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 adhesions, resect ovarian endometriomata, and where indicated, perform uteroresection 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.

**Bowel Resection With Invasive Endometriosis**

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**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 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 in filtering the bowel wall. Colonoscopy is performed 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 unsatisfying, with normal colonic mucosa being the most common finding on microscopy.

When there are positive endoscopic findings, we prefer endorectal ultrasound (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.
Endometriosis involves 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 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 salpingooophorectomy is performed at this time.

Next is the laparoscopic colorectal portion of the surgery. First, the inferior or 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. 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, 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 removed 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—the removal of the endometriosis off the posterior aspect of the vagina—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 fibrinous, 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.