

# **A Comprehensive View of Endometriosis Care**

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# Introduction to Endometriosis

- Definition: an estrogen-dependent, chronic inflammatory disorder where tissue similar to that of the endometrium (inner lining of the uterus) implants outside of the uterus
- Prevalence: affects about 10% of the population of reproductive age
- Economic Impacts: It is estimated annually in the US, that the direct cost is \$12,118 per patient and indirect cost is \$15,737 per patient

# Pathophysiology: Biological Mechanisms

- **Hormones:** Estrogen via aromatase P450 activity in the body is what leads to this tissue growth and forming of scar tissues around it
- **Immune Dysfunction:** impaired function of immune cells in the peritoneal (abdominal cavity) such as macrophages and killer cells are what cause this chronic inflammation
- **Genetics:** Patients who have a first degree relative have a 7% likelihood of developing endometriosis. Though there are certainly multiple genetic and non-genetic factors that have yet to be identified.

# Theories of Pathogenesis

- Retrograde Menstruation: during a period endometrial cells extrude through the fallopian tubes into the peritoneal cavity
- Stem Cells: during development as an embryo, cells that are precursors to endometrial cells can be misplaced into the peritoneal cavity
- Coelomic Metaplasia: peritoneal tissue can be transformed into endometrial-like tissues
- Other factors: lymphatic spread, Mullerian rest induction and alterations in the body's microbiome

# Clinical Presentation

- Symptoms: painful periods (80%), chronic pelvic pain (60%), and painful intercourse
- Sensitization: chronic inflammation over time can lead to altered pain sensation through the peripheral and central nervous systems
- Corelation: pain severity does not always corelate with the surgical stage of disease

# Different Subtypes of Endometriosis

- Superficial Peritoneal: endometrial tissue on the surface of the peritoneum
- Ovarian: often called, “chocolate cyst,” because of their appearance on the surface of the ovary
- Deep: endometrial tissue invading at least 5mm into the peritoneal tissue

# How It's Diagnosed

- Clinical Exam: Bimanual and speculum exams can identify masses, tenderness or pelvic floor muscle dysfunction
- Imaging: ultrasound is preferred - can use the “uterine sliding sign” to assess for deep tissues disease. Though MRI can be used to look for disease burden and lesions outside of the pelvis
- Biomarkers: currently we have no blood or saliva markers that reliably diagnose endometriosis

# Medical Management

## Hormonal Options

- First line: combined (estrogen and prosterone) birth control pills or progesterone-only pills
- GnRH Agonists/Antagonists: these are effective but can lead to loss of bone mineral density if they are used for longer than 6 months to 2 years
- Aromatase inhibitors: usually used for refractory cases if the above medications are not successful.
- Hormone therapy cannot be used in women who are actively trying to conceive

# Medical Management

## Non-Hormonal

- Lifestyle: physical therapy can improve the intensity of the pain; low-fat and high-fiber diets can also possibly reduce circulating estrogen
- Psychological support: cognitive behavioral therapy, mindfulness/meditation and yoga. As these patients often have comorbid anxiety and depression
- Supplements: Vitamins C and E as well as N-acetylcysteine are showing promise in reducing pain and also the size of the lesions

# Surgical Management

- Standard Method: minimally invasive - laparoscopy or robotic approach
- Techniques: for peritoneal disease these implants can be excised or ablated. For ovarian disease - removal of the entire cyst is recommended over draining the cyst because there is a risk of recurrence
- Hysterectomy is not a cure but can improve pain in patients who also have adenomyosis (endometriosis of the uterus)

# Fertility Concerns

- Impact: fecundity can decrease by 2-10% in affected patients
- Mechanism for impact: anatomy is distorted, ovarian reserve may be diminished, and chronic inflammation can cause damage to the sperm
- Obstetric risk: there are high rates of miscarriages, ectopic pregnancies, preterm labor and hypertensive disorders of pregnancy

# Delays in Diagnosis and Future Care

- Delays in Diagnosis: often 7-12 years to receive proper diagnosis. Black women are less likely to be diagnosed and are more likely to undergo early removal of the ovary
- Future techniques: AI models are being developed to predict disease based on patient-reported symptoms
- Goals: provide a model to guide interdisciplinary, patient-centered care