- Avoided an opportunity to reduce risk
  - Uterus, cervix, ovary cancer
  - E-only hormone replacement
  - Breast cancer risk
Uterine Artery Embolization

- Pregnancy implications
  - Case series, varying comparison groups (normal OB, myomectomy patients)
  - Higher rate of preterm delivery (OR 6.2) and malpresentation (OR 4.3) compared to laparoscopic myomectomy
  - Increase in c/s, preterm delivery, PPH, miscarriage, lower pregnancy rates, abnormal placentation, compared to general OB population
  - Age and infertility as confounders

Level C (opinion/consensus):
“The effect of uterine artery embolization on pregnancy remains understudied.”

Supravascular Hysterectomy

- History
  - 1st hysterectomy: vaginal, 1813 (Conrad Langenbeck)
  - 1st abdominal hysterectomy: supracervical, 1863 (Charles Clay)
  - 1st total hysterectomy: 1929 (EH Richardson)
  - Laparoscopy→ increased numbers of supracervicals
    - Rates approach 50% in certain parts of Scandanavia
    - 7.5% in the US, 20% in California

- Postulated reasons to retain cervix:
  - Avoid vaginal shortening
  - Prevent prolapse
  - Preserve urinary, bowel function
  - Preserve sexual functioning
  - Avoid poor cuff healing or fallopian tube prolapse
  - Faster operation, less complications
Supravcervical Hysterectomy

- 9 randomized trials, 1553 subjects
- Updates from 2006 Cochrane review:
  - Six new trials
  - Twice as many subjects
  - Included long-term (>5 years) followup
  - Stratified by open or LSC approach for short-term outcomes

Primary outcomes
- Urinary function
  - Stress incontinence
  - Urinary urgency
  - Voiding dysfunction (incomplete emptying)
- Bowel function
  - Constipation
  - Incontinence (stool)
- Sexual function
  - Pain symptoms or dyspareunia
  - Satisfaction, relationship and functioning combined

Secondary outcomes
- Quality of life (validated scales)
- Operating time
- Recovery from surgery
- Length of hospital stay
- Return to normal activities
- Short term complications (pre-discharge)
  - Surgical injury
  - EBL, blood transfusion
  - Pelvic hematoma
  - Vaginal bleeding
  - UTI or other infection, fever
  - Urinary retention or bowel obstruction
Supravercival Hysterectomy

- Secondary outcomes (continued)
  - Intermediate complications (up to two years post-surgery)
    - Ongoing cyclical bleeding
    - Persistent pain
    - Need for removal of cervical stump
    - Pelvic organ prolapse
    - Gynecologic cancer

- Long term complications (> two years post-surgery)
  - Fistulae
  - Pelvic organ prolapse
  - Gynecologic cancer

- Urinary function
  - No difference in incontinence, incomplete emptying or urinary urgency
  - Both short-term and long-term
  - Both open and laparoscopic

- Bowel function
  - No difference in constipation or incontinence
  - Both short-term and long-term (incontinence)
  - No LSC studies

- Sexual function
  - No difference in sexual satisfaction
  - No difference in dyspareunia
  - Both short-term and long-term
  - Both open and laparoscopic

- Quality of life
  - Subjects reported improved quality of life, regardless of type of hysterectomy (no differences)
Supravervical Hysterectomy

- **Operation time**
  - TAH 11 min longer than open SCH
  - No difference between TLH and LSH
- **Recovery**
  - No difference in hospital stay
  - No difference in resumption of normal activities
- **Blood loss**
  - TAH 57mL greater than open SCH for EBL
  - No difference between TLH and LSH
  - No difference in transfusion rate, open or LSC
- **Fever and urinary retention**
  - More common TAH vs open SCH
- **Other complications**
  - No differences: surgical injury, hematoma, vaginal bleeding, wound infection, or bowel obstruction, readmission rate

- **Intermediate outcomes**
  - Cyclic bleeding higher in SCH
  - No differences: persistent pain, prolapse, trachelectomy or GYN cancer (rare outcomes)
- **Long-term outcomes**
  - No difference: prolapse, alleviation of preop sxss
  - Not enough data for GYN cancer

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**Supravervical Hysterectomy**

**Risks of supravervical hysterectomy**
- Cyclic bleeding (up to 11%)
  - Especially for those with h/o “fundectomy”
- Cervix dysplasia or neoplasia
- Endometrial cancer
  - 23% of trachelectomy specimens with residual endometrium
  - Combined HRT in menopause
- Need for future surgery (up to 24%)
  - Bleeding, cervical allodynia, residual endometriosis
- Morcellation

**Risks of total hysterectomy**
- Delayed resumption of penetration intercourse
- Vaginal cuff dehiscence
Supracervical Hysterectomy

- Contraindications/special populations
  - Precancerous/cancerous conditions of the cervix, smoking
  - Endometriosis
  - Pelvic pain
  - Obesity
    - Increases surgical risk
    - Higher risk for endometrial cancer

Laparoscopic trachelectomy
Supracervical hysterectomy

• Counseling (US east coast, 2003)
  – 45% OBGYNs always perform total
  – 18% counsel about advantages / disadvantages
  – 63% rarely or never counseled about advantages / disadvantages
  – 19% always offered a choice
  – 61% rarely or never offered a choice
  – Of those that offered SCH
    • 36% believed SCH offered benefits such as protection against prolapse
    • 28% would perform SCH despite abnormal pap history

• ACOG:
  – “The supracervical approach should not be recommended by the surgeon as a superior technique for hysterectomy for benign disease.”

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• Cooper K et al. Outcomes following hysterectomy or endometrial ablation for heavy menstrual bleeding: retrospective analysis of hospital episode statistics in Scotland. BJOG 2011: 118(10): 1171-9.


References


References


References


References


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Laparoscopic trachelectomy

Laparoscopic trachelectomy: Stage IV endometriosis