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Benign Anorectal: Rectovaginal Fistulas
Ann C. Lowry and Barton Hoexter

Although typically small in size and seemingly simple, rectovaginal fistulas are an aggravation to the patients and surgeons. Passing flatus or stool through the vagina is understandably distressing to patients; the lack of a uniformly successful repair is frustrating to surgeons.

Etiology
Obstetric injury is the most frequent cause of acquired rectovaginal fistulas but infection and other forms of trauma may also result in these fistulas. After an obstetric injury, the fistula may be manifest immediately but more frequently appears 7–10 days after delivery. Fistulas occur most often after a third- or fourth-degree laceration. Inadequate repair, breakdown of the repair, or infection may result in fistula formation. In developed nations, rectovaginal fistulas occur after 0.06%–0.1% of vaginal deliveries.\(^1\)-\(^3\) In developing countries, however, the incidence of rectovaginal and vesicovaginal fistula after childbirth is almost 3 times higher, with more than half of these fistulas being larger than 4 cm in diameter.\(^4\),\(^5\) In these countries, prolonged labor, causing necrosis of the rectovaginal septum, leads to the formation of a fistula.

Disease processes may also cause rectovaginal fistulas. Cryptoglandular infection may result in an abscess spontaneously draining into the vagina resulting in a fistula. Rectal and gynecologic malignancies may result in fistulas as a result of local extension of the tumor or secondary to treatment with radiotherapy. Women with inflammatory bowel disease, Crohn’s disease more frequently than ulcerative colitis, may develop rectovaginal fistulas. In a 23-year population-based study of patients with Crohn’s disease in Olmsted County, MN, 88 fistulas developed in 59 patients.\(^6\) Eight (9%) of the fistulas were rectovaginal fistulas. Over a period of approximately 30 years, 90 of the 886 women seen at St. Mark’s Hospital with Crohn’s disease and an intact rectum developed a rectovaginal fistula.\(^7\)

Operative trauma may also result in a rectovaginal fistula. Complications of rectal or vaginal surgery usually result in fistulas opening low in the rectum. High fistulas are most frequently complications of low stapled colorectal or ileal anastomoses. In one series of 140 patients undergoing low anterior resection for rectal carcinoma, four (2.9%) developed a rectovaginal fistula.\(^8\) The mechanism is usually that a portion of the posterior vaginal wall is included in the anastomosis or that an abscess secondary to an anastomotic leak drains into the vagina. Pouch vaginal fistulas are reported in 3%–12% of patients.\(^9\)-\(^12\) Rectovaginal fistulas are also a complication of neovaginal construction for congenital abnormalities or as sex-change procedures.\(^13\)

Fistulas have also been reported after vaginal dilatation of a radiated vaginal cuff, fecal impaction, viral and bacterial infection in human immunodeficiency virus patients and sexual assault.\(^14\)-\(^17\) Congenital rectovaginal fistulas occur but are outside the scope of this chapter.

Evaluation
There are two primary goals in the evaluation of women with possible rectovaginal fistulas: identification of the fistula site and assessment of the surrounding tissue. The type of investigation required varies with the underlying etiology of the fistula.

Identification of Fistula Site
In most women with complaints consistent with a rectovaginal fistula, the site can be readily identified on examination. Visual examination may show the dark red rectal mucosa contrasting with the pale mucosa of the vagina. A dimple may be palpable in the anterior midline on rectal examination. The rectal opening is frequently visible on anoscopy. In some women, the diagnosis may be elusive. A methylene blue test may confirm the presence of a communication and aid in locating the site. During this test, a vaginal tampon is inserted and then the patient is given an enema colored with methylene blue. If the patient retains the enema, staining on the
tampon is highly suggestive of a rectovaginal fistula. Alternatively, saline can be instilled in the vagina with the patient in the lithotomy position. The rectum is then insufflated with air and the vagina observed for bubbles.

Radiographic tests may help identify an elusive fistula. One option is vaginography. The examination is performed by instilling contrast into the vagina through a Foley catheter with the balloon inflated to occlude the vaginal opening. The technique has a sensitivity of 79%–100% for the detection of the fistula tract. Vaginography is most helpful for colovaginal and enteroxovaginal fistulas; it is less useful for low rectovaginal fistulas.\(^{15,19}\) Computed tomography scans may identify the fistula tract and characterize the surrounding tissue. Contrast material in the vagina after oral or rectal administration is diagnostic of a fistula. Suggestive evidence includes air or fluid in the vagina if there is no history of recent instrumentation.

Both magnetic resonance imaging (MRI) and ultrasound are used to identify fistulas. Small studies of endoanal ultrasound with and without contrast, MRI with and without endoluminal coils, and transperineal and transvaginal ultrasounds are available. One study comparing MRI with a coil to endoanal ultrasound found the same positive predictive value for identification of the fistula site for both tests.\(^{20}\) Accuracy could not be determined in this retrospective study. In an earlier study of endoanal ultrasound, positive predictive value was good but ultrasound only identified 28% of rectovaginal fistulas.\(^{21}\) Fistulas above the dentate line were more frequently identified than ones at or below the dentate line. Contrast enhanced ultrasound using hydrogen peroxide seems to be more accurate than nonenhanced studies.\(^{22}\) Contrast enhanced ultrasound has not been directly compared with MRI. Another group reported the use of transperineal and transvaginal ultrasound in the assessment of fistulas. The examinations successfully identified fistulas.\(^{23}\) The accuracy of the technique could not be determined because only 56% of patients underwent surgery. At present it is not clear which radiologic examination is optimal to detect elusive fistulas.

### Assessment of Local Tissue

The second goal of evaluation is to determine the etiology and to assess the surrounding tissue. The necessary tests are determined by the suspected etiology of the fistula. Symptoms of incontinence should be elicited during the history. If the mechanism of injury is childbirth, the patient with a fistula is at significant risk of a sphincter defect. In a review by the University of Minnesota, 48% of women with rectovaginal fistulas complained of incontinence preoperatively.\(^{24}\) Ultrasound or MRI should be done to assess the anal sphincter. One study found that 100% of women presenting with a rectovaginal fistula after a delivery had a sphincter defect.\(^{25}\) In another study, only 3 of 34 women with rectovaginal fistulas had an isolated rectovaginal fistula without abnormality in the perineal body or sphincter muscles.\(^{26}\) Symptoms of the fistula frequently mask anal incontinence; failure to study the sphincter may lead to a poor choice of repair and persistent incontinence postoperatively.\(^{24,26}\) Endoanal ultrasound and MRI are reported to be essentially equivalent in detection of a sphincter defect.\(^{20}\)

Multiple perianal fistulas suggest Crohn’s disease as the etiology. Evaluation of the intestinal tract by colonoscopy and contrast studies is indicated in patients with known or suspected inflammatory bowel disease. One must be careful to consider the patient’s obstetric history even if she carries the diagnosis of Crohn’s disease.

Biopsy of a detectable mass should be done for suspected malignancy. The presence of a known malignancy may dictate a workup for metastatic disease. It is critical that recurrent carcinoma be distinguished from irradiation injury. In patients with a history of malignancy treated by radiation, examination under anesthesia with biopsies is often necessary. Two series report an approximately 50% incidence of recurrent cancer on biopsies of these fistulas.\(^{27,28}\)

### Classification

A variety of classification systems exist for rectovaginal fistulas. Most systems classify by size, location, and etiology. Daniels\(^{29}\) classified fistulas by their location along the rectovaginal septum as low, middle, or high. The rectal opening is at the dentate line and the vaginal opening just inside the vaginal fourchette in low fistulas. The vaginal opening is at or near the cervix in high fistulas. Middle fistulas are located between high and low fistulas. This system is useful in that high fistulas are more likely to require laparotomy; perineal approaches are appropriate for most low and middle fistulas. However, beyond that, these categories are not very useful in guiding treatment decisions. In addition, this terminology is not applied consistently because some authors would term the low fistulas anovaginal fistulas. Others state that the rectal opening is below the dentate line in anovaginal fistulas.

Another system classifies fistulas into simple and complex categories.\(^{30}\) Simple fistulas are small (<2.5 cm), low, and secondary to trauma or infection. Complex fistulas are large, high, caused by inflammatory bowel disease, radiation, or malignancy, or persistent despite multiple failed repairs. This system separates fistulas amenable to local repairs and ones likely to require resection or the interposition of well-vascularized tissue. Simple fistulas tend to have healthy surrounding tissue and complex fistulas occur in diseased tissue which dictates the type of repair necessary.

Saclarides\(^{31}\) argues that a classification system based on etiology is the most useful for the treating physician. A system determined by etiology would take into consideration the state of the surrounding tissue both anatomically and functionally as well as the health of the patient.

None of these systems have been tested to see whether they are predictive of outcome but a strong case can be made that etiology is the best guide to patient management. Research in
this area would benefit from standardized terminology and a valid classification system.

Conservative Management

For women with small fistulas and minimal symptoms, medical management is appropriate. Optimizing the patient’s bowel function, particularly controlling diarrhea, is beneficial. Unfortunately, for the majority of women with rectovaginal fistulas, the symptoms are intolerable.

Surgical Techniques

Local Repairs

General Considerations

A local repair is appropriate for the first or second repair in women with rectovaginal fistulas and intact sphincter muscles. The type of repair is determined by surgeon expertise and size of the fistula. Colorectal surgeons typically prefer an endorectal or perineal approach whereas gynecologists favor a transvaginal approach.

Patients undergo mechanical and antibiotic preparation preoperatively. General anesthesia is used in most cases although the repairs may be performed under regional anesthesia. A urinary catheter is inserted. Prone jackknife position provides the best exposure for transanal and perineal approaches whereas lithotomy position is better for transvaginal repairs. Exposure is optimized by the use of a headlight, taping of the buttocks, and a Lone Star retractor. A Pratt bivalve anoscope will be helpful in repair of low fistulas; Wylie renal vein retractors, narrow Deaver, or malleable retractors are preferable for higher fistulas.

Simple fistulotomy is reported as an option but should be avoided because of the risk of incontinence. It is not acceptable to divide a significant portion of intact sphincter muscle and leave it to heal by secondary intention.

Fibrin Sealant

Fibrin glue instillation has been used for fistula-in-ano with some success. The technique does not differ when fibrin glue is applied to rectovaginal fistulas. Most studies that include rectovaginal fistulas report discouraging results of 0%–33% success in very small numbers of patients. Recent investigations sought explanations for the failure rate. One group presented a retrospective study of 116 consecutive endorectal advancement flaps done for both fistulas-in-ano and rectovaginal fistulas. Recurrence was not associated with prior attempts at repair, type of fistula, or the high pressure side. Several variations of the technique for endorectal advancement flaps have been reported but the general principles are the same. With the patient in the prone jackknife position and adequate exposure, a U-shaped flap is outlined with the distal end below the fistula opening. The flap should have a base 2–3 times wider than the apex. A flap of mucosa, submucosa, and circular muscle is raised for a distance sufficient to allow a tension-free repair, usually 4–5 cm. The fistula tract is debrided but not excised. Anoderm is elevated off the internal sphincter and circular muscle laterally. The muscles are approximated over the fistula opening with long-acting absorbable suture in one to two layers. The distal end of the flap including the fistula site is excised and the flap sutured in place with absorbable suture. The vaginal side is left open for drainage (Figure 14-1). Patients are typically observed overnight. They resume a normal diet with fiber supplements to prevent constipation. Diarrhea must also be controlled because it will affect healing as much as constipation. There is usually minimal discomfort and a brief recovery period. Patients are cautioned to avoid intercourse and the use of tampons for 6 weeks.

The literature contains many case series of endorectal advancement flaps (Table 14-1). The reported outcome measure is usually successful repair of the fistula; continence is rarely included. The explanation of the wide range of results is not clear. Perhaps it is the surgeon’s technique or patient selection that explains the reports with high success rates. Other considerations are that some studies include patients with concomitant sphincter repairs. One would expect that group to have a higher closure rate than patients undergoing an endorectal advancement flap alone. Some series include fistulas of multiple etiologies which may influence outcome. Even within a group of patients whose etiology is all obstetric injury, early series mix patients with and without sphincter defects. The presence of scar rather than healthy muscle under the flap intuitively would decrease the success of the repair. A recent series of endorectal advancement flaps in women with intact sphincter muscles supports that view. Eleven of 12 fistulas healed. In addition, some series report ultimate closure rates combining patients with one attempt at repair and those with repeated attempts. Watson and Phillips reported a primary success rate in 7 of 12 patients and an ultimate success in 10 of 12 patients illustrating the difference that would occur depending on the reporting method. Not all authors include both data. The number of previous repairs has been reported to affect the success rate and is not always reported. Lowry and colleagues reported a success rate of more than 80% in first and second repairs but only 55% in patients with two prior repairs. Follow-up techniques vary and may influence the accuracy of the data.

Recent investigations sought explanations for the failure rate. One group presented a retrospective study of 116 consecutive endorectal advancement flaps done for both fistulas-in-ano and rectovaginal fistulas. Recurrence was not associated with prior attempts at repair, type of fistula,
origin, steroid use, antibiotic usage, bowel confinement, or presence of a diverting stoma. There was a higher rate of recurrence in patients with Crohn’s disease. Sonoda and colleagues also found that a diagnosis of Crohn’s disease was associated with a higher failure rate in their study of 105 endorectal advancement flaps. In distinction to the first study, however, patients with rectovaginal fistulas secondary to obstetric injury also had a lower success rate. Smoking was linked to failure of endorectal advancement flap in another study. In an attempt to improve the results, that group added labial fat transposition to endorectal advancement flap. Unfortunately, the results were no different from an advancement flap alone.

Sliding flaps may also be performed on the vaginal side. An incision is made in the posterior vaginal wall near the introitus and a flap of vaginal wall is raised. Dissection is extended laterally to the ischial tuberosities to provide adequate mobility. The vaginal and rectal defects are closed with absorbable sutures. The levator ani muscles are approximated in the midline; this portion of the repair is believed to be critical to its success. The vaginal flap is then sutured in place. Success rates of 84%–100% are reported with vaginal flaps.

<table>
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<tr>
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<th>No. of patients</th>
<th>Success (%)</th>
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**Figure 14-1.** Endorectal advancement flap.
14. Benign Anorectal: Rectovaginal Fistulas

Anocutaneous flaps are an option for distal rectovaginal or anovaginal fistulas. A flap of anoderm and perineal skin is raised and advanced into the anal canal. After the fistula track is debrided, the flap is sutured into place. A diamond-shaped cutaneous flap has also been used on the vaginal side in conjunction with an endoanal advancement flap. Only a few cases have been reported with either technique.

Rectal Sleeve Advancement

An alternative transrectal approach is a rectal sleeve advancement involving mobilization of the distal rectum and advancement to cover the fistula. A circumferential incision is made at the dentate line and deepened through the submucosa. This plane is continued in a cephalad direction exposing internal sphincter muscle. Above the anorectal ring the dissection becomes full thickness. The mobilization continues until healthy, nonscarred tissue is reached and that tissue can be pulled down to the dentate line without tension. The rectum is pulled through the anal canal, the diseased portion excised, and healthy tissue sutured to anoderm below the dentate line. This technique is reported in patients with a rectovaginal fistula and inflamed anal canal and distal rectum from Crohn’s disease. In a series of five patients with rectovaginal fistulas and Crohn’s disease reported by the Cleveland Clinic, three of the patients with fecal diversion healed. One patient required two rectal sleeve advancements before healing occurred. Of the two patients without fecal diversion, one healed. Simmang et al. emphasized that this technique is useful for someone with a rectovaginal fistula and a stricture because both problems will be corrected with the procedure.

A variation is the modified Noble-Mengert-Fish technique. With this procedure, the full thickness of the anterior rectal wall is mobilized. A curvilinear incision is made at the mucocutaneous junction over the anterior 180 degrees of the anal canal. The dissection continues until the rectovaginal septum is entered. The superior limit is the vault of the vagina; the lateral margin is the full width of the rectovaginal space. There needs to be adequate dissection to ensure that the flap will reach the area of the external sphincter without tension. The flap is then anchored to the external anal sphincter and the perineal skin, forming a new mucocutaneous junction.

Older reports of this technique documented successful repair of rectovaginal fistulas in 86%–100%. Minor incontinence troubled 25% of patients. The only recent report combined this repair with sphincter reconstruction or perineal body repair in the majority of patients. The overall anatomic success was 94%; the results for the anterior rectal wall advancement alone were not reported separately.

Excision of Fistula with Layered Closure

Another option is excision of the fistula tract and layered closure. Layered closure may actually be performed through the rectum, vagina, or perineum. If done through the rectum or vagina, an elliptical incision is made around the fistula and mucosal flaps are raised for 2–3 cm. The fistula tract is excised. Vaginal mucosa, rectovaginal septum, rectal muscle, and rectal mucosa are closed in succession. Plication of the levator muscles is added by some surgeons. If done through the perineum, a transverse incision is made and extended down to the fistula tract. The fistula is then cored out of the rectal and vaginal walls and a layered closure performed.

Using layered closure, successful repair is reported in 88%–100% of patients in the small series published.

Perineo-proctotomy

Perineo-proctotomy or conversion to a fourth-degree laceration is usually performed with the patient in the lithotomy position; this approach begins with the identification of the fistula and division of the bridge of skin, subcutaneous tissue, sphincter muscle, rectal and vaginal walls overlying the fistula. The tract is excised and both the rectal and vaginal walls are dissected away from the muscle. After repair of both the rectal and vaginal defects, the external sphincter muscle is reapproximated. The muscle must be adequately mobilized to avoid tension on the repair. The perineal body is reconstructed and the skin closed (Figure 14-2).

The use of perineo-proctotomy or conversion to a fourth-degree laceration for rectovaginal fistulas is reported in women with intact sphincter muscles as well as ones with a sphincter disruption. Success rates for fistula closure range from 87% to 100% in small series. In most series, postoperative continence is not documented. Mazier and colleagues did report that none of 38 women undergoing this repair were incontinent postoperatively.

Inversion of Fistula

Inversion of the fistula is a simple technique usually performed through the vagina. The vaginal mucosa is mobilized circumferentially around the fistula. The tract is excised and a pursestring suture used to invert the fistula into the rectum. The vaginal wall is then closed over the inversion. One small series reports success in 8 of 11 patients; a more recent series reports a 100% success rate in 47 women.

Complex Repairs

The complex repairs involve the interposition of well-vascularized tissue between the rectum and the vagina; that tissue may be muscle, omentum, or healthy bowel. With the exception of transposition of the rectus muscle, the initial dissection for muscle interposition is typically through the perineum. The interposition of omentum or healthy bowel requires an abdominal procedure.

Tissue Interposition: Muscle

The most common tissue interposition technique is a sphincteroplasty utilized when a defect in the external sphincter is
present with the rectovaginal fistula. In that situation, an overlapping sphincteroplasty will correct the fistula and the incontinence. The technical details are described and illustrated in Chapter 46 on incontinence. Successful closure of rectovaginal fistulas with this operation is reported in 65%–100% of patients (Table 14-2).

When the sphincter muscle is intact or the fistula is above the sphincter muscles, rectus, bulbocavernous, gracilis, gluteus, and sartorius muscles have been used to repair rectovaginal fistulas. The perineal dissection is similar regardless of the muscle used. Preoperatively, the patients undergo a full mechanical bowel preparation and receive preoperative antibiotics. For these dissections, a Lone Star retractor and a headlight are very useful for exposure. With the patient in the prone jackknife position, a transverse perineal incision close to the vaginal introitus is made. The posterior vaginal wall is separated from the anal sphincter and anterior rectal wall until soft, pliable tissue is reached. This dissection is often difficult because of dense scarring. Care must be taken to avoid entering the rectum; a finger or anoscope in the rectum is helpful to identify the appropriate plane. The rectal and vaginal walls are closed with absorbable sutures. It is generally not necessary to trim the vaginal or rectal wall and doing so often only makes a significantly larger defect. The mobilized muscle is then inserted between the rectum and the vagina and tacked to the posterior vaginal wall. The incision is loosely closed often with a drain in place. For transposition of the rectus muscle, a midline abdominal incision is also made to allow dissection between the rectum and vagina from above as well as from the perineal side.

If the labial fat pad is chosen for transposition, the patient is placed in modified lithotomy position. Once the perineal dissection is completed, a longitudinal incision is made over the labial majora. Skin flaps are raised laterally and medially. There is often a plane similar to Scarpa’s fascia for this portion of the dissection. The dissection is continued to the periosteum of the pubis posteriorly. Superiorly the tissue is mobilized to the pubic symphysis. Once the entire fat pad with the bulbocavernous muscle is mobilized, the superior end is divided. The posterior pedicle is left intact to preserve the perineal branch of the pudendal artery. A subcutaneous, subvaginal tunnel is created from the base of the pedicle to the perineal incision. The flap is pulled through this tunnel and

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<th>Author</th>
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<th>No. of patients</th>
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sutured to the posterior vaginal wall above the vaginal and rectal closures. The labial incision is closed in two layers over a suction drain. The perineal incision is closed loosely often over a drain (Figure 14-3). When vaginal stenosis is a concern, inclusion of an island of skin from the inner thigh with the pedicle is an alternative. The use of the Martius graft is reported primarily in fistulas secondary to radiation. Aartsen and Sindram reported 100% success in 14 patients initially; they do caution, however, that after a 10-year follow-up, 8 of the 14 patients required diversion for progressive radiation damage. Others report success in 78%–84%. The details of mobilization of the rectus, gracilis, and sartorius muscles are beyond the scope of this chapter.

**Tissue Interposition: Bowel**

Healthy bowel may be interposed in one of two ways. An extended low anterior resection may be done with excision of the rectum containing the fistula and an anastomosis below. The vaginal defect is closed and if possible separated from the new anastomosis with omentum. Parks and associates described a sleeve coloanal technique when the fistula is very low. The rectum is mobilized to a level below the fistula and divided. From a perineal approach, a distal rectal mucosectomy is performed. The proximal healthy colon is pulled through the muscular sleeve covering the fistula. A hand-sewn coloanal anastomosis is then completed. Technical success is reported in 78%–100% of patients. In a review of functional results after stoma closure, 64% of patients were completely continent at 6 months and 75% at 1 year. An alternative is a procedure described by Bricker and Johnston. Through an abdominal incision the fistula is divided. The sigmoid colon is mobilized and divided. The proximal end is used for a temporary colostomy; the distal end is rotated upon itself and sutured in an end to side manner to the debrided edges of the defect in the rectal wall. When healing is confirmed with a contrast study, the proximal sigmoid colon is sutured to the loop of colon used in the repair (Figure 14-4). Bricker and colleagues reported excellent or satisfactory results in 19 of 26 patients.

**Choice of Treatment**

For any patient with a rectovaginal fistula, conservative management is an option if the symptoms are tolerable. In addition, fibrin glue instillation may reasonably be attempted particularly in low, small fistulas. The success rate is unproven but the procedure is very well tolerated and carries minimal risk. For fistulas resulting in significant symptoms, the choice of treatment largely depends on the etiology of the fistula.

**Rectovaginal Fistulas Secondary to Obstetric Injury**

Rectovaginal fistulas may close spontaneously in the early postpartum period; all others require surgery to close. It is important that the surrounding tissue be free of infection and induration before proceeding with surgery. For most patients, treatment of infection and time will allow the surrounding tissue to soften. Once the surrounding tissue is amenable to repair, timing of the repair may be chosen by the patient. Patients with significant symptoms need not wait until their childbearing is complete, although depending on the choice of repair, subsequent babies should be delivered by Cesarean section.

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**Figure 14-3. Martius Graft.**

A. Perineal dissection and mobilization of graft. B. Interposition of labial graft.
As mentioned above, an important part of the evaluation of women with rectovaginal fistulas caused by obstetric injury is assessment of anal sphincter anatomy and function. In multiple studies, the incidence of associated sphincter defect is close to 100% in this subset of patients. Therefore, both closure of the fistula and continence should be considered important outcome measures.

For women with intact sphincters and a rectovaginal fistula after childbirth, a simple local repair is recommended. Because data comparing the various repairs do not exist, the choice of the repair should be based on the surgeon’s experience. In most practices, these women represent only a small portion of the patients with rectovaginal fistulas because the majority will have a concomitant sphincter defect.

For women with sphincter defects, sphincteroplasty closes the fistula and repairs the sphincter defect. A perineo-proctotomy is also appropriate. The advantage of this technique is the excellent exposure it provides; the disadvantage is the risk of incontinence if intact sphincter muscle is divided. No direct comparison of this approach and sphincteroplasty exists but sphincteroplasty is more widely accepted.

Rectovaginal Fistulas Secondary to Cryptoglandular Disease

When rectovaginal fistulas secondary to cryptoglandular disease are reported, they represent only a small portion of most series. Evaluation must include a search and treatment of associated local sepsis with the possible use of a seton. Endoanal ultrasound should be performed to exclude an occult sphincter defect. If none is found, an endorectal advancement flap is the most frequently used procedure. Fistula closure rate is rarely documented separately for cryptoglandular fistulas so the success rate is not well established. In some series, it seems that these fistulas heal less well than other types. Insertion of fibrin glue, a vaginal advancement flap, and an anocutaneous flap would be reasonable alternatives but no data exist regarding their efficacy in this specific situation. In addition, there are no data comparing any two procedures.

Rectovaginal Fistulas Secondary to Crohn’s Disease

The treatment of patients with rectovaginal fistulas secondary to Crohn’s disease differs from other patients with rectovaginal fistulas in several ways. Given the nature of Crohn’s disease, control of symptoms becomes the primary goal as opposed to elimination of the fistula in this subset of patients. In addition, the treatment is in more flux than any other subset of patients.

Medical management with antibiotics and immunosuppressive medication was able to control symptoms but rarely close fistulas. Surgical therapy often required proctectomy because of associated proctitis and was not uniformly successful even in the absence of inflammation. Over a period of approximately 30 years, Radcliffe and colleagues at St. Mark’s Hospital identified 90 women with Crohn’s disease and a rectovaginal fistula. Eight were diverted, 34 underwent early proctectomy, and another 12 required proctectomy later. The indications for proctectomy were severe colitis or proctitis or an associated anal lesion in the majority of patients. Twelve were managed conservatively and 24 underwent a local repair. Heyen and colleagues traced the course of 28 women with Crohn’s disease and a vaginal fistula. Five required early proctectomy and seven underwent proctectomy later. Of the 16 fistulas managed conservatively, none healed. Malignancy developed in the fistula tract of two patients.

The introduction of infliximab is a recent addition to the treatment options for Crohn’s perianal fistulas. A randomized, controlled trial found that infliximab was significantly better than placebo in healing fistulas in Crohn’s disease. Subsequent studies have confirmed a 24%–55% healing rate by assessment of clinical symptoms. Most of these studies reported healing rates after a course of three infusions. Data are accumulating that some patients will require a longer course, perhaps maintenance therapy, to control symptoms. In addition, several studies using follow-up ultrasound or MRI revealed that the radiologic healing rate is lower than the clinical healing rate. One recent study showed that there was continued radiologic healing with a longer course of therapy. It also seems that a combination of surgery and infliximab is necessary in a substantial portion of patients. Results are better when drainage of local sepsis and placement of a...
seton are done before initiating infliximab. If the goal is complete healing, the seton must be removed before the completion of the course of infliximab. Another unresolved detail is whether the addition of immunosuppressive medication improves the response rate or maintenance of a response. Although this therapy is promising for perianal fistulas, it is not clear that rectovaginal fistulas respond as well. One study reported that only one of eight patients with a rectovaginal fistula had a complete response whereas another study reported no difference between simple and complex fistulas.

At the present time, the following treatment program seems reasonable. Each patient should be assessed to determine the presence of associated proctitis and undrained local sepsis. Patients with associated proctitis require appropriate medical or surgical management for that condition. In either case, any local sepsis should be drained, all tracts identified, and setons placed if appropriate. Until more definitive data are available, a trial of infliximab should be considered. Setons should be removed before the last infusion. If symptoms resolve or are minimal, then conservative therapy is appropriate. No clear recommendation regarding maintenance infliximab or immunosuppressive medication is possible at this time.

If a persistent fistula results in significant symptoms and any associated proctitis resolves, then surgical intervention is appropriate. A multitude of repairs is reported. Vaginal flaps succeeded in 13 of 14 patients in one series. All patients had diverting stomas at the time of the repair. Eradication of the fistula with an endorectal advancement flap is reported in 30%–70% of patients. Kodner reported an initial healing rate of 71% which increased to 92% with additional procedures. The Cleveland Clinic surgeons tailor the advancement flap according to the height and length of the fistula and the presence of rectal ulceration or inflammation. They report an initial healing rate of 54% and an overall success rate of 68% including repeat repairs. The necessity of diversion is controversial but it is often performed in this subset of patients. All of these results predate the introduction of infliximab. Whether the use of infliximab or other new medications will result in improved outcomes remains to be seen.

Rectovaginal Fistulas Secondary to Malignancy

The treatment of these fistulas is dictated by the type of underlying malignancy. For rectal cancer invading the vagina, resection with or without reconstruction is required. If preoperative adjuvant therapy is given, diversion before initiation of treatment may be necessary for the patient’s comfort. If reconstruction is possible, interposition of tissue between the colorectal anastomosis and closure of the vagina may prevent a postoperative fistula if a pelvic abscess or anastomatic leak occurs. For squamous cell carcinoma of the anus, a preexisting fistula or one that develops during chemoradiation often requires diversion for symptom control. If there is complete resolution of the tumor after chemoradiation, repair of the fistula with interposition of the bulbocavernous or gracilis muscle is indicated after a waiting period to allow for resolution of any acute radiation changes. It is unlikely that a local repair would be successful. If tumor persists after chemoradiation, an abdominal perineal resection is necessary. Low rates of perineal wound healing in this situation have led to the use of primary muscle flaps for wound closure. Presumably those muscles flaps would be particularly indicated if a rectovaginal fistula exists. The same principles apply when invasion of the rectum by gynecologic malignancy occurs.

Rectovaginal Fistulas Secondary to Radiation Therapy

The evaluation of patients with fistulas secondary to radiation must be more intensive than most other patients with rectovaginal fistulas. Because of their usual age, they are more likely to have significant medical conditions. In addition, it is paramount that the fistula site be biopsied to exclude recurrent cancer. Diversion for a minimum of 6 months is recommended to allow inflammation in the surrounding tissue to resolve. Decisions about surgical intervention center on the patient’s overall medical condition, the degree of symptoms caused by the fistula and any associated abnormalities, and the risk of a proposed corrective procedure. Not uncommonly, the combination of those factors makes a colostomy alone the most reasonable choice. This is particularly appropriate if the patient is experiencing significant fecal incontinence. If, however, the patient’s condition allows, a variety of surgical options exist. If the fistula is low and the rectum is relatively normal, muscle interposition through the perineum is a reasonable choice. If the fistula is high, tissue interposition through the abdomen is preferable. If a stricture or severe radiation damage exists in the rectum, rectal resection with reconstruction would eliminate that problem and the fistula. However, the morbidity can be high, e.g., 24% in one series. A Bricker procedure is less morbid and can relieve a stricture but does not avoid the potential bleeding, pain, or malignant transformation associated with leaving the rectum in place. Patient selection and operative choice must be made based on clinical experience because comparative studies do not exist.

Iatrogenic Rectovaginal Fistulas

The choice of treatment for an iatrogenic fistula is based on the causative operation. Fistulas developing after rectal resection almost always arise at the anastomosis. They have been reported after both hand-sewn and stapled anastomoses. Radiation and prior or concomitant hysterec- tomy increase the risk of fistula formation. Incorporation of the vaginal wall in the stapler is probably the most common explanation but necessitation of pelvic infection into the vagina may also occur. Obviously, prevention with adequate dissection of the rectum from the vagina before inserting the stapler and careful attention to the separation of the rectum and vagina as the stapler is fired is optimal. Once a fistula
occurs, temporary diversion is often necessary to control pelvic sepsis. Some fistulas will close spontaneously although this is less likely if the patient has received pelvic radiation. Repair is determined by the level of the fistula. High fistulas usually require repeat resection with anastomosis or interposition of omentum or muscle. Low fistulas may be amenable to rectal or vaginal advancement flaps. Large fistulas or one failing initial attempts at repair will require tissue interposition.

Persistent Rectovaginal Fistulas

There are few data regarding fistulas that persist after an attempted repair. Repeat repairs after one attempt seem to have a reasonable success rate. However, several studies report a higher failure rate after two or more procedures so subsequent options should be chosen carefully. Two reports specifically address the issue of persistent fistulas. MacRae and colleagues retrospectively reviewed 28 patients who had at least one previous attempt at repair. The etiology was obstetric injury in 14, Crohn’s disease in 5, and miscellaneous in 9. Five of the last group had fistulas considered simple; one fistula was caused by radiation. In the 14 patients with a history of obstetric injury, advancement flaps, sphincteroplasty, or coloanal anastomoses were performed. Eleven flaps were performed in nine patients with four resulting in healed fistulas. All five of the patients undergoing sphincteroplasty had successful outcomes as did the two patients undergoing coloanal anastomoses. Overall, 5 of 23 advancement flaps (29%) in 17 patients were successful. Sphincteroplasty succeeded in six of seven patients (86%); four of six coloanal anastomoses (67%) and both of two gracilis muscle interpositions succeeded.

In a report from the Cleveland Clinic, Halverson et al. retrospectively reviewed 35 patients with recurrent rectovaginal fistulas. Causes of the fistulas included obstetric injury in 15, Crohn’s disease in 12, pouch vaginal fistulas in 5, cryptoglandular disease in 2, and iatrogenic after low anterior resection in 1. Advancement flap, sphincteroplasty, rectal sleeve advancement, insertion of fibrin glue, and ileal pouch revision were used. The results are presented by etiology and by type of repair but not stratified by both. All 15 obstetric patients were ultimately healed after 23 repairs. Two of the four cryptoglandular fistulas were eradicated. Nine of the 30 mucosal advancement flaps (30%) and 9 of 14 sphincteroplasty procedures (65%) successfully closed the fistulas. Rectal sleeve advancement resulted in healing in two of three fistulas. Crohn’s disease, the presence of a diverting stoma, and decreased time interval from a prior repair were associated with a poor outcome regardless of the technique used. The authors commented that the presence of a stoma likely was a marker for more complex disease.

From the data available, it seems that a reasonable approach to recurrent rectovaginal fistulas would begin with a planned waiting period of a minimum of 3 months. In the interval, the status of the sphincter muscle and surrounding tissue should be evaluated. Any areas of sepsis must be drained. For low fistulas, the treatment choice depends on the status of the sphincter and the number of prior repairs. If the sphincter muscle is intact and the patients had undergone only one or perhaps two previous repairs, a repeat advancement flap or rectal sleeve advancement would be appropriate. Insertion of fibrin glue is a safe alternative but there are few data regarding the expected success rate. If there is a defect in the sphincter muscle, sphincteroplasty is the appropriate choice. Conversion to a fourth-degree laceration followed by a layered repair may be chosen by some surgeons. If the muscle is intact and two or more repairs have failed, a tissue interposition technique should be considered. Tissue interposition may also be required for recurrent fistulas with anatomically intact sphincter wraps. The insertion of bulbocavernous muscle is the least morbid transposition method but there are no comparative data regarding outcomes of the various interposition methods. The role of diversion is not established but seems to be primarily control of symptoms except perhaps in patients with Crohn’s disease.

Recurrent fistulas involving the middle of the vagina almost always require tissue interposition. The choice depends on the level of the fistula and the body habitus of the patient. The bulbocavernous muscle may not reach if the patient is obese or the fistula is in the upper middle third of the vagina. Gracilis muscle would be a good alternative in those situations. High fistulas require resection or tissue interposition through an abdominal approach.

Conclusion

The literature on rectovaginal fistulas documents a wealth of clinical experience. However, there is a definite lack of uniform terminology, standardized evaluation, and comparative studies. Given the multitude of etiologies and the varying nature of the anatomy and condition of surrounding tissue, improving the quality of research will be challenging. However, continued work is necessary to determine appropriate patient selection and optimal surgical repair.

References

14. Benign Anorectal: Rectovaginal Fistulas


17. Parra JM, Kellogg ND. Repair of a recto-vaginal fistula as a result of sexual assault. Semin Perioper Nurs 1995;4:140–145.


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