Bowel endometriosis: diagnosis and management

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The most common location of extragenital endometriosis is the bowel. Medical treatment may not provide long-term improvement in patients who are symptomatic, and consequently most of these patients may require surgical intervention. Over the past century, surgeons have continued to debate the optimal surgical approach to treating bowel endometriosis, weighing the risks against the benefits. In this expert review we will describe how the recommended surgical approach depends largely on the location of disease, in addition to size and depth of the lesion. For lesions approximately 5-8 cm from the anal verge, we encourage conservative surgical management over resection to decrease the risk of short- and long-term complications.

Background

Endometriosis is a chronic, estrogen-dependent inflammatory condition affecting approximately 10% of all reproductive-aged women and approximately 35-50% of women with pelvic pain and infertility.[1] Endometriosis can be classified as genital vs extragenital.[2] Endometriosis along the bowel is the most common site for extragenital endometriosis.[3,4] Endometriosis of the bowel can manifest as deeply infiltrative lesions of the muscularis or mucosa, or as superficial disease that lines the bowel serosa or subserosal area. It is estimated to affect 3.8-37% of patients with known endometriosis.[5,6] Such significant differences in the estimated incidence may be due to differences in opinion regarding the definition of bowel endometriosis, or a reflection of missed diagnosis. Furthermore, a number of women with bowel endometriosis are diagnosed with other disorders such as irritable bowel syndrome and may never actually be diagnosed with or treated for endometriosis of the bowel.[7]

Multiple theories exist regarding the true pathogenesis of endometriosis, which is complex and likely multifactorial (Table 1). Nezhat and Mahmoud[8] have suggested that the Allen-Masters peritoneal defect may act as a potential pathway to deep infiltrative endometriosis in rectovaginal endometriosis. Deposits of retrograde menstruation may lead to an inflammatory process thereby causing increased risk of adhesion formation and, ultimately, cul-de-sac obliteration.[9] Bowel endometriosis is most frequently found on the rectosigmoid colon, followed by the rectum, ileum, appendix, and cecum,[4,10] with case reports of lesions found in the upper abdomen including the stomach[11] and transverse colon.[12] Although isolated bowel involvement can be seen, the majority of patients with bowel endometriosis have evidence of disease elsewhere.[4]

Endometriosis, although generally considered a benign disease, may be associated with an increased risk of cancer. The overall risk for an endometriosis-associated neoplasm is thought to be up to 1%, with a quarter of these cases involving extraovarian tissue.[13] There have been several published cases of endometriosis-related gastrointestinal (GI) tumors, of which half involve primary adenocarcinoma of the rectosigmoid colon.[14] There remains a paucity of data on how endometriosis may specifically increase the risk of colorectal malignancy; however, evidence demonstrates an increased risk of malignant transformation in patients [T1] with endometrioid or clear cell ovarian carcinoma.[15,16] Thus, benefits of excisional surgery include not only pain relief and a potential increase in fertility, but also potential cancer prophylaxis.

Bowel resection has been performed to treat bowel endometriosis since the early 1900s.[17] Even though over a century has passed, many surgeons have not advanced their practices, with some surgeons still routinely performing segmental resection for bowel endometriosis.[18] Patients thus may be at

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TABLE 1
Theories surrounding pathogenesis of bowel endometriosis

Theory	Explanation
Retrograde menstruation	Most commonly cited theory involving retrograde flow during menses
Coelomic metaplasia[1]	Metaplastic extrauterine cells aberrantly differentiate into endometrial cells along visceral or abdominal peritoneum
Benign metastasis	Where endometrial tissue spreads through lymphatic or hematologic system to ectopic anatomic sites
Genetic and immune dysfunction	Includes possible apoptosis suppression, greater expression of invasive mechanisms, greater expression of neuroangiogenesis factors, genetic alterations of endometrial cellular function, and oxidative stress and inflammation[2,3]
Iatrogenic causes	For example, endometrial cells can be spread after surgical procedures that involve endometriosis or endometrium itself, with lesions presenting along scars such as laparoscopic port sites and cesarean delivery hysterotomies[4]
Anatomical shelter theory[5]	Rectosigmoid colon may act as anatomic barrier that prevents retrograde menstrual flow from spreading cephalad from pelvis, so that more endometriotic implants imbed along pelvis and rectosigmoid than along upper abdominal structures

1 Sourial S, Tempest N, Hapangama DK. Theories on the pathogenesis of endometriosis. Int J Reprod Med 2014;2014:179515.

2 Fortunato A, Boni R, Leo R, et al. Vacuoles in sperm head are not associated with head morphology, DNA damage and reproductive success. Reprod Biomed Online 2016;32:154-61.

3 Nezhat C, Falik R, McKinney S, King LP. Pathophysiology and management of urinary tract endometriosis. Nat Rev Urol 2017;14:359-72.

4 Buka NJ. Vesical endometriosis after cesarean section. Am J Obstet Gynecol 1988;158:1117-8.

5 Vercellini P, Chapron C, Fedele L, Gattei U, Daguati R, Crosignani PG. Evidence for asymmetric distribution of lower intestinal tract endometriosis. BJOG 2004;111:1213-7.

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increased risk of morbidity, including possible permanent ostomy, for a benign disease process that could have been managed conservatively with more modern surgical techniques. In an effort to decrease postoperative morbidity, conservative approaches including shaving excision and disc resection have been developed, but still all too many surgeons resort to overly aggressive bowel resection. Given the recognized importance for treatment of deeply infiltrative endometriosis of the bowel, surprisingly the current medical literature offers a variety of surgical approaches without an established guideline for which surgical approach is recommended for different patient presentations. This lack of clarity may unfortunately contribute to all too many patients still undergoing unnecessary segmental bowel resection. We recognize the confusion that surrounds the surgical management of deeply infiltrative endometriosis of the bowel. Whereas one size does not fit all, there are principles and approaches that may guide the surgeon to perform the most effective and least harmful procedure in particular cases. The aim of this expert review is to help clinicians navigate the management of this complex disease.

Diagnosis

Clinical presentation

Clinical suspicion for deeply infiltrative endometriosis and bowel endometriosis starts with a thorough clinical history. It should be suspected in women who report dysmenorrhea, deep dyspareunia, chronic pain, and/or dyschezia. Some women have catamenial diarrhea, blood in the stool, constipation, bloating, pain with sitting, and radiation of pain to the perineum. The pathogenesis of pain related to endometriosis is complex and multifactorial, with evidence suggesting that there may be an autonomic component explaining why symptoms may mimic that of irritable bowel syndrome.[19] Endometriotic lesions involving the enteric nervous system may cause significant damage; for example if they involve Auerbach plexus, Meisner plexus, or the interstitial cells of Cajal, they may cause nausea, vomiting, or a subocclusive crisis.[20,21] The differential diagnosis for these symptoms can be broad, including conditions such as inflammatory or ischemic colitis, radiation colitis, diverticulitis, malignancy, or pelvic inflammatory disease. If bowel endometriosis is not on the clinician's differential, the diagnosis may be missed and patients may go many years before adequate treatment.[7,21]

Physical examination, specifically rectovaginal examination, is often helpful in diagnosis, especially if performed at the time of menstruation, during which time lesions may be more inflamed, tender, and palpable. Findings may include a palpable nodule or a thickened area along the uterosacral ligaments, uterus, vagina, or rectovaginal septum. Visualization of the vagina may reveal a laterally displaced cervix or a blackish-blue lesion.[22] Bowel endometriosis may also be diagnosed incidentally at the time of surgery performed for other indications. Monitoring of CA-125 levels to diagnose and evaluate disease progression in deeply infiltrative endometriosis has been proposed but is of little utility and is not recommended.[23,24]

Imaging modalities

Transvaginal ultrasound (TVUS) can be used in conjunction with physical exam with an overall high sensitivity and specificity. Details regarding the size, location, depth of infiltration, presence Q5 of bowel lumen stenosis, and quantifi- Q6 cation of nodules are important in preoperative planning. In a meta-analysis Q7 published in 2011, Hudelist et al[27] found the overall specificity of TVUS was high

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