

Rectovaginal Fistula Repair Using a Porcine Dermal Graft

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BACKGROUND: Rectovaginal fistula repair is commonly performed through a vaginal route. In many cases, healthy tissue such as an autologous fat pad may be interposed between the suture lines and the vaginal epithelium to facilitate healing and prevent recurrence. We present a simple alternative to autologous flaps with the use of porcine dermal grafts in the repair of rectovaginal fistulae.

CASES: Two patients are presented with rectovaginal fistulae. In both cases the patients were found to have insufficient native tissue to achieve an adequate traditional multilayered closure, and therefore an acellular collagen porcine dermal graft was used as an interposition graft between the rectum and the vaginal epithelium in the repair.

CONCLUSION: Porcine dermal grafts may be a viable alternative to traditional autologous flaps or human dermal grafts for the repair of rectovaginal fistula (Obstet Gynecol 2004;104:1165-7. © 2004 by The American College of Obstetricians and Gynecologists.)

Despite the use of preoperative antibiotics and meticulous surgical techniques, rectovaginal fistula repair continues to be a challenge for the gynecologic or colorectal surgeon. Repair can be accomplished through the vagina, perineum, sphincter, rectum, or abdomen (with the abdomen usually the choice of approach for high fistulae). Regardless of approach, standard principles should be used to repair fistulae, including excision of the epithelialized tract, complete closure of the rectal opening with clean healthy tissue margins, adequate tissue mobilization, tension-free multilayer closure, and hemostasis.¹ Recurrent or complicated fistulae, such as those associated with irradiation, often require a more complicated operation. This may include interposing healthy tissue between layers (such as a pedicle graft from omentum, peritoneum, muscle, or fat pad) to facilitate healing. Additionally, patients found to have very poor tissue quality or lacking sufficient native tissue to accomplish an adequate multilayer repair may also benefit from the use of an interposition graft. The use of human dermal allografts in this type of repair of rectovaginal fistula has

been reported.² We report the successful repair of a rectovaginal fistula using porcine dermal graft as an interposition material in 2 patients with rectovaginal fistulae.

CASE 1

A 39-year-old multigravida presented after being informed of the presence of a possible rectovaginal fistula. She stated that she had been passing gas vaginally and having brownish/green vaginal discharge for years since the vaginal birth of her first child in southeast Asia 10 years prior. This was a vaginal delivery of a 8-lb, 8-oz child, complicated by what she recalled as being a very large vaginal laceration. Physical examination, as well as barium enema, confirmed a rectovaginal fistula, approximately 5 mm in size, 3 cm inside of vaginal introitus in the lower third of the vagina. The anal sphincter was intact, and there was no evidence of any other fistulous tracts. The patient was placed on a clear liquid diet for 24 hours before surgery, completed a sodium phosphate enema the night before surgery, and a laxative suppository the morning of surgery. Antibiotic prophylaxis was given preoperatively. The patient opted for general anesthesia and was placed in the dorsal lithotomy position, and the rectovaginal fistula was identified. A vaginal incision was made, circumscribing the fistula and ensuring healthy tissue margins around it. Vertical incisions were then made cranially and caudally in the vaginal epithelium, extending away from the circular incision and increasing access to the subepithelial plane. The vaginal epithelium was then mobilized in all directions from the underlying rectovaginal fascia. The fistulous tract was then excised all the way down through the rectum, incorporating the vaginal epithelium, fistulous tract, and rectal mucosa, as well as scar tissue surrounding the tract. Because necrotic tissue was encountered in the dissection and healthy viable tissue margins were needed, a large defect (approximately 2 cm) was left to close. A 2-layer closure of the rectum was attempted with interrupted 3/0 absorbable suture in a tension-free closure. The second layer imbricated the first and was placed in the same plane, but it was very difficult to obtain healthy tissue for the second layer because the patient was found to have very tenuous and poor quality tissue. We felt she was at high risk of breakdown of the repair. Therefore, before closing the vaginal epithelium, an acellular 3 × 3 cm porcine dermal graft was placed over the incision line and anchored laterally to the rectovaginal septum with 2/0 absorbable suture. The vaginal epithelium was then closed over the graft with interrupted 2/0 absorbable suture. The patient was discharged home in 24 hours and had an uncomplicated postoperative course. She was

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placed on a clear liquid diet for 3 days, followed by a low residue diet for 3 weeks and bowel regimen including softeners for 6 weeks. Intercourse was discouraged for 12 weeks. The patient has been followed for 18 months without recurrence of the fistula or complication from placement of the porcine graft. She has resumed sexual intercourse and reports no dyspareunia.

CASE 2

A 35-year-old woman presented with complaints of fecal incontinence approximately 3 months after a normal spontaneous vaginal delivery complicated by a third-degree laceration. Physical examination, including pelvic examination, was normal except for a 3-mm rectovaginal fistula slightly to the right of midline and 1 cm proximal to the hymenal ring. The perineal body was shortened, and rectal examination revealed decreased external anal sphincter tone. Dye instillation into the rectum excluded coexisting fistula tracts. The patient underwent uncomplicated fistula repair in a fashion similar to that described in Case 1, with concurrent external anal sphincteroplasty. An interpositional porcine dermal graft was placed after very poor tissue quality was noted during dissection. There was essentially no rectovaginal fascia found that could be used for a second-layer closure of the rectum, and attempts to go out laterally farther to the side walls would have caused significant narrowing of her introitus. Therefore, a porcine graft was placed as an additional layer for the repair and to interrupt the suture lines. She was discharged on postoperative day 1 with conservative bowel management. On postoperative follow-up, there was complete resolution of the rectovaginal fistula, with good wound healing. At the 6-month postoperative visit, the examination was normal, and the patient is without complaints of fecal incontinence or urgency. She has resumed sexual intercourse and denies dyspareunia.

COMMENT

Surgical correction of the rectovaginal fistula can be a complicated procedure, even for the advanced pelvic surgeon. Simple fistula of the mid and lower vagina are most often treated with transrectal advancement flap or transvaginal layered closure techniques and are associated with good surgical results. However, complicated or recurrent fistulae often require additional procedures, with meticulous surgical technique and tissue handling. The cause of recurrent fistulae is controversial, but suture line breakdown may be due to infection caused by contamination from stool or vaginal bacteria, not having a tension-free closure with healthy tissue margins, or

having overlying suture lines in the same direction on top of each other. Patients who are found to have very poor tissue quality or inadequate "native" tissue to achieve a multilayer closure may also be at risk of failure or recurrence. Various methods of interpositioning of healthy tissue between the suture lines to help reduce the risk of failure or recurrence have been described. The theory is that the use of a bulbocavernosus fat pad (Martius flap) or gracilis muscle flap may result in enhanced blood supply to devascularized epithelium, obliteration of dead space, and the interruption of suture lines along the length of multilayer closure. These techniques, however, involve additional surgery, advanced surgical skills, and can be associated with increased morbidity.

We have previously described the use of a cadaveric dermal allograft in the surgical repair of rectovaginal fistula as a simplified alternative to autologous interpositional flaps.² This approach minimizes the need for additional surgery, is based on common anatomical principles well known to the gynecologic surgeon, and offers the advantage of an interpositional graft between the suture lines to help prevent recurrence. This may be especially helpful in patients who are found to have poor tissue quality or an absence of healthy rectovaginal fascia to use in a multilayer closure. Compared with traditional autologous flaps, a cadaveric allograft is readily available, cost-effective, and associated with minimal complications or morbidity. Their use has also been recently described in complicated pelvic floor repairs,^{3,4} as well in augmenting rectocele repairs to help improve cure rates and achieve a more anatomical repair.⁵ A very similar anatomic technique is used when placing the graft during a fistula repair.

The use of porcine dermis in the repair of rectovaginal fistulae has not been previously reported (MEDLINE and PubMed searches with the terms "rectovaginal fistula," "dermal graft," and "allograft," for the years 1940–2004, in all languages). Pelvicol (Bard Urology, Covington, GA) porcine dermis is a natural acellular, nonallergenic matrix that has emerged as an alternative to cadaveric dermis for pelvic floor repairs. Porcine dermis offers the same advantages as cadaveric dermal grafts in repairs, as well as these additional advantages: offers an essentially unlimited supply, is easily stored (does not require refrigeration), handles very easily, has excellent strength properties, is readily incorporated into host tissue, and has decreased risk of bacteria or viral transmission. Pelvicol has been used for permanent implantation in humans since 1998. It has been used extensively in dermal grafting for burn victims and other areas of plastic, ear, nose, and throat, and general surgery. A recent report described its use in 60 different surgical procedures in 140 patients.⁶ There is limited data regard-

ing porcine graft use in gynecologic surgery, but initial studies have reported its use in anterior and posterior repair, as well as in pubovaginal slings (Graul ES, Hurst B. Porcine allograft in the repair of anterior and posterior vaginal defects [abstract]. *Int Urogynecol J Pelvic Floor Dysfunct* 2002;13 suppl:S36).^{7,8} Our initial experience with porcine dermis in prolapse repair has been encouraging, and the indications for its use continue to increase. We have found it to be an excellent material for pelvic floor repairs and have had no significant intraoperative or postoperative complications (Moore RD, Kohli N, Miklos JR. Laparoscopic uterosacral colpoperineopexy utilizing dermal graft for vaginal vault prolapse [abstract]. *Int Urogynecol J Pelvic Floor Dysfunct* 2002;13 suppl:S39).

The use of a porcine dermal graft in repair of rectovaginal fistula is a method that offers a simplified approach for placing an interpositional graft with minimal risk or morbidity, giving the surgeon the advantages of interruption of the suture lines without the extra surgical risks of bringing in an autologous tissue flap. Consideration of the use of a dermal graft in the repair of rectovaginal fistula should be given to patients who have a higher risk of failure, including patients found to have poor tissue quality that inhibits the surgeon in achieving an adequate multilayer closure. Their use should also be considered in recurrent or complicated fistulae or in a patient where a previous autologous tissue flap has failed. A porcine dermal graft should be avoided in patients known to have a hypersensitivity to porcine products or noted to have an active infection. A greater number of cases using porcine dermal grafts in rectovaginal fistula repairs is needed before these grafts can be recommended in primary repairs to reduce risk of failure or in more complicated repairs to avoid having to use

traditional autologous flaps, but initial results are encouraging.

REFERENCES

1. Wiskind AK, Thompson JD. Fecal incontinence. In: Rock JA, Thompson JD, editors. *Telinde's operative gynecology*. 9th ed. Philadelphia (PA): Lippincott Williams & Wilkins; 1997. p. 1223-36.
2. Miklos JR, Kohli N. Rectovaginal fistula repair utilizing a cadaveric dermal allograft. *Int Urogynecol J Pelvic Floor Dysfunct* 1999;10:405-6.
3. Moore RD, Miklos JR. Repair of a vaginal evisceration following colpocele utilizing an allogenic dermal graft. *Int Urogynecol J Pelvic Floor Dysfunct* 2001;12:215-7.
4. Miklos JR, Kohli N, Moore RD. Levator plasty release and reconstruction of rectovaginal septum using allogenic dermal graft. *Int Urogynecol J Pelvic Floor Dysfunct* 2002;13:44-6.
5. Kohli N, Miklos JR. Dermal augmented rectocele repair. *Int Urogynecol J Pelvic Floor Dysfunct* 2003;14:146-9.
6. Harper C. Permacol: clinical experience with a new biomaterial. *Hosp Med* 2001;62:90-5.
7. Arunkalaivanan AS, Barrington JW. Randomized trial of porcine dermal sling (Pelvicol implant) vs tension free vaginal tape (TVT) in surgical treatment of stress incontinence. *Int Urogynecol J Pelvic Floor Dysfunct* 2003;14:17-23.
8. Gomelsky A, Rudy DC, Dmochowski RR. Porcine dermis interposition graft for repair of high grade anterior compartment defects with or without concomitant pelvic organ prolapse procedures. *J Urol* 2004;171:1581-4.

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