Retroperitoneal Dissection

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I have nothing to disclose

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Agenda

- Indications for Retroperitoneal Dissection
- Anatomy
  - Avascular Spaces
  - Ureter
- Dissection Techniques
- Uterine Artery Control at Origin
- Ureterolysis

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Indications for Retroperitoneal Dissection

- Endometriosis
- Fibroids
- Adhesive disease
  - Infection, radiation, prior surgery
- Reconstructive/Incontinence procedures
- Gyn Oncology procedures

Image: Laparoscopic Approach to the Pelvic Sidewall Video

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Avascular Spaces

- Midline
  - Retropubic
  - Vesicovaginal
  - Rectovaginal
  - Presacral
- Lateral
  - Paravesical (2)
  - Pararectal (2)

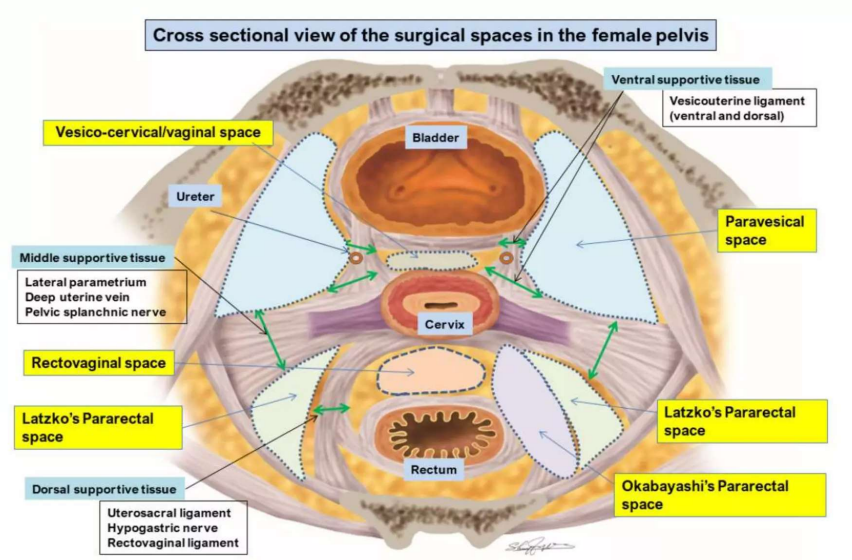

Image: Zapardiel I, Ceccaroni M, Minig L, et al. Int J Gynecol Cancer 2023;33:285–292.

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Paravesical Space

Boundaries
- Superior: lateral umbilical folds
- Anterior: Pubic symphysis
- Posterior: Cardinal Ligament
- Medial: bladder
- Lateral: pelvic walls, obturator internus and levator ani muscles

Contents:
- Umbilical artery
  - This can be grasped and see movement of anterior abdominal wall
- Superior vesical artery
- Obturator neurovascular bundle
- Lymphatic tissue

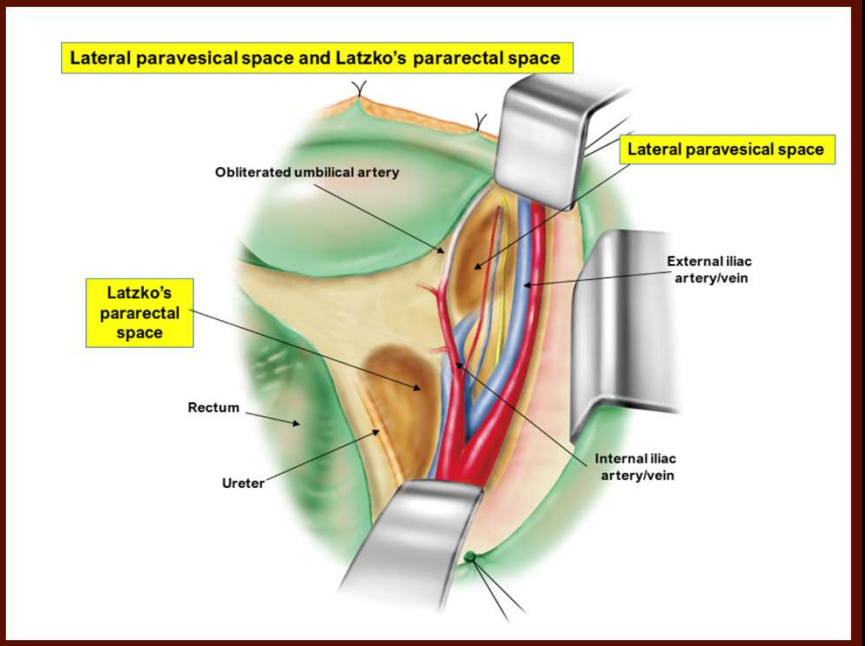

Image: Zapardiel I, Ceccaroni M, Minig L, et al. Int J Gynecol Cancer 2023;33:285–292.

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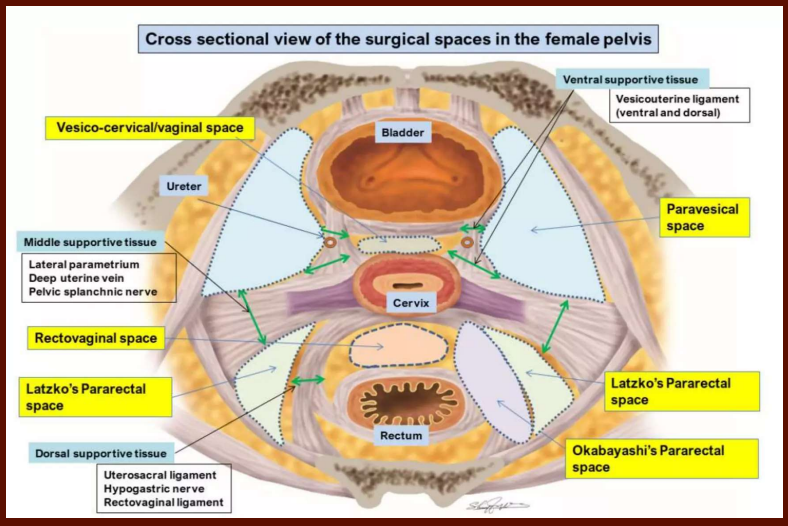
Pararectal Space

Boundaries:

- Anterior: Cardinal ligament
- Posterior: Sacrum
- Lateral: Internal iliac artery
- Medial : Rectum
- Divided by ureter
  - Latzko's space (lateral)
  - Okabayashi space (medial)



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Dissection Techniques: Key Principles

- Goal: Restore normal anatomy
  - Do the easy things first, then the hard becomes easy!
  - Majority of the time, go lateral to medial
- Let the tissue guide you
  - Pneumoperitoneum is your friend
  - If space difficult to open, you may be in wrong plane

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Dissection Techniques: Set Up

- Ensure adequate exposure
  - Tension is key!
  - Assist robotic arm and/or assistant port
  - Consider laparoscopic fan, lap-pad, or temporary suture (pexy bowel or ovary)
  - Uterine manipulator or EEA sizer
- Visualize critical structures
  - Good place to start is the round ligament
- Plan for bleeding:
  - Suction or have RAY-TEC available intra-abdominally
  - *Get the bleeders before they get you!*

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Dissection Techniques

https://surgeryu.aagl.org/view?m=6tdernQuW
(5:58)

- Tent and Cut
  - Let the Pneumo do the Work!
- Open and Spread:
  - Try to open parallel with the space you are trying to open
  - Obturator space can be opened spreading instruments UP/DOWN vs. pararectal space longitudinally along ureter
- Wiping and Teasing: Respect structures and tension
  - This helps identify spaces to open
  - Remember “Do the easy things first and the hard will become easy”
- Traction Counter-traction:
  - Frequent readjustment makes dissection easier
  - Consider placement of stitch on lesion
- CO2/Hydrodissection

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Summary

- Know your anatomy (avascular spaces, course of ureter)
- Retroperitoneal dissection can help restore normal anatomy and preserve critical structures
- Set up is KEY
- Use combination of techniques throughout dissection
- Perform retroperitoneal dissection routinely so this is easier in tricky cases!

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Endometriosis: Surgical Pearls and Pitfalls

Dr. Jacqueline Early
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November 7, 2024

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I have no financial disclosures.

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Learning Objectives

1. Overview of endometriosis, diagnosis and treatment
2. Discuss strategies for assessing endometriotic lesions and surgical planning
3. Consider strategies for excision for endometriosis
4. Review strategies for minimization of recurrence
5. Watch surgical videos to see strategy in action

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Introduction

Endometriosis: Inflammatory condition when endometrial tissue is located outside of the endometrial cavity

Prevalence: 176 million women worldwide, 10% reproductive-aged women

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Symptoms

- Pelvic pain: dysmenorrhea, dyspareunia, chronic pelvic pain
- Infertility
- Fatigue, abnormal uterine bleeding, comorbid conditions (mood disorders, autoimmune d/o), adverse effect on partner relationships, reduced productivity and income, indirect and direct healthcare costs

Zondervan KT et al. Endometriosis. N Engl J Med 2020; 382:1244-125

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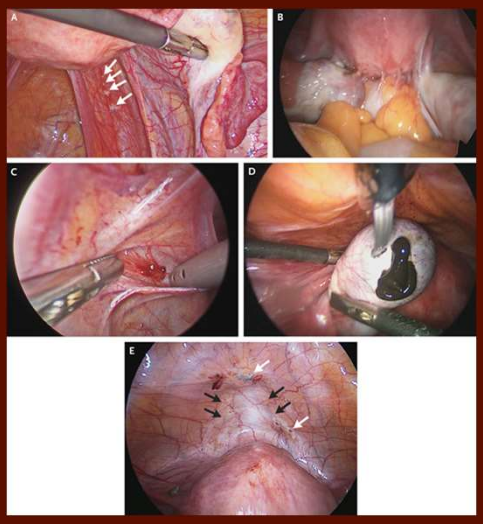
Diagnosis



Zondervan KT et al. Endometriosis. N Engl J Med 2020; 382:1244-125

3 Classifications

- Superficial peritoneal
- Ovarian lesions
- Deep endometriosis (DE)

Clinical suspicion, physical exam, Imaging

- Pelvic ultrasound and magnetic resonance imaging

Laparoscopy and Histologic Analysis

- Extrauterine endometrial glands, stroma or hemosiderin-laden macrophages
  - *Only present in ⅓ of all surgical specimens → immunohistochemistry

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Treatment

Varies significantly depending on the goals of the patient

- Medical vs Surgical
- Fertility-sparing vs Definitive
- Ovary preservation
- Infertility treatment

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Assessment of Endometriosis Lesions

History taking

- Clues for location of lesions → dyschezia, deep dyspareunia, dysuria

Physical exam

- Nodularity or tenderness → again location

Pelvic Ultrasound

Pelvic MRI

- Consider vaginal or rectal contrast

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Surgical Decision Making

Laparoscopic excision/ablation of lesions improves overall pain scores

- Not shown to affect fertility-related outcomes
- Severity of lesions does not correspond to pain scores

Risk/Benefit ratio that is acceptable to the patient

- 5% risk for anastomotic leak after bowel resection

*Leonardi, M., Gibbons, T., Armour, M., Wang, R., Glanville, E.,et al 2020. When to Do Surgery and When Not to Do Surgery for Endometriosis: A Systematic Review and Meta-analysis. J Minim Invasive Gynecol. Volume: 27 (2) 390-407.e3.

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Superficial Peritoneal Endometriosis (SPE)

National and international standard of care is surgical removal of lesions and ovarian suppressive drugs

Operative laparoscopy has better pain response than diagnostic laparoscopy

- Do not delay treatment for comorbid conditions to perform surgery
- 62% of women undergoing surgery for chronic pelvic pain and found to have endometriosis underwent repeat surgery after initial diagnosis
  - 25% had 3+ surgeries
- Risk for chronic postsurgical pain (20% of patients at 3-6 months)

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Ovarian Endometriosis

- 20% of endometriosis patients have endometriomas
  - Medical treatment is often ineffective → surgery preferred
- Decreased ovarian reserve
  - Antimüllerian hormone levels decrease by up to 40% after ovarian cystectomy
  - Sustained over 6-9 months of f/u, worse after bilateral cystectomy

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Deep Endometriosis

Endometriosis located >5mm below peritoneal surface

- Invading, associated with fibrosis, retraction of surrounding structures

Assess fertility plans

Assess prior surgical history → prior ureterolysis, bowel surgery

Restore normal anatomy

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Deep Endometriosis: Imaging

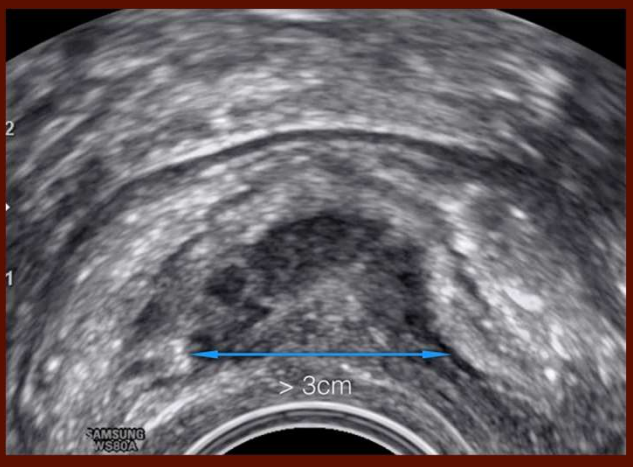

Fig 1: TVUS rectosigmoid with evidence of DE involving the rectum muscularis

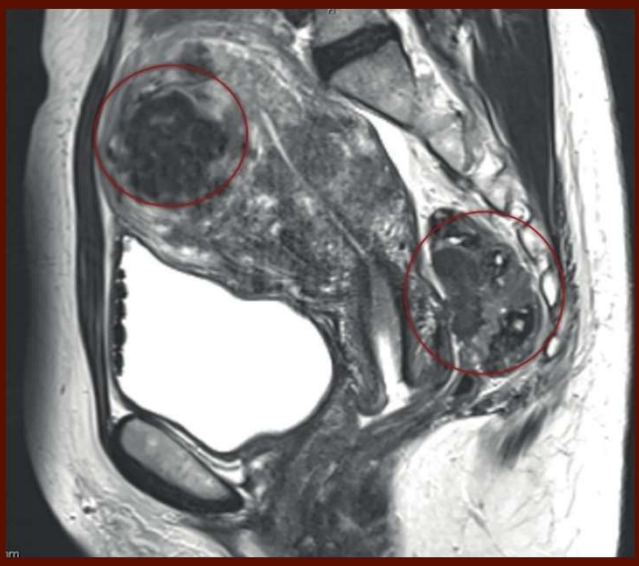

Fig 2: MRI with DE on the rectum with adhesions to the posterior cervix and adenomyosis

Images courtesy of: Working group of ESGE, ESHRE and WES. Recommendations for the surgical treatment of endometriosis Part 2: deep endometriosis †‡¶. Facts Views Vis Obgyn. 2020 Mar 27;11(4):269-297. PMID: 32322824; PMCID: PMC7162667.

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Deep Endometriosis: Bowel

Assess bowel muscularis and distance from lesion to anal verge

- Barium enema, sigmoidoscopy, colonoscopy

Fig 3: Sigmoid colon with stenosis, requires segmental resection

Images courtesy of: Working group of ESGE, ESHRE and WES. Recommendations for the surgical treatment of endometriosis Part 2: deep endometriosis †‡¶. Facts Views Vis Obgyn. 2020 Mar 27;11(4):269-297. PMID: 32322824; PMCID: PMC7162667.

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Deep Endometriosis: Bladder

Assess for silent hydronephrosis: renal sono always indicated for suspected DE involving the ureter

Consider preop or intraop cystoscopy

Fig 4: Intrinsic ureteral endometriosis with stenosis and hydroureter

Images courtesy of: Working group of ESGE, ESHRE and WES. Recommendations for the surgical treatment of endometriosis Part 2: deep endometriosis †‡¶. Facts Views Vis Obgyn. 2020 Mar 27;11(4):269-297. PMID: 32322824; PMCID: PMC7162667.

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Deep Endometriosis: Nerves

Neuropelveology is a growing field

Both endometriosis and its resection can lead to nerve damage and organ dysfunction → removal must be performed by an expert

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Extrapelvic Endometriosis

Thoracic endometriosis

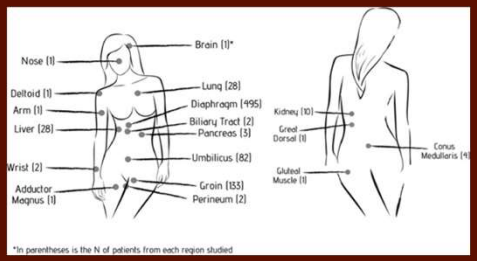
- Catamenial pain in the (right) shoulder, hemoptysis, pneumothorax

Abdominal wall → especially prior scars, umbilicus, groin

- Wide local excision preferred

Vascular, lymphatic, central nervous system, skeletal muscle, peripheral nerve

Medical or Surgical treatment



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Minimizing Recurrence

5-15% risk for recurrence after resection of peritoneal endometriosis, low complication rates

Higher complication rates and recurrence for visceral endometriosis

High rates of treatment failure with hormonal therapy alone

- If surgical resection is too high risk and treatment is necessary, consider GnRHa with bilateral oophorectomies

Consider adjuvant hormonal suppression if ovaries remain in situ

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Surgical Videos

Ureterolysis for Advanced Endometriosis: Principles and Pearls for Safe Execution: https://surgeryu.aagl.org/view?m=72jMU9O3Z

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Zondervan KT et al. Endometriosis. N Engl J Med 2020; 382:1244-125

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Fibroids – Pearls & Pitfalls

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Disclosures

- I have no disclosures

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Learning Objectives

- Recognize the prevalence of leiomyomas and identify treatment options
- Understand the importance of preoperative evaluation and surgical planning
- Discuss pitfalls and pearls for MIS approaches to myomectomy and hysterectomy
- Learn a technique for efficient tissue extraction

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Background

- Fibroids occur in up to 70% of women by menopause; approximately 25% are clinically significant enough to require intervention
- Fibroids are the leading indication for hysterectomy in the US
- Many women benefit from and seek out management options other than hysterectomy because they desire future childbearing or wish to retain their uterus

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Fibroid Treatment Options

- Expectant management for asymptomatic women or for those who do not desire intervention
- Medical treatments primarily address bleeding symptoms (heavy, prolonged bleeding)
  - Contraceptive steroids (combined, progestin only)
  - Tranexamic acid
  - 52mg LNG-IUD
  - GnRH agonists/antagonists
- Procedural/surgical interventions treat both bleeding and bulk symptoms (pelvic pressure, urinary frequency, constipation)
  - Uterine Artery Embolization
  - Radiofrequency ablation
  - MRI guided high intensity focused ultrasound
  - Endometrial ablation
  - **Myomectomy**
  - **Hysterectomy**

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Myomectomy

- Recommended for patients who desire uterine preservation or future pregnancy and are counseled about the risk of recurrence of 25% within 4 years and 12.2% rate of reintervention within 5 years
- Can be performed via hysteroscopic, laparoscopic/robotic or open approaches
  - Substantial QOL improvement has been demonstrated with all routes
- Removal of submucous fibroids are associated with higher pregnancy rates than subserosal or intramural

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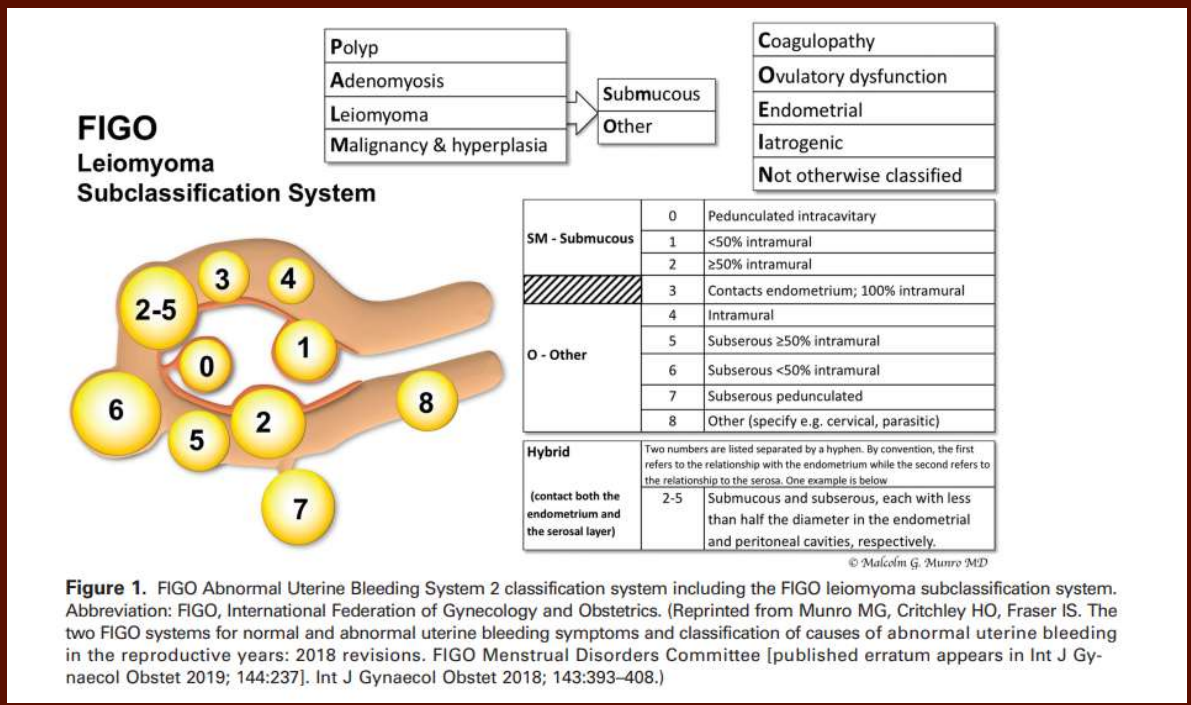

Figure 1. FIGO Abnormal Uterine Bleeding System 2 classification system including the FIGO leiomyoma subclassification system. Abbreviation: FIGO, International Federation of Gynecology and Obstetrics. (Reprinted from Munro MG, Critchley HO, Fraser IS. The two FIGO systems for normal and abnormal uterine bleeding symptoms and classification of causes of abnormal uterine bleeding in the reproductive years: 2018 revisions. FIGO Menstrual Disorders Committee [published erratum appears in Int J Gynaecol Obstet 2019; 144:237]. Int J Gynaecol Obstet 2018; 143:393–408.)

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Hysteroscopic Myomectomy

- Surgical option for type 0-2 submucosal fibroids (most successful for type 0 and 1)
- MRI, SIS, and hysteroscopy are equally effective for the detection of intracavitary lesions and are superior to TVUS, but MRI is superior to the other techniques in evaluating the relationship of submucous leiomyomas to the myometrium

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General considerations

- Submucous myomas that are type 1-5 or 2-5 traverse the myometrium and reach the uterine serosa. **Hysteroscopic myomectomy of these myomas is neither feasible nor safe** due to the risk for perforation
- Indications for submucous myomectomy include AUB, infertility, and recurrent pregnancy loss
- Submucous myomas (types 0, 1, and 2) up to 4 to 5 cm diameter can be removed under hysteroscopic direction by experienced surgeons, whereas larger and multiple myomas are best removed abdominally (i.e. laparoscopic/robotic or open)

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Pitfalls

- Trying to resect too large a fibroid or too many fibroids in one procedure
- Not planning for hemostasis and high fluid deficits

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Pearls

- Set expectations with patients
  - Only intracavitary fibroids are removed with hysteroscopy, many patients have fibroids in various locations
  - May need a staged procedure if myomas are >3cm or multiple myomas are present
  - In patient's who desire fertility in whom large or multiple opposing submucous myomas are planned for resection, consider measures for intrauterine adhesion prevention
    - intrauterine balloon, estrogen/progesterone cycling, IUD, second look hysteroscopy, etc..

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Pearls

- Inject dilute vasopressin into the cervix to decrease blood loss and fluid deficit, improving visualization and giving you more time to complete the resection
- Maintain lowest intrauterine pressure that allows you to complete the procedure (ideally at or below the mean arterial pressure to reduce systemic absorption of fluid, but not at the expense of visualization and efficiency)
- Carefully monitor fluid deficit (terminate at 2500cc of isotonic fluid or earlier) and watch for clinical signs of fluid overload
- In case of heavy uterine bleeding – cautery of bleeding vessel, bimanual massage, intrauterine balloon tamponade, uterotonics, tranexamic acid, etc..

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Laparoscopic/Robotic Myomectomy

- Less postoperative pain, shorter hospitalization, decreased risk of blood transfusion and postoperative fever as compared to open myomectomy
- MIS myomectomy has an increased recurrence risk of fibroids as compared to open approaches, especially if 5 or more fibroids are present
- Laparoscopic myomectomy is associated with a 4.5 times increased risk of conversion to an open approach compared with robot-assisted cases; otherwise, there is no clear advantage

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Importance of hemostatic techniques

- 6.5% of patients undergoing an abdominal myomectomy approach and 1.1% of patients undergoing a minimally invasive approach (laparoscopic and robotic-assisted) will require a blood transfusion
- Conversion to a hysterectomy can vary from <1% to as high as 7%
- Planning for hemostasis is especially important in patients who are anemic before surgery, at increased risk of intraoperative blood loss, or who decline the use of blood products

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Intraoperative hemostatic medications

- **Vasopressin**
- Bupivacaine + epinephrine
- Tranexamic acid
- Prostaglandins (carboprost, misoprostol)
- Oxytocin
- Topical hemostatic agents (cellulose, thrombin, fibrin sealants, etc..)

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Intraoperative hemostatic procedures

- Uterine artery occlusion (clips, clamps, embolization)
- Pericervical tourniquet
- Cautery (monopolar, bipolar)
- Harmonic scalpel
- **Barbed suture**
- Loop ligation of myoma pedicle

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Pitfalls

- Not knowing where and how many fibroids there are
- Using too much electrocautery
- Not having a plan for hemostasis
- Not achieving a hemostatic closure

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Pearls

- Utilize preop MRI for fibroid mapping and review the images yourself
- Use traction-countertraction, push and spread to avoid the need for excessive electrocautery
- Optimize Hemoglobin prior to surgery (oral or IV iron, medical therapy)
- Infiltrate dilute vasopressin for every myomectomy, be familiar with other hemostasis techniques in case they are needed
- Make your uterine incision for fibroid enucleation large enough to not struggle
- Be able to identify the endometrium (consider intrauterine methylene blue or ICG)
- Perform a multilayer closure to close dead space and minimize hematoma and adhesion formation
- Use barbed suture

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Post op counseling

- Interval to conception after myomectomy in patients with significant uterine disruption should wait three to six months before attempting to conceive
- If a patient is having difficulty conceiving following a myomectomy, early assessment of the uterine cavity and fallopian tubes with a hysterosalpingogram is advisable
- After a myomectomy in which extensive intramyometrial or complete transmyometrial dissection was required, cesarean delivery prior to the onset of labor is recommended (i.e. manage in a similar fashion to women with history of prior classical cesarean section due to risk of uterine rupture)

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Video: Myomectomy

- Indocyanine Green for Detection of Cavity Integrity during Myomectomy - SurgeryU by AAGL (show 2:51 – 6:14 at 1.5x speed)

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Hysterectomy

- Definitive management of bleeding and bulk symptoms when patients do not desire future fertility
- In general, ovarian conservation is recommended at the time of hysterectomy for fibroids
  - Increased risk of all cause mortality in premenopausal women when concomitant oophorectomy is performed, particularly in women <50 in which postop HRT is not prescribed
  - Mixed evidence on long term risks for women after hysterectomy without oophorectomy; may be an increase in cardiovascular risk, particularly in very young women (under age 35)
- Minimally invasive approaches are preferred to open whenever possible: decreased morbidity and mortality, faster recovery

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Pitfalls

- Not conducting a thorough preoperative evaluation
- Not planning for safe tissue extraction of large specimens

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What is the risk of occult Leiomyosarcoma?

- The exact risk of encountering occult sarcoma during surgery for presumed benign leiomyomas is unknown, but it was estimated at 1 in 352 by the FDA in 2014 after a highly publicized case of open power morcellation of an occult sarcoma at the time of TLH
- Based on the 2017 Agency for Healthcare Research and Quality (AHRQ) report, which used the largest and most comprehensive dataset and rigorous analytic methods to determine estimates of prevalence of leiomyosarcoma, patients may be informed that the risk of unexpected leiomyosarcoma may range from 1 in 770 surgeries to less than 1 in 10,000 surgeries for presumed symptomatic leiomyomas
- Although there is no completely reliable method to distinguish benign leiomyoma disease from uterine leiomyosarcoma, it is prudent to make every effort to diagnose a malignancy preoperatively and protect against the inadvertent dispersal of fragments of an aggressive malignancy

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Pearls

- Assess risk for occult uterine malignancy
  - Recognize that risks increase with age (especially over age 50)
  - Family history (hereditary cancer syndromes)
  - Exposures (tamoxifen, irradiation, etc.)
  - Up to date pap screening
  - Endometrial biopsy as indicated
  - Recent imaging
    - Pelvic US
    - Consider diffusion weighted and contrast enhanced pelvic MRI as indicated
  - Labs
    - Assess for anemia and optimize Hgb preoperatively (oral/IV iron, medical therapy, etc.)
    - Consider LDH isoenzymes if any concerning features on MRI
- Even in the presence of a reassuring preoperative workup, occult malignancy may still be present, highlighting the importance of both patient counseling and careful extraction techniques

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Pearls

- Use a 30 degree scope to improve visualization of the uterine vessels around bulky pathology
- Plan for specimen extraction (consider placing specimen bag early on in procedure, using a gel port or balloon trocar at site of intended extraction, keep track of fibroids by stringing them on a suture, etc.)
- Contained morcellation through vagina if good vaginal access; contained morcellation through mini-laparotomy for very large specimens or poor vaginal access

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“ExCITE,” or Extracorporeal C-Incision Tissue Extraction

- A clamp is used to grasp the tissue and provide continual upward traction with the nondominant hand while the dominant hand makes semicircular incisions on the tissue, typically with a No. 11 scalpel blade
- The clamp is used to rock the tissue back and forth in a motion opposing the circular incisions, changing the shape of the tissue into a tube that can fit through a mini-laparotomy (typically a 2-4cm abdominal incision)

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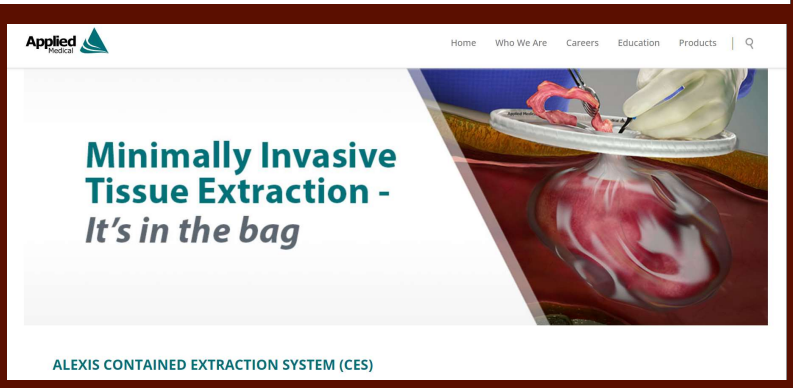

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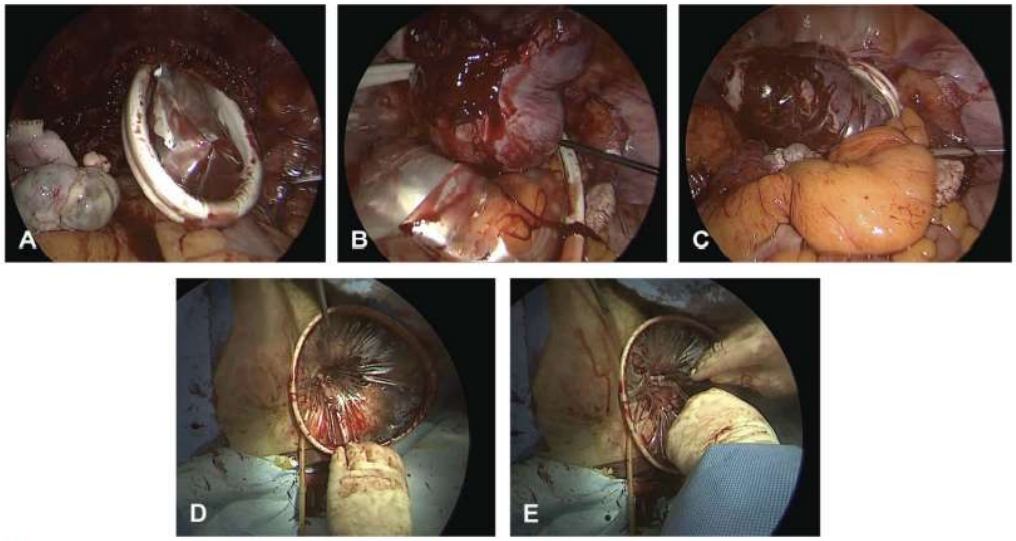

Fig. 1. Contained vaginal morcellation. **A**. The bag is introduced through colpotomy. **B**. The specimen is brought from the abdomen into the pelvis and surrounded by the bag edges. **C–D**. The edges of the bag are exteriorized through the vaginal opening. **E**. A scalpel is used to morcellate uterine tissue within the bag.

Siedhoff and Cohen. Tissue Extraction Techniques in Uterine Surgery. Obstet Gynecol 2017.

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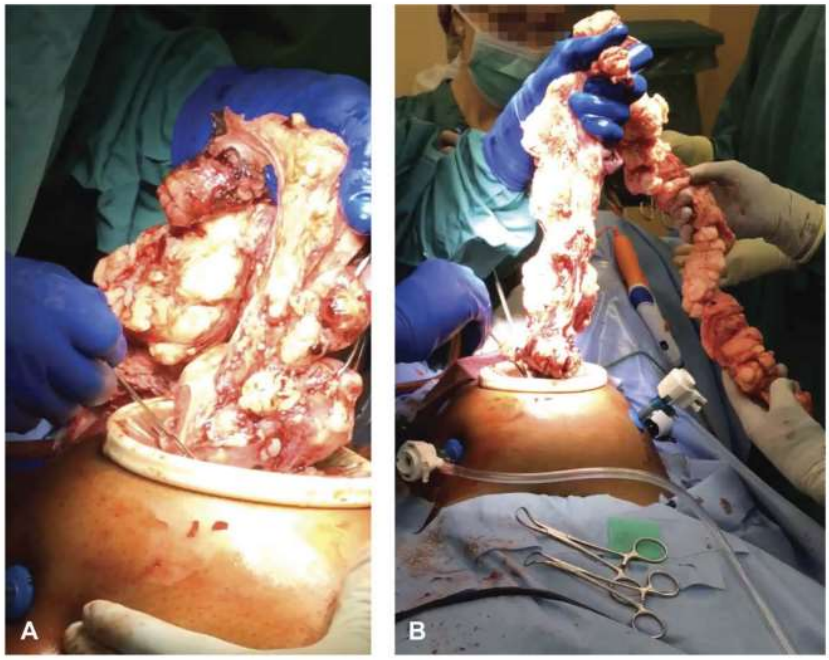

Fig. 4. Minilaparotomy morcellation. **A**. Use of a self-retaining ring retractor to maximize the small skin incision. **B**. Extraction of large-volume uterine tissue through minilaparotomy.

Siedhoff and Cohen. Tissue Extraction Techniques in Uterine Surgery. Obstet Gynecol 2017.

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Video: Tissue Extraction

- Tissue Extraction: A Simulation Model and Technical Pearls - SurgeryU by AAGL (show 04:07-06:13 at 1.5x speed)

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