14. Benign Anovaginal and Rectovaginal Fistulas

David A. Etzioni and Ann C. Lowry

Introduction

- Although not life threatening, passing stool and flatus through the vagina is distressing for the patient.
- The lack of a uniformly successful surgical repair for rectovaginal fistula (RVF) is frustrating for the surgeon.

Etiology

- RVF can be acquired or congenital. Acquired is the focus of this outline.
- An obstetrical injury is the most common cause of an acquired RVF. An inadequate repair, breakdown of the repair, or an infection may result in fistula formation commonly 7–10 days after delivery.
- In developed countries, RVF occurs after 0.06–0.1 % of vaginal deliveries.
- In developing nations, the incidence of RVF is three times higher than developed countries, and over half of the fistulas are >4 cm in diameter. These large fistulas are due to prolonged labor with necrosis of the recto-vaginal septum.
- Cryptoglandular abscesses that spontaneously drain into the vagina.
- Inflammatory bowel disease (IBD), most commonly Crohn's disease.

D.A. Etzioni, MD, MSH
Department of Surgery, Mayo Clinic Scottsdale, Phoenix, AZ, USA

A.C. Lowry, MD (✉)
Department of Colon and Rectal Surgery, University of Minnesota,
6363 France Ave S, Ste 212, Minneapolis, MN 55435, USA
e-mail: alowry2@ix.netcom.com

- Operative and nonoperative trauma. Low fistula may result from rectal or vaginal surgery, while high fistulas typically are due to complications of a stapled anastomosis. Other examples: a stapled transanal rectal resection, an ileopouch anal anastomosis, dilatation of a radiated vaginal cuff, fecal impaction, infection in patients with human immunodeficiency virus, and sexual assault.
- Anorectal and gynecologic malignancies either by direct extension, after radiotherapy, with shrinkage of the tissue from chemotherapy, or the use of antiangiogenic chemotherapy.

Evaluation

- Initially confirm the fistula, and then evaluate the anatomy to plan treatment.

History

- A history of anorectal or gynecologic malignancy should prompt a thorough evaluation including prior treatment with radiation therapy. Recurrence will need to be investigated and ruled out.
- Continence should be documented since up to 48 % of patients with RVF can have fecal incontinence preoperatively. If the etiology of an RVF is childbirth, the patient is at a significant risk of having a sphincter defect.
- Bowel function should be documented.
- IBD or concerns that IBD may have caused the RVF should prompt evaluation of the intestinal tract with colonoscopy and radiological studies to allow for preoperative medical optimization and planning.

Physical Examination

- Fluctuance, cellulitis, or any other issues pointing to active infection should prompt an exam under anesthesia with drainage (with or without a seton).
- A mass palpated on exam should prompt a biopsy especially when there has been a history of pelvic malignancy. For patients who have had pelvic radiation, an exam under anesthesia with biopsy may be required if a thorough evaluation is not possible in the clinic.
- On digital exam, a palpable dimple in the anterior midline may represent the rectal opening of the RVF.
- Multiple perineal fistulas suggest Crohn's disease.
- If the rectal opening cannot be appreciated on digital exam or seen with anoscopy, a methylene blue test may be helpful. In the prone position, a tampon is placed in the vagina, and 20–30 cc of dilute methylene blue is instilled in the rectum. Staining on the tampon is diagnostic of RVF.

- Alternatively, in the lithotomy position, saline is instilled in the vagina and air injected per rectum. The vagina is observed for bubbles.
- The sphincter function should also be assessed.

Radiography

- There is no clear "best" radiologic test to detect an elusive fistula.
- Vaginography is most helpful in identifying a colovaginal or enterovaginal fistula. A balloon-tipped catheter is placed in the vagina and the balloon inflated to occlude the vagina. Contrast is instilled in the vagina. This test may not demonstrate a low RVF as the vaginal opening may be covered and occluded by the balloon.
- Computed tomography (CT) performed using oral and rectal contrast may delineate the fistula and characterize the surrounding tissue. Fluid or air in the vagina is suggestive of an RVF.
- Magnetic resonance imaging (MRI) and endorectal ultrasound may also be useful to identify the fistula. Additionally they have a role in evaluation of the anal sphincter muscles particularly in patients with an obstetric-related RVF.
- CT, MRI, and endosonography also can be used to rule out ongoing sepsis.

Classification

Fistula Height

- Low fistulas have their rectal opening at the dentate line and the vaginal opening just inside the vaginal fourchette. Typically, surgical repair can be performed via a perineal approach.
- Middle RVFs are located between high and low RVF.
- High RVFs have a vaginal opening near the cervix, and repair typically requires an abdominal approach.
- True RVFs have their bowel opening at or above the dentate line.
- Anovaginal fistulas have a rectal opening distal to the dentate line.
- Most fistulas involving a communication from the bowel to the vagina or perineum are referred to as RVF perhaps incorrectly. For simplicity in this outline, all fistulas will be cited as RVF (RVF).

Simple vs. Complex Fistulas

- *Simple fistulas* are <2.5 cm in size, located distally along the rectovaginal septum and secondary to trauma or infection.
- *Complex fistulas* are large in size, located high along the rectovaginal septum, caused by IBD, radiation or malignancy, or persistent after failed repair(s).
- *Simple fistulas* may be amendable to local repairs, while complex fistula may require resection or interposition possibly with fecal diversion.

Surgical Management

General Considerations

- The patient preoperatively performs mechanical bowel preparation, and antibiotics are administered just before the surgical incision.
- Usually the repair is done with general anesthesia although regional may be appropriate.
- A Foley catheter is placed. For transanal and perineal approaches, the prone position is chosen. For vaginal approaches, the lithotomy approach is chosen.
- Appropriate lighting (may require a headlight) and retractors (Lone Star, Pratt bivalve, Fansler, Wylie renal vein retractor, narrow Deaver, and malleable retractor) should be available.

Fistulotomy

- In very select and very low fistula involving no sphincter muscle, a simple fistulotomy may be appropriate.
- Fistulotomy is avoided if there is any concern this unroofing the fistula could lead to fecal incontinence.

Fibrin Sealant

- Success has been reported in small studies by instilling fibrin glue in the fistula tract or under a mucosal advancement flap.
- The risk to surrounding structures and success rates are low.

Mucosal Advancement Flaps

- Can be done from the transanal or vaginal approach. The anal approach is intuitively preferable since that repair is on the high-pressure side of the fistula (Fig. 14.1).
- Postoperatively patients are given a normal diet and fiber supplements. Constipation and diarrhea should both be avoided using medical management. Patients should abstain from intercourse and using tampons for 6 weeks.
- The transvaginal repair—technique:
    - A vaginal flap is raised starting near the introitus.
    - The flap is developed laterally to the ischial tuberosities for adequate mobility.
    - The rectal defect is closed with absorbable sutures.
    - The levator ani muscle is approximated in the midline. This maneuver is felt to be critical for success.
    - The vaginal flap is secured with absorbable sutures.
- Another variation for a flap repair is a retrograde anocutaneous flap, used for very low fistula. A flap of anoderm and perineal skin is raised, advanced into the anal canal, and sutured in place.
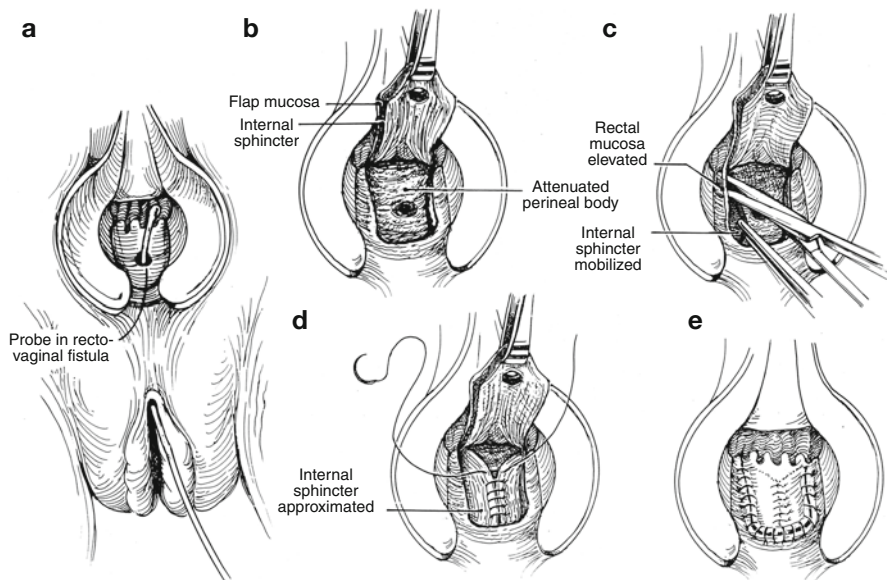
Fig. 14.1 Endorectal advancement flap. (**a**) The patient is placed in the prone position. (**b**) A U-shaped flap of mucosa, submucosa, and internal sphincter is raised. (**c**) The dissection is usually 4–5 cm cephalad to allow a tension-free repair. The base should be two to three times wider than the apex to prevent ischemia. (**d**) The fistula tract is debrided (not excised) and the muscles reapproximated with one to two layers of long-acting absorbable sutures. (**e**) The distal end of the flap with the fistula is excised, and the flap is sutured in place. The vaginal side is left open for drainage

- In the literature, success rates for advancement rectal flaps range from 29 to 100 %. Disturbances in continence range from 21 to 40 %.
- In an effort to improve success, transposition of labial fat beneath an endorectal advancement flap was done. However, no improvement in successful fistula closure was found.
- Transanal endoscopic microsurgery (TEM) has been used to facilitate repair with success in small studies.
- Smoking has been linked to unsuccessful closure of fistula when using advancement flaps.

Fistulectomy with Layered Closure

- Excision of the fistula and closure of the tract in layers can be done via the rectum, vagina, or perineum.
- Transanally, an elliptical excision is made to core out the fistula, and 2–3 cm mucosal flaps are raised. Vaginal mucosa, rectovaginal septum, rectal muscle, and rectal mucosa are closed in successive layers. Plication of the levator muscles can be added.
- For a perineal approach, a transverse incision is made between the anus and vagina. The incision is deepened until the tract is encountered.

The tract along with the openings in the rectal and vaginal walls is excised. The wound is closed in layers.
- In a small series, success with these approaches has been reported in 88–100 %.

Rectal Sleeve Advancement

- Circumferential mobilization of the distal rectum with advancement to cover the anorectal side of the fistula is reserved for fistula associated with an anal stricture or disease in the proximal anal canal/distal rectum.

Technique

- The patient is prepared as for the endorectal advancement flap.
- Starting at the dentate line, a circumferential incision is created that deepens through mucosa and submucosa but not through the internal sphincter. The dissection is continued cephalad becoming full thickness above the anorectal ring.
- Dissection is continued until healthy nonscarred tissue can be pulled down to the dentate line without tension.
- The diseased distal end is trimmed, and the healthy tissue is sutured to the anoderm.
- One reported variation in treating recurrent RVF is to perform this repair using the Kraske approach.
- Another variation is the Noble-Mengert-Fish technique. A 180° full-thickness anterior rectal wall flap is mobilized cephalad to the vaginal vault. The lateral margins are the full width of the rectovaginal space. The flap must reach the external sphincter muscle without tension. Success rates have been documented between 86 and 100 % with minor incontinence in 25 %.

Sphincteroplasty and Perineo-proctotomy

Sphincteroplasty

- For this procedure, a probe is inserted through the fistula, and it is unroofed converting the anatomy to a fourth-degree laceration. Then a layered anatomical repair is done.
- If there is a defect in the external sphincter muscle, this repair obliterates the fistula while repairing the muscle.
- Successful closure is reported for 65–100 % of patients.

Perineo-proctotomy

- When there is an intact sphincter muscle, this repair is termed a perineo-proctotomy. When the fistula is unroofed, the sphincter is divided. Figure 14.2 describes and illustrates the procedure.
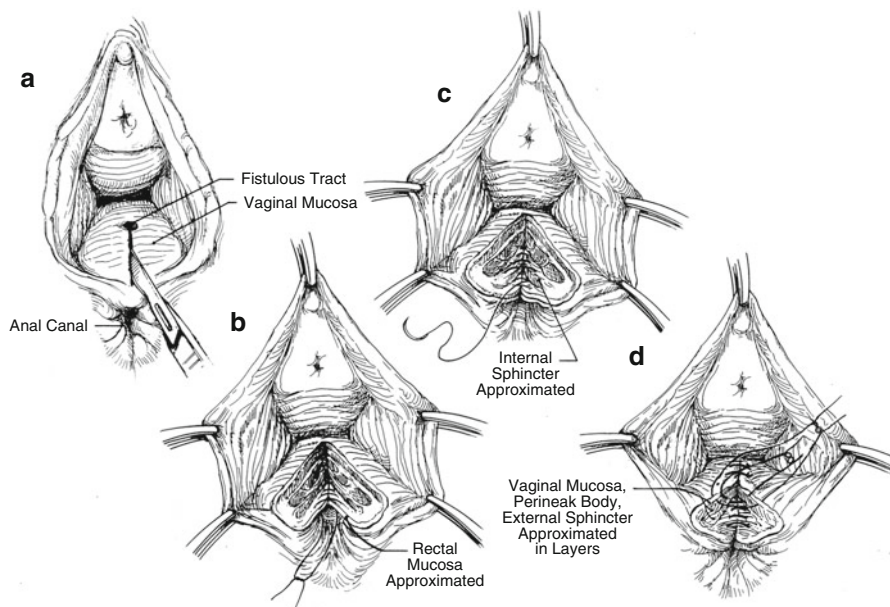
Fig. 14.2 Perineo-proctotomy. (**a**) For a perineo-proctotomy, there is intact sphincter muscle. The fistula is still unroofed to create a defect like a fourth-degree obstetrical laceration. (**b**) The tract is excised, and the vaginal and rectal walls are dissected away from the sphincter muscle. The rectal mucosa is approximated. (**c**) The internal sphincter muscle is sutured together. (**d**)The external sphincter muscle and then the vaginal mucosa are reapproximated. The perineal body is reconstructed and the skin closed

- The deliberate division of an intact sphincter muscle should be approached with caution (the perineo-proctotomy) as the impact on continence has not been well studied. Success rates have been reported from 87 to 100 %.

Inversion of Fistula

- Usually performed through the vagina, the vaginal mucosa around the fistula is mobilized and the tract is excised. A purse-string suture is used to invert the fistula into the rectum. The vaginal wall is closed over this inverted tissue.
- Ligation of the intersphincteric fistula tract (LIFT) uses a similar technique. An intersphincteric dissection is carried out, and the fistula tract is identified and divided. The openings on the rectal and vagina side are ligated and the wound closed. Success rates of 60–94 % have been reported.
- Patients with a complex transsphincteric fistula and an intact sphincter may be the best candidate for the LIFT.

Tissue Interposition

General Considerations

- Tissue interposition allows well-vascularized tissue to be placed between the vagina and rectum. Sources include rectus, bulbocavernous, gracilis, gluteus, and sartorius muscle.
- The perineal dissection is similar for all types of interposition. Dissection in the rectovaginal septum allows separation of the posterior vaginal wall from the anal sphincter and distal rectum. This dissection is carried cephalad until soft pliable tissue is reached. Dense scarring can make the dissection difficult. Injection of saline in the rectovaginal septum may help facilitate the separation and avoid inadvertent entry into the rectum.
- The rectal and vaginal openings are closed with absorbable sutures. Trimming the openings is generally not needed and only makes the hole larger.
- The mobilized muscle is rotated and inserted between the rectum and vagina and secured in place. The incision is closed loosely over a (closed) suction drain.

Labial Fat Pad or Bulbocavernous Muscle

- The mobilized labial fat pad is known as the Martius flap. In the lithotomy position after the above perineal dissection is performed, a longitudinal incision is made over the labia majora, and skin flaps are generously raised laterally.
- The fat beneath the flaps is encompassed and freed from the periosteum of the pubis posteriorly working superiorly to the pubic symphysis.
- When the entire fat pad with the bulbocavernous muscle is mobilized, to provide maximal length, the anterior end is divided as close to the pubic symphysis as possible. This preserves the posterior pedicle (with the perineal branch of the pudendal artery).
- A generous tunnel is made from the base of the pedicle to the perineal incision, and the flap is rotated through the tunnel into the perineum.
- The flap is sutured to the posterior wall of the vagina ensuring that it reaches cephalad to the closed fistula site. The labial and perineal incisions are closed (Fig. 14.3).
- If vaginal stenosis is a concern, inclusion of an island of inner thigh skin with the pedicle can be added.
- Success for this technique is reported to be 78–84 %.

Bioprosthetics

- Placement of a bioprosthetic sheet composed of porcine intestinal submucosa has been laid transperineally to separate a rectal and vaginal fistula repair. Also this material has been rolled as a "plug" inserted into the RVF tract.
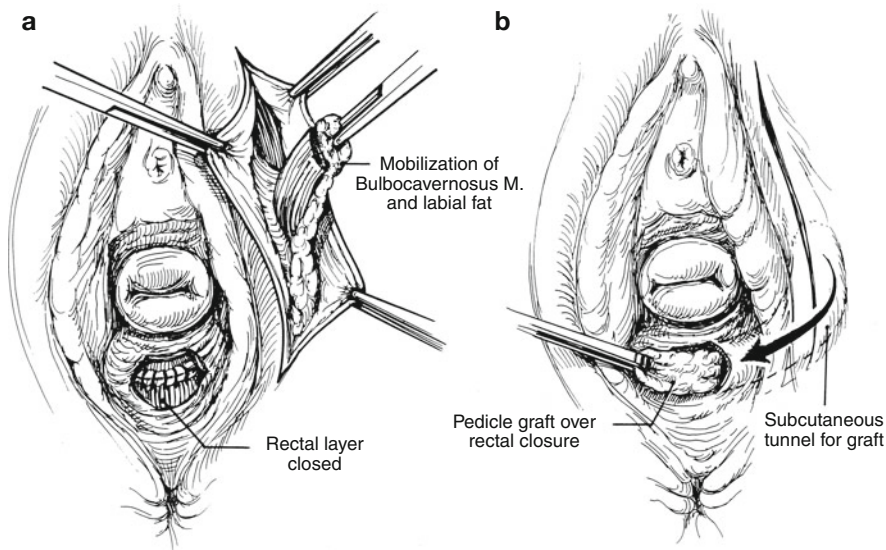
Fig. 14.3 (**a**) Martius graft: perineal dissection and mobilization of the graft. (**b**) Martius graft: interposition of the labial graft

- Use of this material is technically straightforward and avoids injury to the sphincter mechanism. Additionally the plug avoids dissection in the perineum.
- Success using either of these approaches is uncertain.
- A specially designed bioprosthetic plug specifically constructed for RVF has been used with a success rate of perhaps 30–50 %.

Muscle

- The gracilis muscle is the most commonly used muscle for interposition to obliterate a RVF.
- Success rates of 75–83 % have been reported using the gracilis, with healing less likely to occur in Crohn's disease.
- Rectus, sartorius, and gluteal muscles have been successfully used and reported in small series.
- Fecal diversion is routinely performed for muscle interposition.
- Drawbacks of this procedure are the morbidity associated with the mobilization of the pedicled muscle flap and that a more extensive perineal dissection in the rectovaginal septum is required to accommodate placement of the bulky muscle.

Bowel

- The Bricker procedure is an onlay patch of sigmoid colon.
- Through an abdominal incision, the fistula is divided and the sigmoid colon is mobilized and divided proximally.

- The distal end is looped back into the pelvis and sutured as an end of colon to side of rectum (over the fistula in the rectum) anastomosis. The proximal colon is anastomosed to the looped area in the mid-sigmoid to restore intestinal continuity. Fecal diversion is used until healing is verified with a contrast enema.

Resection

- In some instances, resection of the rectum with repair of the vagina and a low colorectal or coloanal anastomosis can be done. When possible, omentum is used to separate the vaginal defect from the new anastomosis.
- One variation described by Parks involves a sleeve coloanal technique. The rectum is mobilized and divided below the fistula. A transanal mucosectomy is done. The vagina is repaired. The healthy colon is pulled through the anus covering the fistula repair. Then a hand-sewn coloanal anastomosis is constructed along with proximal diversion.
- Technical success is reported in 78–100 % with complete continence at l year reported in one study to be 75 %.

Choice of Treatment

- Not all RVF require surgical treatment. Small fistula with minimal symptoms may only require medical management.
- Obstetrical-related fistula may spontaneously close during 6–9 months following delivery. Optimization of bowel function, most importantly controlling diarrhea may improve success.
- If the symptoms are intolerable, surgical treatment is required.
- Fibrin glue or a fistula plug are reasonable choices in low, small fistula. While their success rates are unproven, these procedures are well tolerated, carry minimal risk, and do not impede future efforts at repair.

Rectovaginal Fistulas Secondary to Obstetrical Injury

- If an obstetrical RVF does not close within 6–9 months, surgical repair is considered.
- Surrounding tissue must be soft and free of sepsis before attempting surgical repair. This may require debridement with or without a draining seton.
- Symptomatic women do not need to delay repair until after completing their childbearing, although a subsequent pregnancy after successful closure should be delivered by C section.
- An important consideration is assessment of the anal sphincters looking for a defect. In some series, 100 % of patients had a sphincter defect associated with the RVF.

- A sphincteroplasty addresses the defect and repairs the fistula simultaneously. Additionally, this technique provides excellent exposure.
- For women with an intact sphincter and obstetric-related RVF, an advancement flap or layered fistulectomy is recommended as the initial approach.
- The next step if the flap fails would be an interposition perhaps utilizing a Martius flap.
- Perineo-proctotomy or a sleeve advancement flap is considered after multiple failed repairs. Preoperative fecal diversion should be strongly considered in these complex recurrent cases.

Rectovaginal Fistulas Secondary to Cryptoglandular Disease

- These fistulas are rare.
- Local sepsis must be controlled and the patient evaluated for an occult sphincter defect.
- In the absence of a sphincter defect, an endorectal advancement flap, fibrin glue, or a fistula plug are reasonable treatments.

Rectovaginal Fistulas Secondary to Crohn's Disease

- In patients with Crohn's RVFs, control of symptoms is the primary goal vs. elimination of the fistula.
- The initial treatment is to control sepsis followed by medical management with antibiotics and immunosuppressive medication.
- Infliximab (antitumor necrosis alpha) has demonstrated efficacy in healing Crohn's RVF.
- With infliximab treatment, radiologic healing is lower than clinical healing, and long-term healing is unknown. Drainage of local sepsis and placement of a seton before starting medical treatment improves results. The seton must be removed before the completion of the infliximab course if the goal is complete healing.
- When proctitis has been controlled with medical management, surgical intervention and repair follows the same guidelines as considered for obstetrical RVF except division of sphincter muscle (perineo-proctotomy) is typically avoided. Fecal diversion in this group is controversial, but generally used.
- Most reports of healing with an advancement flap predate the introduction of infliximab and range from 30 to 92 %.
- For patients with refractory rectal disease, long-term use of a draining seton can be considered. If symptoms are still troublesome, a proctectomy and permanent stoma may be the best option.
- In a few patients with a long-term RVF, anal stricture, and active colitis, malignancy has been reported.

Rectovaginal Fistula Secondary to Malignancy

- Treatment of RVF secondary to malignancy is dictated by the treatment for the primary malignancy.
- Fecal diversion may be indicated prior to treatment for patient comfort.
- When resection with anastomosis is performed, interposition with tissue such as omentum or rectus muscle between the vagina and anastomosis may prevent postoperative fistula (especially in the face of a pelvic abscess or anastomotic leak).
- A RVF associated with squamous cell carcinoma may require diversion for symptom control during chemoradiation treatment.
- After complete resolution of the tumor if the fistula persists, repair with interposition of bulbocavernous or gracilis muscle can be considered. It is important to delay repair to allow the acute radiation effects to subside. Local repair is typically not successful in the irradiated field.

Rectovaginal Fistulas Secondary to Radiation Therapy

- A thorough evaluation for recurrent tumor is done for RVF due to radiation therapy. This may need to be carried out in the operating room with multiple biopsies.
- Fecal diversion is strongly considered to allow inflammation in the surrounding tissue to resolve.
- Decisions regarding surgical repair center on the patient's overall medical condition, the degree of symptoms from the fistula, associated abnormalities, and the risk of the proposed surgery to repair the RVF.
- Sometimes a permanent colostomy is the best choice particularly if the patient has significant fecal incontinence.
- Without interposition of healthy nonirradiated tissue into the fistula tract (gracilis muscle, Martius flap, rectus muscle, or Bricker procedure), the likelihood of successful fistula closure is low.
- Stricture or severe radiation proctitis may require proctectomy with nonirradiated colon introduced as a neorectum.

Iatrogenic Rectovaginal Fistula

- RVF after a proctectomy nearly always arise at the anastomosis. These can occur after both hand-sewn and stapled anastomosis.
- It is important to ensure that no posterior vaginal wall is trapped in the EEA stapler before firing it to perform the anastomosis.
- The first step in treatment of an RVF is to control local sepsis which may require fecal diversion and/or drainage.
- Repair depends on the location. Low fistula may be suitable for rectal or vaginal advancement flaps or a transperineal repair with interposed bioprosthetic material or muscle.

- High fistulas require repeat resection with anastomosis or interposition of omentum or muscle.
- Large fistula or those failing previous repair usually require tissue interposition.

Persistent Rectovaginal Fistula

- After an unsuccessful attempt at a repair, a repeat repair is reasonable but the success rates appear to be reduced. Therefore, subsequent options should be carefully chosen.
- It is important to tailor the surgical approach to the patient and the tissue.
- Transperineal placement of bioprosthetic material (porcine intestinal sub-mucosal biologic mesh) in recurrent RVF has been reported to have over a 70 % success rate.
- From data available, a reasonable approach for recurrent RVF involves initial conservative treatment ensuring all sepsis is drained and assessing the integrity of the anal sphincter muscles.
- For low recurrent RVF with an intact sphincter muscle and one to two previous repairs, an advancement flap or rectal sleeve advancement would be appropriate.
- Fibrin glue is a safe alternative treatment, but little data exists regarding the chance of a successful outcome in this situation.
- If there is a defect in the sphincter muscle, sphincteroplasty or perineo-proctotomy is appropriate.
- If the sphincter is intact, but there have been >2 failed repairs, interposition should be considered. The choice of technique depends on the surgeon's experience, but bulbocavernous muscle is the least morbid muscle interposition technique. There is no comparative data regarding outcomes of various interposition methods.
- Fecal diversion is not mandatory but likely increases the chance of a successful repair, especially in patients with Crohn's disease.
- Recurrent RVF located in the mid-vagina nearly always requires tissue interposition. The choice of muscle to interpose depends on the fistula level and the patient's body habitus.
- The bulbocavernous muscle may not reach a fistula in the upper/mid-vagina in an obese woman, and the gracilis is a good alternative.
- High fistulas require a transabdominal approach with resection or tissue interposition.

Conclusion

- The literature regarding RVF lacks uniform terminology, standard evaluations, and comparative studies.
- Since RVFs are diverse with multiple etiologies and varying anatomy, improving the quality of research will be challenging.