Laparoscopic Dissections for Endometriosis & Pelvic Pain
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Disclosures

- Consultant
  - Applied Medical
  - Olympus
  - Caldera Medical
  - Cooper Surgical
Objectives

- Place endometriosis into the broader context of pelvic pain
- Demonstrate the benefit of excision of ablation of endometriosis
- Learn the anatomy of the avascular retroperitoneal spaces of the pelvis, the ureter, and the uterine artery as it relates to resection of deeply infiltrating endometriosis
- Show resection of superficial peritoneum involving endometriosis over vital structures (bladder, ureter, etc.) as well as deep pelvic endometriosis
- Show removal of ovarian endometrioma
- Diagnose and treat urinary and gastrointestinal tract endometriosis

Clinical Management of Endometriosis

Tommaso Falcone, MD, and Rebecca Flyckt, MD

Endometriosis is a common and challenging condition of reproductive-aged women that carries a high individual and societal cost. The many molecular dissimilarities between endometriosis lesions and eutopic endometrium create difficulties in the development of new drug therapies and treatments. Surgery remains the gold standard for definitive diagnosis, but it must be weighed against the risks of surgical morbidity and potential decreases in ovarian reserve, especially in the case of endometriomas. Safe and effective surgical techniques are discussed within this article for various presentations of endometriosis. Medical therapy is suppressive rather than curative, and regimens that are long-term and affordable with minimal side effects are recommended. Recurrences are common and often rapid when medical therapy is discontinued. Endometriosis in the setting of infertility is reviewed and appropriate management is discussed, including when and whether surgery is warranted in this at-risk population. In patients with chronic pain, central sensitization and myofascial pain are integral components of a multidisciplinary approach. Endometriosis is associated with an increased risk of epithelial ovarian cancer; however, the risk is low and currently no preventive screening is recommended. Hormone therapy for symptomatic women with postsurgical menopause should not be delayed as a result of concerns for malignancy or recurrence of endometriosis.
CHAPTER 37

SURGICAL MANAGEMENT OF PELVIC PAIN AND ENDOMETRIOSIS

Matthew T. Siedhoff and Erin T. Carey

HISTORY OF SURGERY AND PELVIC PAIN
Pelvic pain has been intimately paired with endometriosis for thousands of years. Hippocrates identified four elements he believed to be strongly suggestive of benign gynecologic disease: menstrual disorders, presence of pelvic pain, association

was performed on humans in 1910. The advent of laparoscopy was particularly welcomed by those treating pelvic pain, as it afforded a diagnostic procedure without the morbidity of a laparotomy. This was initially met with a great deal of enthusiasm because conditions such as endometriosis and adhesions could be diagnosed and eventually treated in a

GENERAL GYNECOLOGY
Could chronic pelvic pain be a functional somatic syndrome?
John W. Warren, MD; Vadim Morozov, MD; Fred M. Howard, MD

Laparoscopy has been used for decades in diagnosis and treatment of chronic pelvic pain. As a relatively safe and effective method to diagnose and treat many pelvic pathologies, its introduction represented a great step forward in the understanding of noncyclical chronic pelvic pain (CPP) in women. However, after 4 decades of laparoscopic assessment and treatment, it now appears that in many women the cause of CPP remains unknown in spite of thorough evaluation.1-4

In this opinion piece, we integrate existing data to suggest that the source of CPP in many women is not solely in the pelvis but rather has a systemic pathogenesis. Several observations from three general areas of research have been used to

The cause of noncyclical chronic pelvic pain (CPP) in many women is unknown: 30% have no identifiable pelvic pathology, and in those who do the relationship of CPP and the pathology is often unclear. Moreover, epidemiologic studies demonstrate that the common findings of endometriosis and adhesions do not greatly increase the odds of having CPP. CPP and the functional somatic syndromes (fibromyalgia, irritable bowel syndrome, and others) share many characteristics including pain as a prominent symptom and comorbidity. For the functional somatic syndromes, the initial focus of etiologic investigations has been on local mechanisms and then on systemic pathogeneses. We believe that the research trajectories of the functional somatic syndromes and CPP are converging. Their juncture might reveal an important pathologic mechanism for CPP in some women that is primarily outside the pelvis. This observation would open up new areas of exploration and treatment of CPP.

Key words: chronic pelvic pain, fibromyalgia, functional somatic syndromes, irritable bowel syndrome, laparoscopy

“The source of chronic pelvic pain in many women is not solely in the pelvis”

The host where the disease manifests is more important than the disease itself.
Central Sensitization
Pelvic pain

Increased Pressure Pain Sensitivity in Women With Chronic Pelvic Pain

Sewar As-Sanie, MD, MPH, Richard E. Harris, MD, Steven E. Harris, MD, Frank F. Tu, MD, MPH, Gina Nishimura, MPH, and Daniel J. Casiano, MD

OBJECTIVE: To determine whether women with chronic pelvic pain and variable degrees of endometriosis demonstrate altered pain sensitivity relative to pain-free healthy women in a control group and whether such differences are related to the presence or severity of endometriosis or chronic pain syndromes.

METHODS: Four patient subgroups (endometriosis with chronic pelvic pain, n=42), endometriosis with dysmenorrhea (n=35), pain-free endometriosis (n=35), and chronic pelvic pain without endometriosis (n=20) were each compared with 30 healthy women in a control group in this cross-sectional study. All patients completed validated questionnaires regarding pain symptoms and underwent screening for comorbid pain disorders. Pain sensitivity was measured using a pressure algometer.

CONCLUSION: Women with chronic pelvic pain demonstrated increased pain sensitivity at a non-pelvic site compared with healthy women in a control group, which is independent of the presence or severity of endometriosis or pelvic pain syndromes. These findings support the notion that central pain amplification may play a role in the development of pelvic pain and may explain why some women with pelvic pain do not respond to therapies aimed at eliminating endometriosis lesions.

DOI: 10.1097/01.pcp.0000859357.13135.87

LEVEL OF EVIDENCE: II

Pelvic pain

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As-Sanie 2013
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*As-Sanie 2013*
Pelvic pain

Chronic pain  No pain

Endometriosis

No endometriosis

As-Sanie 2013

Pelvic pain

As-Sanie 2013
Pelvic pain

The host where the disease manifests is more important than the disease itself

Dysmenorrhea: healthy woman
“Severe” dysmenorrhea

Chronic Pelvic Pain

Arachadonic acid

Prostaglandins

Central sensitization

Stratton 2015
Surgery in pelvic pain

• **Multifactorial** approach to evaluating pain
• Be **honest** with patients about findings
• Focus on **improvement** rather than cure
• Delineate what may be helped by **surgery** and what isn’t likely to be
• Value in “**negative**” findings in diagnostic surgery
• While surgery (including hysterectomy and removal of ovaries) can be helpful in some women, the treatment of “chronic pelvic pain” is NOT serial removal of organs

Endometriosis

- **Implants**
- **Endometrioma**
- **Deeply infiltrating**
Endometriosis

- Not localize well to symptoms
- Clear benefit to surgical treatment
- Surgery > medical treatment
- Medical: prevent recurrence and reduce symptoms
- **Excision** > ablation
  - Decrease pain
  - Decrease recurrence
  - Histologic diagnosis
  - “Tip of the iceberg”
  - Association with ovarian cancer

**Implants**


Endometrioma etiology

- Common phenotype at 20-40%
- Not a true “cyst”
- Hypotheses for formation:
  - Forms on the surface and surrounding adhesions promote invagination within the cortex to form cystic lesions
  - Metaplasia of surface ovarian epithelium and subsequent invagination
  - Implantation of Müllerian epithelium from endometrium or tube onto surface of ovary
  - Seeding of hemorrhagic CL (suppression of ovulation reduces recurrence)

Endometrioma

Falcone 2018
Endometrioma characteristics

- Cyst wall thickness 1-2mm with variable penetration of endometriosis tissue into surrounding tissue
  - Relevant if ablative techniques used
- Intense surrounding inflammation and fibrosis
- Firmly adherent to the cortex and especially deep stroma
- Adherent to uterus, contralateral ovary, rectosigmoid, ureter, sidewall with often DIE involving adherent peritoneum
- Implications for pain symptoms, difficulty in removal and challenge distinguishing endometrioma from normal ovary

Falcone 2018

Endometrioma symptoms

- Pain
- Infertility
- Palpable pelvic mass
- Incidental

Chapron 2009, Chapron 2012
Endometrioma symptoms

- Co-existence of DIE more important than the size of cyst
- High rates of concurrent DIE (30-50%) with endometrioma
- For patients with DIE, endometrioma indicates greater number and severity of DIE lesions
  - Need to be prepared to also resect all assoc dz to adequately improve pain sx. If you just remove the e-oma, only doing half the surgery
- Repeat surgery common
  - “Ovarian cystectomy” considered simple, but e-omas are difficult
  - DIE isn’t addressed
  - Experienced with endometriosis surgery because amount of dz may not always be predictable by imaging or exam

Chapron 2009, Chapron 2012

Endometrioma indications for removal

- Pain not controlled medically
- Size
  - >3cm ESHRE (European Society of Human Reproduction and Embryology)
  - >4cm ASRM (American Society of Reproductive Medicine)
- Eliminate risk of torsion
  - Unlikely given surrounding adhesions
- Prevent rupture or infection of endometrioma
- Optimize IVF
  - Endometrioma in the way
  - Avoid infection
- Pathologic diagnosis

Kennedy 2005, ASRM 2012
Endometrioma technique for removal

- Excision favored over drainage or ablative techniques
  - Improved pain reduction
  - Reduced risk of recurrence and need for additional surgery
  - Increased spontaneous pregnancy rate in those previously sub-fertile
- Vasopressin
- Hemostatic agents and suturing affect AMH less dramatically than bipolar dessication

Endometrioma

Hart 2008, Ata 2015

Deeply infiltrating endometriosis

- Dense, fibrotic disease which causes adjacent-organ adherence, invasion
- Makes its own estrogen via aromatase
- Can usually be felt on exam or seen on imaging
- Symptoms
  - Dyschezia, hematochezia with bowel disease
  - Dysuria, hematuria with bladder endometrioma
  - Dyspareunia and posterior culdesac disease
  - Subcutaneous abdominal wall endometrioma
  - Rare: ureteral or bowel obstruction, PTX in thoracic endometriosis

Deeply infiltrating

Fauconnier 2002
Deeply infiltrating endometriosis

![Image of medical condition]

Key spaces:
- Pararectal space
- Paravesical space
- Vesicovaginal space
- Rectovaginal space
- Retrorectal space
The retroperitoneum is your friend.
The retroperitoneum is your friend.

...Obeys rules
...Predictable
...Avascular
...Keeps you from guessing
...Reduces injury
...Allows vascular control
...Simplifies adhesions
...Our diseases don’t go there

Do the easy stuff first and the hard stuff gets easier.
Urinary tract endometriosis

• 1% of all patients with endometriosis, 20-50% of those with DIE
  • Superficial
  • Bladder endometriomas (80%)
    • Diagnosis
      • Sxs rarely distinguish bladder endo from other DIE
      • Hematuria rare, unusual to involve epithelium
      • Ultrasound and MRI
      • Cystoscopy (exclude malignancy / distance to ureters)
    • Treatment: partial cystectomy


Urinary tract endometriosis

• 1% of all patients with endometriosis, 20-50% of those with DIE
  • Ureteral endometriosis (20%)
    • 80% of ureteral disease is extrinsic (adventitia)
    • Rarely involves muscularis, submucosa, mucosa
  • Diagnosis
    • Silent, flank pain, incidental, hematuria (rare)
  • Treatment
    • Ureterolysis
    • Nodule resection with muscularis repair
    • Ureteroureterostomy
    • Ureteroneocystotomy

Alves 2017
Gastrointestinal tract endometriosis

• Intestinal involvement ~10% of women with endometriosis
• 90% = colorectal disease
  o Appendix, distal ileum, cecum

• Diagnosis
  o Sxs:
    ▪ Cyclic dyschezia, constipation, obstructive diarrhea, hematochezia (rare) in addition to typical sxs of DIE (dysmenorrhea, dyspareunia, noncyclic pelvic pain, infertility)
  o Palpable rectovaginal nodule if low
  o TVUS with bowel preparation, lower EUS, MRI with rectal contrast

Abrão 2015, Seracchioli 2007, Remorgida 2007, Bazot 2017

Gastrointestinal tract endometriosis

• Treatment
  o Shaving vs discoid resection (manual or circular stapler) vs segmental resection
    ▪ Skip lesions, >3cm, >40% circumference → segmental resection
    ▪ Conservative surgery may have higher risk of recurrent sxs, but better functional outcomes and lower risk of complications (e.g. leak)

Roman 2013, Roman 2018
Endometriosis special considerations

Presacral neurectomy  Appendectomy  Ovarian remnant

- Denervation of superior hypogastric nerve
- Endometriosis + midline component of pain
- RCT: 83% (v 53%) cure rate at 24mos
- Urinary, bowel dysfunction, risks

Zullo 2004
Endometriosis special considerations

- No increased morbidity in GYN surgery
- Excluding appendicitis in Ddx for pts w/ pelvic pain
- **Endometriosis** (n=400)
  - 10% any
  - 40% deeply infiltrating
  - Normal-appearing
- Prevent future emergent appendectomy
  - Endometriosis: prior surgery, adhesions

**Appendectomy**

O’Hanlan 2007, Lee 2011, Moulder 2017

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Endometriosis special considerations

**257 Incidental Appendectomies During Total Laparoscopic Hysterectomy**

Katharine A. O’Hanlan, MD, Deidre T. Fisher, MD, Michael S. O’Holleran, MD

**Laparoscopic incidental appendectomy during laparoscopic surgery for ovarian endometrioma**

Jung Hun Lee, MD, PhD; Joong Sub Choi, MD, PhD; Seung Wook Jeon, MD; Chang Eop Son, MD; Jong Won Ba, MD; He Hee Hong, MD; Kye Won Lee, MD; Yong Suang Lee, MD

Risk of appendiceal endometriosis among women with deep-infiltrating endometriosis


O’Hanlan 2007, Lee 2011, Moulder 2017
Endometriosis special considerations

Ovarian remnant

- **Etiology**
  - Incomplete excision of ovary, usually in adhesive conditions
    - Endometriosis, PID, IBD, prior surgery
  - Cystic enlargement in confined, adherent space

- **Symptoms**
  - Unilateral pain, often cyclic
  - Lack of menopausal symptoms following bilateral oophorectomy

Arden 2011, Kho 2007, Magtibay 2005

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Endometriosis special considerations

Ovarian remnant

- **Treatment**
  - Surgical excision
  - Adhesiolysis, ureterolysis, peritonectomy, isolation of uterine, bowel rsxn

- **Prevention**
  - Always open the pararectal space and skeletonize the IP during oophorectomy
  - Divide the IP at level of aortic bifurcation in adhesive conditions
  - Mobilize the adherent structures
  - Clear margins, don’t generously leave ovarian rind on bowel or sidewall

Arden 2011, Kho 2007, Magtibay 2005
References


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