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RECTOVAGINAL FISTULA REPAIR USING A DISPOSABLE BIOPSY PUNCH

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Abstract

Objectives—To describe a novel surgical technique for complete excision of a rectovaginal fistula tract using a disposable biopsy punch during a transvaginal rectovaginal fistula repair and present our initial surgical experience.

Methods—Description of four cases of simple rectovaginal fistulas and an innovative surgical technique for the complete excision of the fistula tract using a disposable biopsy punch.

Results—Successful three, nine and twelve month follow up of four cases with simple rectovaginal fistulas after transvaginal rectovaginal fistula repair using a novel approach for complete fistula tract excision with a disposable biopsy punch and layered non overlapping suture closure. Demographic information reported included age, parity, medical and surgical history as well as fistula characteristics including size, location, presenting symptoms and duration of symptoms. We describe our operative technique with picture description.

Conclusion—This novel approach using a disposable punch biopsy device to complete excision of simple rectovaginal fistula tracts during a transvaginal rectovaginal fistula repair can help with achieving a successful surgical outcome.

Keywords

Rectovaginal fistula; fistula tract; transvaginal repair; biopsy punch

INTRODUCTION

Rectovaginal fistulas are abnormal, epithelial-lined connections between the rectum and vagina. This condition is often profoundly bothersome to the patient and a management challenge for the physician. Rectovaginal fistulas can occur as a result of a congenital malformation, but most often have an acquired etiology. Obstetrical injury is a common cause of acquired fistulas. In a large series of 20,500 women, 0.1% developed rectovaginal fistula after vaginal delivery [1]. Although obstetric-related fistulas occur more often in underdeveloped countries, obstetric trauma such as an infected episiotomy or breakdown of a primary repair is known to occur in the United States and the rest of the developed world and can also lead to the development of rectovaginal fistulas, although these are usually of smaller size. Another common cause of rectovaginal fistula is inflammatory bowel disease,

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particularly Crohn's disease. Radcliff et al reported an incidence of 10% of rectovaginal fistula diagnosed in a cohort of 886 patients with Crohn's disease seen at one institution between 1957 and 1985 [2]. Operative trauma can also result in the formation of rectovaginal fistula after anorectal and vaginal procedures. Colorectal anastomoses may lead to fistula formation if the vaginal wall becomes incorporated during staple application or if an anastomotic leak leads to abscess that then drains into the vagina. Alternatively, pelvic procedures such as hysterectomy following radiation treatment or with unrecognized intraoperative rectal injury may also result in rectovaginal fistula development [3].

While a small subset of patients will respond to conservative management with regulating bowel function, controlling diarrhea and allowing time for spontaneous healing, most women have persistent symptomatic disease that will require surgical intervention. Factors that complicate the management of rectovaginal fistulas include surgical trauma, irradiation, pelvic inflammatory disease, multiple fistula tracts and those related to inflammatory bowel disease such as Crohn's disease or ulcerative colitis [4]. While there is no consensus in the literature or among expert opinion with regard to pre-operative management, many authorities recommend a period of 3–6 months of conservative management after fistula development in order to reduce local tissue inflammation [3]. Regardless of the timing of surgical repair, the technique chosen should depend on the type of fistula present. General principles of fistula repair include excision of the entire fistula tract followed by layered closure of non-overlapping absorbable suture lines, ensuring a tension-free and hemostatic repair [5]. One of the challenges of surgical repair is the ability to completely excise the epithelial fistula tract, which is an essential part of the repair needed to promote healing.

We describe our initial experience with the use of a disposable punch biopsy to excise the entire fistula tract during transvaginal repair of four simple rectovaginal fistulas.

CASE STUDY

Four women with rectovaginal fistulas secondary to obstetric injury, hemorrhoidectomy, and rectocele repair surgeries underwent successful transvaginal rectovaginal fistula repair using a novel approach for complete fistula tract excision using a biopsy punch and layered non-overlapping suture closure. Patient history, demographic information, and physical examination findings (including fistula size, location, symptom manifestation and duration of symptoms) are reported. The surgical approach as well as surgical outcome after repair is presented.

Case 1

The patient was a 34 year-old para 2 woman who presented for evaluation of a recurrent rectovaginal fistula. She had a fourth degree laceration after a forceps delivery of her first child 4 years prior, which was repaired at the time of delivery. She developed flatal and stool leakage per vagina one month after delivery. Evaluation revealed two fistula tracts in the midline with one 3 cm proximal and the second 5 cm proximal to the introitus. She underwent a primary transvaginal rectovaginal fistula repair with layered closure at that time. One month after this repair, she developed recurrence of the same symptoms; passing flatus and stool per vagina. She subsequently became pregnant with her second child and delivered via cesarean section.

The patient's medical history was significant for a history of irritable bowel syndrome (with recent normal colonoscopy) and anxiety.

On vaginal examination, there was no evidence of prolapse, atrophy or tenderness. There was a 3 mm rectovaginal fistula in the midline 3 cm from the introitus and above the

external anal sphincter with evidence of mucus discharge which was more prominent on rectovaginal exam. Rectal examination revealed normal tone and squeeze without hemorrhoids, fissures or masses appreciated.

Case 2

The patient was a 26 year-old para 1 woman who presented for evaluation of a 2 mm rectovaginal fistula four months after a spontaneous vaginal delivery. Her delivery was complicated by a fourth degree laceration after a midline episiotomy. She reported leakage of loose stool into the vagina. She had not been sexually active since the delivery and had been increasing dietary fiber for stool consistency.

The patient's medical history was noncontributory and she had not had previous surgeries. On vaginal examination, she was noted to have minimal anterior wall prolapse. There was a 2 mm rectovaginal fistula proximal to the external anal sphincter with no inflammation noted. Rectovaginal examination confirmed the fistula location with normal sphincter tone and squeeze. There was an obtuse anorectal angle with no hemorrhoids, fissures or masses present.

Case 3

The patient was a 66 year-old, para 1 female who presented for a second opinion regarding the possibility of a rectovaginal fistula. The patient experienced episodic passage of feces and air per vagina for a two year duration following a hemorrhoidectomy. The severity and frequency of her fecal incontinence increasingly impacted her quality of life and led to her abstinence from sexual intercourse.

Her past medical history was limited to hypertension and chronic anemia and her past relevant surgical history was notable for hemorrhoidectomy and cholecystectomy. Her obstetrical history was limited to one uncomplicated spontaneous delivery of a 7 pound infant 35 years earlier. She was married and did not smoke.

Her initial office pelvic examination revealed vulvar-vaginal atrophy with no evidence of significant pelvic organ prolapse, rectal masses, hemorrhoids, abnormal sphincter tone or recognizable fistula. However, air-distension of the rectum with the use of a sigmoidoscope and a water-filled vagina with subsequent visualization of air bubbles, revealed a 2 mm fistula orifice in the left posterior wall of the vagina approximately 2 cm superior from the introitus with no involvement of the external anal sphincter.

Case 4

The patient was a 40 year-old, para 2 female who was referred for evaluation of recurrent vaginal infections which were consistently culture-positive for fecal bacteria including *Escherichia coli*. The patient reported a history of recurrent vaginal infections following a rectocele repair in 2003, a normal colonoscopy in 2007, and multiple consultations with numerous care providers for her recurrent vaginal discharge. She denied dyschezia or other defecatory dysfunction.

Her past medical history was limited to interstitial cystitis and hypothyroidism and her past surgical history was notable for rectocele repair and cystoscopy with hydrodistension. Her obstetrical history was notable for two operative vaginal deliveries of infants weighing over 10 pounds; the second delivery was complicated by episiotomy with 4th degree laceration.

Her pelvic examination revealed normal external genitalia and introitus with midline scarring of the posterior vaginal wall with a localized focus of erythema and slight

ulceration 3 cm proximal to the hymeneal remnant. There was no obvious fistula orifice, however, air-distension of the rectum with the use of a sigmoidoscope and a water-filled vagina with subsequent visualization of air bubbles, revealed a 2 mm fistula orifice at this site. Further intraoperative assessment of the fistula tract reveals no involvement of the external anal sphincter.

Operative Technique

After a half-strength betadine enema was performed with a disposable rigid sigmoidoscope, the patient was prepped and draped in the lithotomy position. Undiluted methylene blue was used to stain the fistula tract and a local anesthetic solution was injected around the fistula tract. A lacrimal probe with a Ray-Tec® sponge on one end was placed into the rectum and up through the rectovaginal fistula tract. A 6 mm disposable biopsy punch was placed over the distal end of the lacrimal probe and brought down on the fistula, and with several turns, the entire fistula tract was excised [Figure 1]. The Ray-Tec® sponge served as a backstop for the biopsy punch to prevent injury to the rest of the rectum. The incision in the vagina from the biopsy punch was extended superiorly and inferiorly for 1 cm to improve visualization for repair. Following the excision of the fistula tract with the biopsy punch, the underlying rectovaginal connective tissue was mobilized from the vaginal epithelium. Dissection was carried out circumferentially around the clean cut edge of the excised tract and carried out laterally about 1.5–2cm away from the cut edge. The lacrimal probe and Ray-Tec® sponge were removed and replaced with a rectal probe. A layered, non-overlapping suture line closure of the full thickness rectal mucosa and rectovaginal connective tissue was completed with #3-0 absorbable polyglactin suture while the vaginal epithelium was closed with #2-0 absorbable polyglactin suture, avoiding tension on the suture lines. Rectal examination performed at the end of the procedure confirmed closure with no defect [Video]. Post operative care at our institution involves the use of stool softeners, low residue diet, Sitz bath and avoiding anything in the vagina for 6 weeks.

Given the difficulty in locating the fistula orifice for passage of the lacrimal duct probe via the rectum, a modified approach was used in Cases 3 and 4. With the patient in the dorsal lithotomy position, a saline enema was performed and a medium size Hill-Ferguson Half Moon rectal retractor was placed in the rectum to provide exposure of the rectal mucosa. As the fistula orifice could not be visualized transrectally, a lacrimal duct was placed via the transvaginal approach and guided through the tortuous tract until its tip could be directly visualized rectally. The winged-flanges of the lacrimal duct probe were crimped so as to allow a 6 mm disposable punch biopsy to be passed over the distal end of the lacrimal probe from a vaginal approach to core out the entire fistula tract while the Hill-Ferguson rectal retractor provided exposure and minimized risk of inadvertent injury to other portions of the rectal wall. Once the tract was cored-out and completely resected, a finger in the rectum provided ventral deflection of the rectal wall so as to expose the rectal mucosa and muscularis as well as the rectovaginal connective tissue and vaginal epithelium which were sequentially sutured with absorbable polyglactin suture for a layered closure.

DISCUSSION

We describe our technique for complete excision of small rectovaginal fistula tracts with clean, clear cut margins using a disposable Integra-Miltex™ biopsy punch (Integra, York PA) during transvaginal simple rectovaginal fistula repair in four cases. Post operative follow up evaluation at three, nine and 12 months revealed complete resolution of the fistulas and subjective satisfaction in all four patients.

Many different surgical approaches have been described for management of rectovaginal fistula. Most of these surgical approaches are classified as local (transvaginal, transanal or

transperineal) or abdominal/laparoscopic. These approaches are determined by the etiology, location, and size of the fistula, as well as the quality of surrounding tissue, and previous attempted repairs [6]. The repair of low rectovaginal fistulas communicating with the rectum at or above the dentate line as well as the middle rectovaginal fistula found in the middle one third of the vagina are usually achieved by a local transvaginal or transperineal approach to repair. High rectovaginal fistulas with vaginal communication close to the cervix or vaginal cuff are generally repaired using an abdominal approach as they may have communication with the sigmoid colon thus requiring bowel resection of the involved segment and bowel re-anastomosis. Transvaginal approach to simple rectovaginal fistula repair has been well described in the literature [4]. The timing of the surgical repair of rectovaginal fistula is felt to be important in order to improve the outcome of surgery, by allowing for the resolution of inflammation and infection. Other fundamental principles of successful rectovaginal fistula repair include complete excision of the epithelial fistula tract and tension-free non-overlapping suture lines with a multiple, layered closure. To provide the best chance of successful repair, healthy, well-vascularized tissue needs to be reapproximated after resection of the epithelial or scar tissue. Therefore, the surgeon must adequately excise the fistula tract and areas of inflammation or scar tissue prior to closure [7]. Sharp dissection using a scalpel or scissors is often utilized for this excision. This technique can result in a fragmented tissue specimen, and sometimes residual epithelial tissue is left behind, which may jeopardize the success of closure and result in recurrence of the fistula tract. The use of the biopsy punch provided a clean circumferentially-excised tract for pathology evaluation.

In our cases, all four patients had simple, small (2 mm and 3 mm) and low fistulas without the involvement of the external anal sphincter, thus allowing for a transvaginal approach to repair with layered closure. Certainly the small size of the fistulas in our cases was an important factor in our ability to use the disposable punch biopsy for excision of the epithelial tracts. The largest diameter available for this particular biopsy punch is 8 mm. Thus, the use of this device for larger fistula tracts may not be feasible. Although all the fistulas in our case series had a direct pathway, a tangentially oriented fistula tract may pose a unique challenge. While the lacrimal probe could act as a guide for the punch biopsy as the tract is being excised, there may be potential for sub-optimal fistula tract excision in this scenario. In addition, with a tangentially oriented fistula, the vaginal incision over the fistula tract can be further extended to ensure a complete and adequate layered closure incorporating the extent of the fistula.

Our surgical technique for the excision of rectovaginal fistula tract was described here with simple, low or middle rectovaginal fistulas without external anal sphincter involvement. This approach may not be appropriate for high fistulas or anovaginal fistula with an opening below the dentate line. Although fistulas due to etiologies such as radiation therapy, malignancy, or active inflammatory bowel disease are more difficult to treat successfully, the general surgical principles for repair still hold true for these fistulas. Consideration should be given to interpositioning of vascular flaps such as a Martius bulbocavernosus fat pad graft in fistulas associated with radiation therapy or with recurrent fistulas due to poor tissue vascularity. A sphincteroplasty can be performed to correct a sphincter defect and interpose bulky muscle in the rectovaginal septum and perineum when dealing with rectovaginal fistulas with sphincter involvement in patients with fecal incontinence as a result of the defect in the sphincter mechanism [6].

In conclusion, the ability to completely excise the fistula tract during rectovaginal fistula repair is paramount to the successful surgical outcome. While this may present a challenge to the surgeon during transvaginal repair of simple rectovaginal fistula without external anal sphincter involvement, the use of a disposable biopsy punch guided by a lacrimal probe can

assist with the complete excision of fistula tract with a clean cut margin with subsequent tension-free layered closure.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Fig 1.
Fig.1a,b,c,d – 6mm disposable biopsy punch placed over lacrimal probe with complete excision of fistula tract.