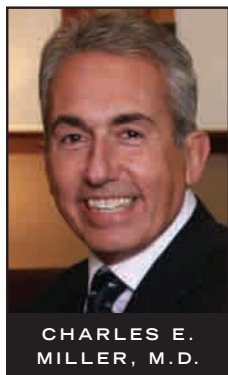


MASTER CLASS

Deeply Invasive Rectosigmoid Endometriosis



CHARLES E. MILLER, M.D.

Deeply invasive rectosigmoid endometriosis can be associated with a severe – and at times incapacitating – symptom complex. This includes dysmenorrhea – both premenstrual and menstrual – deep dyspareunia, dyschezia, and rectal bleeding at time of menses. There also

can be an impact on fertility as well, which can be rectified with bowel resection. In the accompanying graphic (right), a number of studies revealing pregnancy post bowel resection for rectosigmoid endometriosis are noted.

As bowel resection is generally not in the armamentarium of the gynecologic surgeon treating benign disease, the proper treatment of deep infiltrated rectosigmoid endometriosis must involve a cooperative effort with a colorectal surgeon who is capable of performing advanced minimally invasive surgery. This collaboration permits the minimally invasive gynecologist to laparoscopically excise endometriosis, lyse pelvic adhesions, resect ovarian endometriomata, and where indicated, perform ureterolysis and total

laparoscopic hysterectomy. The colorectal or general surgeon can then proceed with the bowel resection via a minimally invasive approach.

For this current Master Class in Gynecologic Surgery, I have solicited the expertise of Dr. John J. Park. Dr. Park is a clinical assistant professor of surgery in the division of colorectal surgery at the University of Illinois at Chicago, as well as attending surgeon at Advocate Lutheran General Hospital, Park Ridge, Ill. Dr. Park completed his residency in general surgery at the University of Illinois and his colorectal surgery residency at Mayo Clinic, Rochester, Minn. Dr. Park is board certified in general surgery and colon and rectal surgery.

DR. MILLER is clinical associate professor at the University of Illinois at Chicago, president-elect of the International Society for Gynecologic Endoscopy

(www.isge.org), and a past president of the AAGL (www.aagl.org). He is a reproductive endocrinologist and minimally invasive gynecologic surgeon in private practice in Naperville, Ill. and Schaumburg, Ill.; the director of minimally invasive gynecologic surgery at Advocate Lutheran General Hospital, Park Ridge, Ill; and the medical editor of this column. Dr. Miller said he has no financially relevant disclosures.

Pregnancy After Bowel Resection for Rectosigmoid Endometriosis

Authors	Patients wishing to conceive	Patients who became pregnant
Nezhat et al. (Br. J. Obstet. Gynaecol. 1992;99:664-7)	8	1 (13%)
Jerby et al. (Surg. Endosc. 1999;13:1125-8)	7	3 (43%)
Possover et al. (Obstet. Gynecol. 2000;96:304-7)	15	8 (53%)
Redwine and Wright (Fertil. Steril. 2001;76:359-65)	28	12 (43%)
Daraï et al. (Fertil. Steril. 2005;84:945-50)	22	10 (46%)
Lyons et al. (J. Minim. Invasive Gynecol. 2006;13:436-41)	3	3 (100%)
Ferrero et al. (Fertil. Steril. 2009;92:41-6)	46	22 (48%)
Total	129	59 (46%)

Source: Dr. Miller

Bowel Resection With Invasive Endometriosis

Deep endometriosis involving the bowel is uncommon, but not rare, among patients with pelvic endometriosis. There is a growing body of literature describing minimally invasive colorectal resection for invasive endometriosis, and a growing feeling among gynecologic surgeons that endometriosis involving the rectal wall is better treated with rectal resection than with a shaving, or scraping, technique.

In our experience of working within a multispecialty surgical team, addressing endometriosis in a systematic fashion has led to a higher rate of patient satisfaction and quality of life, a lower rate of recurrent symptoms, and less surgical morbidity than has been seen with other approaches. While still infrequent, the greatest impact of this multispecialty approach has been the more liberal inclusion of bowel resection as part of the treatment for deep pelvic endometriosis.

It is our belief that patients who have evidence of bowel involvement and have a colorectal resection as part of their endometriosis treatment ultimately have a better surgical outcome. The opposite also appears to hold true. Those patients who have endometriosis involving the bowel wall and who do not receive a bowel resection have been more prone to recurrent disease and symptoms resulting in subsequent reoperations that are often more difficult to perform than a planned colorectal resection would have been.

Furthermore, surgery involving premeditated bowel resection is often safer than treatment employing a scraping

technique when endometriosis is deep seated. In cases in which endometriosis has infiltrated the rectal wall, scraping techniques often result in unidentified bowel perforation, which leads to operations that are much more difficult to perform than planned elective resections. In addition, delayed missed injuries often will result in multiple trips to the operating room that frequently include the use of a colostomy in an otherwise young, healthy female patient.

Diagnosing Rectal Involvement

The full extent of disease, including the precise involvement of the bowel, sometimes can be difficult to determine prior to surgery.

In many cases, however, physical examination combined with endoscopy and ultrasonography is enough to diagnose bowel involvement that would best be treated with segmental resection.

Pain associated with defecation, rectal bleeding around menses, and constipation often are found on history. On physical exam, endometriosis involving the rectal wall is most commonly associated with pain on both vaginal and rectal

examination. Nodularity of the rectal wall, as well as distortion of the rectal folds, often is palpated.

The presence of either nodularity or rectal wall distortion raises the likelihood that there is significant rectal wall involvement. Conversely, if there is minimal or no nodularity of the rectal wall, the likelihood of rectal involvement is low.

When physical examination is abnormal, we proceed with colonoscopy, which enables us to visualize external compression on the rectal wall, nodularity, or other signs of endometriosis infiltrating the bowel wall. Colonoscopy is preferred because endometriosis is often found in the cecum, which would be missed on flexible sigmoidoscopy. Rarely will endometriosis actually penetrate the bowel wall. Most of the time, wall distortion with what is often seen as a submucosal mass is the only positive finding. Biopsy of the abnormality is typically un-

satisfying, with normal colonic mucosa being the most common finding on microscopy.

When there are positive endoscopic findings, we prefer endorectal ultrasonography (ERUS) over transvaginal ultrasound to further evaluate rectal wall involvement of endometriosis. Using a 10-megahertz, 3-D ultrasound, we are able to visualize if endometriosis is attached to the bowel wall and to what degree.

The most important finding is whether or not endometriosis is invading the muscularis propria by the presence or absence of a space between the lesion(s) and the muscularis propria. If a space is visualized, there is a fairly good chance that the endometriosis may be safely scraped off the rectum.

If we see, on the other hand, that the endometriosis is either invading or firmly attached to the rectal muscularis propria, we know that chances of successfully scraping the lesion(s) off the rectum will be very low. In that case, a segmental resection of the rectum can be scheduled in conjunction with the rest of the endometriosis removal. Previous endometriosis surgery, it must be noted, leads to scar tissue which will often distort ERUS images and make the exam less accurate.

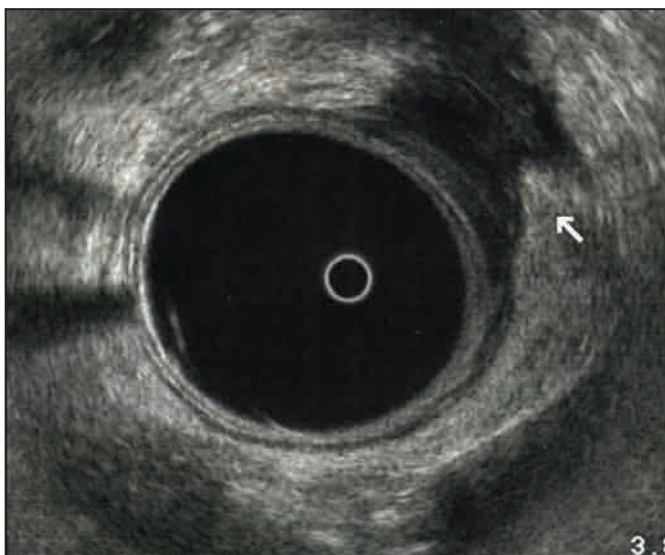
Surgical Planning

When the preoperative work-up is confirmatory, a combined surgical approach is scheduled. When the work-up is negative and the patient is scheduled for removal of endometriosis from the non-gastrointestinal organs, we remain on surgical standby because bowel involvement of endometriosis is occasionally discovered in symptomatic patients

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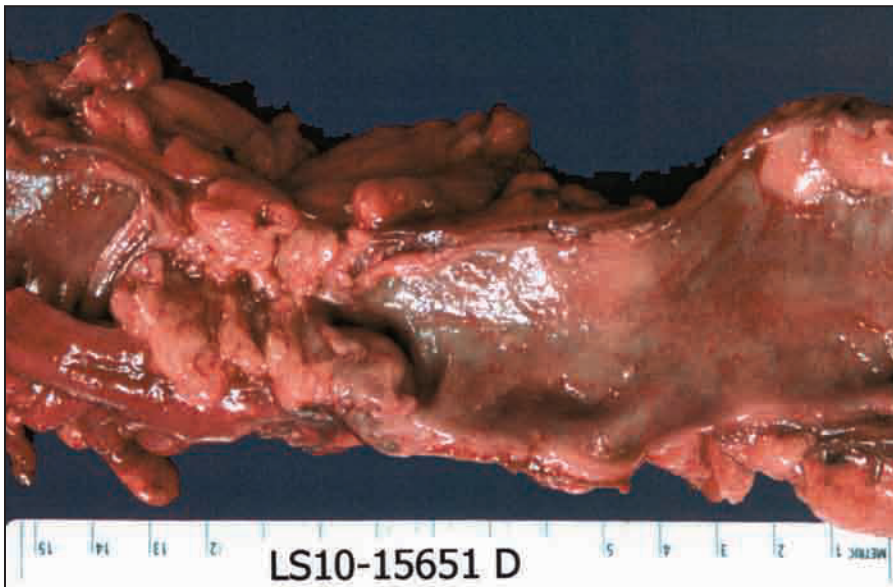


JOHN J. PARK, M.D.



An endorectal ultrasound shows endometriosis invading the muscularis propria (1 o'clock position).

COURTESY DR. JOHN J. PARK



Endometriosis invades the rectal wall. The mucosa is distorted, but intact.

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despite a negative work-up.

Standby status also allows the gynecologist to be more aggressive because rectal wall injury can be corrected at the time of surgery. Flexible sigmoidoscopy always should be performed at the end of any endometriosis operation in which bowel proximity is encountered. By submerging the bowel under water and inflating air via the sigmoidoscope, the presence of air bubbles often will identify a missed bowel injury.

Segmental resection usually involves no more than 5-6 cm of the rectum. We do, however, extend the resection a bit proximally if the patient has a history of chronic constipation. Resecting more of the rectum and sigmoid colon to straighten out the left side of the large bowel and shorten the overall length will better alleviate the patient's constipation symptoms. Combined with improvement in the patient's defecation-related symptoms associated with the endometriosis, patient satisfaction regarding the elimination of constipation symptoms is often quite high.

Basic Surgical Technique

Rectal resection for deep endometriosis is comparable to resection of a T4 rectal cancer (one that has invaded outside the rectal wall), except that in the case of endometriosis, we typically are treating young, otherwise healthy patients. In

these patients, the risk of complications – mainly, the risk of a permanent colostomy – is all the more concerning. It is important that patients understand the risk and benefits of the surgery and that the colorectal surgeon has the proper expertise for such a technically demanding, risky operation.

The operation is performed in a modified lithotomy position. A laparoscopic or hand-assisted laparoscopic approach can be used. We have performed both techniques, but find a hand-assisted laparoscopic approach faster. A robotic-assisted approach also is being developed.

Depending upon the type of camera used, a 5- or 10-mm port is placed in the umbilicus. The only other ancillary ports needed are 5-mm dissecting ports placed in the right and left lower quadrants. A mini-Pfannenstiel incision is needed to remove the rectal specimen. By extending this incision 3 centimeters, a hand port for hand-assisted laparoscopic surgery can be placed.

Surgery is initiated by the gynecologic surgeon, who resects endometriosis off all nongastrointestinal organs. Endometriosis involving the colon and rectum is left intact. If indicated, hysterectomy with salpingo-oophorectomy is performed at this time.

Next is the laparoscopic colorectal portion of the surgery. First, the inferior mesenteric artery is ligated at the

root of the aorta so that various collateral vessels within the marginal branches and Riolan's arch are not sacrificed. Usually, this ligation alone will adequately free up the sigmoid colon enough for a tension-free anastomosis. If the sigmoid colon still cannot be lowered into the rectum without undue tension, we also will ligate the rectal tributary of the inferior mesenteric vein, one of the two main tributaries of the mesenteric vein.

The remainder of the mobilization involves dissecting along the White line of Toldt until the colon falls freely into the rectum. Rarely will we need to mobilize the splenic flexure of the colon to achieve adequate length.

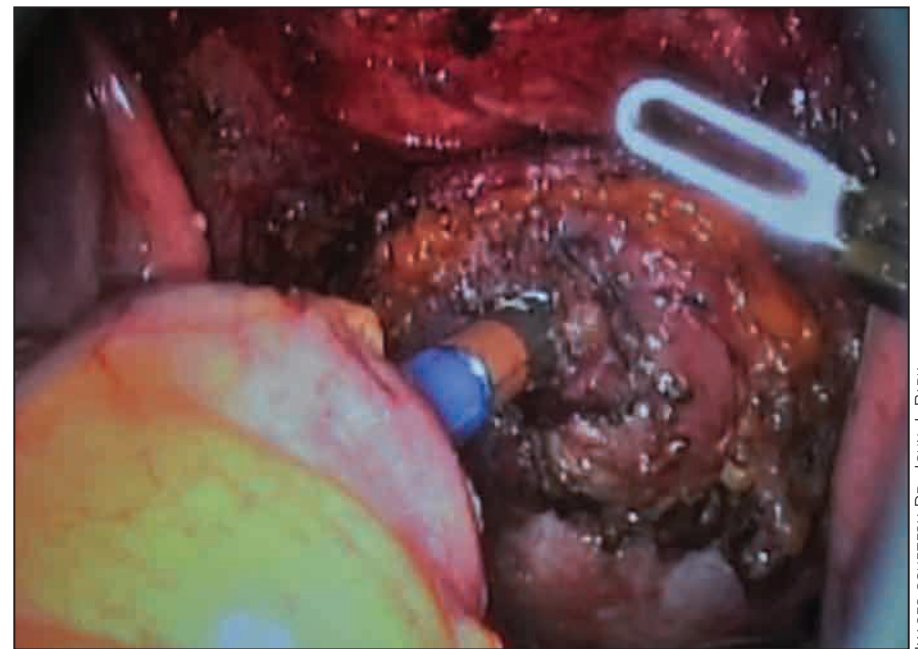
With the left side of the colon freely mobilized, we turn our attention to the pelvis and subsequent rectal dissection. We do not remove the lesion from the rectum, since we have already confirmed that the lesion is firmly attached to the rectal wall. The endometriosis is re-

while leaving it attached to the rectum – is more easily performed using a hand-assisted laparoscopic approach or even a hybrid open approach through the mini-Pfannenstiel incision.

Dissection is carried out distally until a soft, normal section of rectum is identified. At least 2 cm of normal rectum is needed for a safe anastomosis.

Endometriosis involving the bowel usually appears as a white fibrotic, submucosal mass and feels similar to invasive rectal cancer. The difference, of course, is that rectal cancer is mostly intraluminal, whereas endometriosis usually originates outside the bowel wall and invades inward. Occasionally, one will find “chocolate”-filled cysts within the endometriotic mass, but this is rare.

Endometriosis with bowel involvement is typically anterior to the rectum and posterior to the vagina, but lesions posterior to the rectum have been found, which would denote a nonanatomical spreading distribution.



The colon is being attached to the distal rectum using an end-to-end anastomosis stapler.

moved en bloc with the rectum, similar to what is done for rectal cancer.

While the lateral and posterior dissection of the mesorectum can be easily done laparoscopically or robotically, we believe the anterior dissection of the rectum – removal of the endometriosis off the posterior aspect of the vagina

There are two techniques for a low colorectal anastomosis: The hand-sewn anastomosis technique and the end-to-end anastomosis (EEA) stapler technique. The hand-sewn anastomosis has largely been replaced by the EEA stapler because stapling the proximal colon to the lower rectum is easier to perform, faster, and results in a similar anastomotic leak rate when compared to a hand-sewn anastomosis.

An anastomosis in the upper or mid-rectum has a low risk of leaking (less than 2%). Sometimes, in patients with a deep cul-de-sac, the lesion is attached to the mid-rectum and the anastomosis must be performed in the lower rectum, within a few centimeters of the anus. Low rectal anastomoses have leak rates as high as 10%. A flexible sigmoidoscopy must be performed to check for an air leak. If one is found, the anastomosis should be reconstructed or repaired. Temporary diverting ileostomy should be considered if the anastomosis is suboptimal. ■

Dr. Park said he had no relevant financial disclosures.



The inferior mesenteric artery (left) is ligated at the root of the aorta so that various collateral vessels within the marginal branches and Riolan's arch are not sacrificed. This ligation alone often will adequately free up the sigmoid colon enough for a tension-free anastomosis. If the sigmoid colon still cannot be lowered into the rectum without undue tension, the surgeon also will ligate the rectal tributary of the inferior mesenteric vein (right), one of the two main tributaries of the mesenteric vein.

