

Gracilis Transposition for Rectovaginal Fistulae

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Abstract

Background: Rectovaginal fistula (RVF) is a distressing condition for patients and for physicians who are continuously challenged in providing durable treatment options. This study was designed to assess the efficacy of gracilis muscle transposition in the treatment of rectovaginal fistulas.

Methods: Retrospective study of patients who underwent gracilis muscle transposition for fistula between rectum and vagina from May 2006 to March 2016. This study shows the experience of patients with fecal incontinence treated with gracilis muscle transposition. All patients had fecal diversion. Follow-up data were gathered from outpatient clinic visits. Successful repair was defined as a healed fistula after stoma closure.

Results: We performed ten gracilis muscle transposition flaps with fistulas between the rectum and the vagina. Two of those patients had associated fecal incontinence during the eight years study period. The patients mean age was 37.4 years, \pm 14.9, (range 21 - 62). The etiologies were six obstetric tears (60%), three were by traumatism (30%) and one (10%) had undergone a proctocolectomy with vaginal pouch-vaginal. The most common indication for surgical repair was on seven patients, undergone previous vaginal repair (70%), two patients (20%) endorectal advancement flap and one patient (10%) fistula plug insertion. Two patients (20%) have not previous surgery. Two (20%) patients had sphincter defects associated con fecal incontinence. There were no intraoperative complications. Early minor postoperative complications occurred in 10 patients with 10 abscess wound (100%). There were no long-term sequelae.

Conclusions: Gracilis muscle transposition is a viable option to repair fistulas between the vagina and the rectum, especially after failed perineal or transanal repairs. It is associated with low complications and a high success rate. In addition, graciloplasty can reconstruct the perineal defect in patients with fecal incontinence.

Keywords: Gracilis Muscle; Graciloplasty; Rectovaginal Fistula; Fecal Incontinence

Introduction

Rectovaginal fistula (RVF) is a pathological sinus tracts defined as an epithelium-lined abnormal communication between rectum and vagina cavity that leads to passage of rectal contents (gas, liquid or solid stool, and inflammatory pus) through the vagina, thereby producing a distressing medical, condition considerable social, psychological and sexual dysfunction, burden that, increases with the diameter of the fistula [1]. The exact incidence of RVF is not known. It is reported to represent approximately 5% of all anorectal fistulas

[2,3]. The United Nations estimates that two million women live with an obstetric fistula and that 50,000 - 100,000 new cases occur every year [4]. Most (RVF) are caused by obstetric trauma (postpartum rectovaginal fistula 88%). The total number of cases corresponds to 0.1% of all vagina births [5]. The reported frequency of RVFs following low anterior rectal resection reached 10% [6-9]. These etiologies include the result trauma inflicted by violent acts or foreign bodies as well as trauma during obstetric, gynecologic, or colorectal surgeries, Crohn's disease, mucosal ulcerative colitis, pelvic neoplasia (cervix, rectum, vagina, or leukemia) [10,11], infection (cryptoglandular or diverticular abscess). To the formation of RVF contribute history of pelvic irradiation, neoplasia (restorative proctectomy) [12-14]. Alleviated by fecal diversion, these fistulas seldom heal spontaneously [15]. In recent years, rectovaginal fistula has been an increasingly common complication following hemorrhoid or pelvic floor surgery, particularly in cases where staplers or foreign materials were used [16-20]. Most patients with rectovaginal fistulas require surgical treatment. Numerous surgical procedures have been described for the treatment of rectovaginal fistulas, but none has been universally accepted as the procedure of choice. Among the procedure are fecal diversion, primary repairs [21] endorectal advancement flap, coloanal sleeve anastomosis [20], transposition flaps (omental), and various muscle flaps: bulbo cavernosus, rectus abdominis, gracilis [20,21], none of which has gained wide acceptance as the procedure of choice. The diversity in treatment methods, combined with the limited reported success rates, attests to the complexity of this difficult condition. RVF are complex fistulas that pose significant surgical difficulty. The techniques available vary based on surgeon expertise and patient tissue viability. The aim of this study was to review our experience with gracilis muscle transposition to assess its efficacy on the surgical treatment of rectovaginal fistula in patients with fecal incontinence secondary to vaginal trauma.

Materials and Methods

We performed a retrospective study of all patients who underwent gracilis muscle transposition flap in our institution from May 2006 to March 2016, in order to repair the fistulas between the rectum and vagina arising from diverse etiologies. The RVF in patients were associated with fecal incontinence secondary to vaginal trauma. The patients with fecal incontinence were asked the Wexner score, as was described by Jorge and Wexner [22]. The patients data obtained included demographic, clinical, and operative data collected from the patients' medical charts, such as age, comorbid conditions (diabetes or cardiac disorders). The fistula characteristics analyzed data included etiology, history of prior surgical repairs, type of prior repairs, need for fecal diversion with a stoma, duration of fistula symptoms, and fistula dimensions. These patients failed previous repair attempts or had a history of pelvic irradiation. Follow-up data were gathered from outpatient clinic visits. All patients received preoperative physical examination. Data regarding patient's follow-up were obtained from the last office visit. The gracilis muscle can be taken from either the left or right thigh, however we preferred to use the left one. Statistical analysis was performed using the computer statistical package Instat (1993). A p value of < 0.05 was considered statically significant.

Surgical Technique

The use of a muscle transplant was first described by Byron., *et al.* in 1969 [24], for the repair of radiation-induced recurrent rectovaginal fistulas. Corman., *et al.* [26] first describe the management of fecal incontinence by gracilis muscle transposition. Preoperatively, all patients had establishment of fecal diversion colostomy, before (as part of previous operations or repair attempts) or at the time of the transposition procedure. The technique of gracilis muscle transposition for the repair of rectourethral fistula has been previously described by [28]. Three inner longitudinal skin incisions of 3 to 5 cm were made along the medial part of the thigh (Figure 1A), and the gracilis muscle was released from its tibial insertion (Figure 1B, 2, 3).



Figure 1A: The thigh skin incisions (from Zmora., *et al.* 2003).

Before skin closure, a small suction drain is placed in the perineal wound and the thigh incisions are closed. All patients received postoperatively antibiotics within 6 days after surgical procedure. All patients were under general anesthesia, and operated on either in the lithotomy position.



Figure 1B: Gracilis muscle mobilization (photo of first author).

After 8 weeks follow-up period the thigh and vaginal incisions were well healed. The success of graciloplasty was defined as closure of the fistula with no recurrence and was determined by the patient's feeling of absence of air trapping or vaginal secretion, which is a highly sensitive marker in the case of recurrent fistulas.



Figure 2: Incision is made between the anus and vagina.

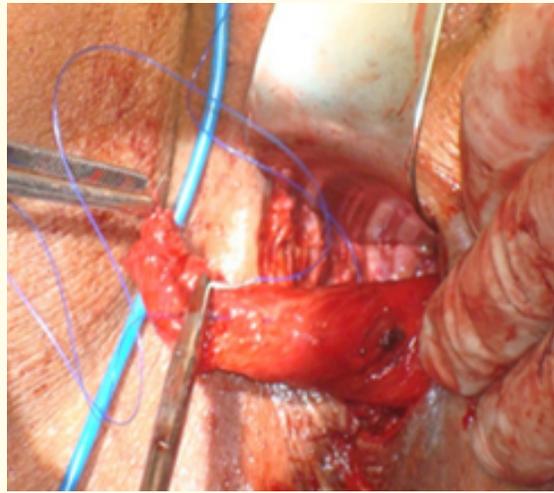


Figure 3: The muscle is then secured to the apex of the dissection to hold the muscle in place (photo of first author).

Fistula closure was tested in every patient by clinical examination including rectoscopy, air insufflation, and gynecologic examination with methylene blue and not leaks to vagina was detected. Examination revealed no recurrence and the colostomy was then closed.

Results

We performed ten gracilis muscle transposition flaps with fistulas between the rectum and the vagina, of which two patients had associated fecal incontinence during a study period of eight years. Patients mean age was 37.4 years, \pm 14.9, range 21 - 62. The etiologies were six obstetric tear (60%), three were by traumatic (30%) and one patient who had undergone a proctocolectomy with pouch-vaginal (10%). The indication for surgical repair were: seven patients undergone previous vaginal repair (70%), two patients endorectal advancement flap (20%), one patient was fistula plug insertion (10%), two patients haven't previous surgery, two patients had sphincter defects associated with fecal incontinence (Figure 4). The patients with fecal incontinence reported improved Wexner incontinence score after the procedure (18/3 points), with a significantly improved quality of lifestyle 1 year after treatment. Operation time varied from 180 - 300 minutes (237 ± 36). The left gracilis was used in nine patients. One patient was used right leg because lower limbs varices. The median follow-up time was 19 (range 8 - 24) months. The mean fistula duration time was 6 months (range 3 - 12 months). The mean time of stoma closure was 7.6 months (range 4 - 14 months) after graciloplasty. The mean days stay at hospital was 5 (range 4 - 6 days) There were no intraoperative complications except for moderate blood loss in two cases. Early minor postoperative complications occurred in 10 patients (100%), 10 abscess wound (100%), five patients with wound dehiscence partial a little bleeding (50%), two patient had medical complication lower limb pain (20%) and in the colostomy closure site in two patients (20%). There were no long-term sequelae. An additional positive effect of the graciloplasty was the reconstruction of the perineum which is usually traumatized, and of scar tissue with a vascularized muscle.

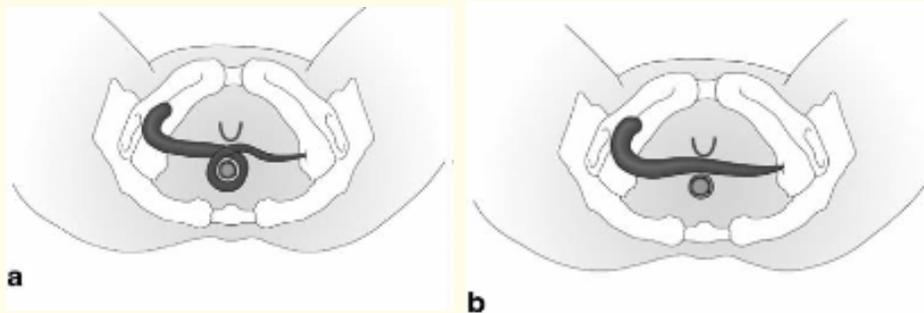


Figure 4: Transposition of the gracilis muscle in (a) neosphincter or (b) single plastic position (Taken from Fürst., et al).

Discussion

Rectovaginal fistulas (RVF) are a distressing medical condition in women of any age. Treatment requires an experienced surgeon and the application of an appropriately chosen technique. Various surgical procedures have been suggested to repair the fistula [13-15]. The gracilis muscle is one of five adductor muscles of the thigh and is well suited to repair RVF due to the proximity of its vascular pedicle to the perineum, its adequate length and minimal functional donor-site morbidity [27]. The etiology of the fistula, duration of its presence, choice of operative procedure, health of surrounding tissues, presence of a diverting stoma are suspected factors that may contribute to operative outcomes. Obstetric injury is the most common cause of RVF described in the literature [1-9]. The present study identified obstetric trauma as the main cause of RVF (60%). This fact is not surprising given the large referral base for obstetric trauma seen in our institution perhaps due to the great number of patients referred at colorectal surgery service. Inflammatory bowel disease (mucosal ulcerative colitis), is another contributing cause to rectovaginal fistula with rates between 6% and 23% [16-18]. The present study identified ulcerative colitis in one patient (10%). In this study we performed graciloplasty in eight patients. We observed a closure of RVF in all patients in a mean follow up period of 3.4 years, no recurrence of fistula was observed. Sonoda., *et al.* reported successful repairs in 43.2% of 37 patients who underwent the endorectal advancement flap to treat RVF of varying etiologies. In this study endorectal advancement flap was used in one patient (10%), with recurrence of fistulae after surgery [31]. Fürst., *et al.* described 12 patients who received gracilis flaps for RVF treatment, and only one patient had fistula recurrence [32]. In our study no recurrence occurred since all patients had healed fistula. Wexner., *et al.* reported 17 patients who underwent RVF [15] or pouch vaginal fistula [2] repair. Two patients had a second gracilis flap placed: one due to flap necrosis at the time of first procedure, and the other due to a persistent anoperineal tract. Complications included thigh pain and infection [33]. Lefevre., *et al.* [34] described eight patients who had gracilis flap repair for rectovaginal fistula. Six were successful. Two of the eight patients had perineal wound infection. In our study all patients had perineal wound infection. Complications included lower limb pain, wound infection, delayed healing wound perineal. Long-term complications were not reported. Ulrich., *et al.* [35] reported successful outcomes in seven of nine patients. Nassar reported (100%) success in 11 patients using a gracilis flap [36]. The largest case series of patients in whom gracilis flaps were used to repair RVF comprised 24 patients, with a 79.2% success rate at a median follow-up of 28 months [10]. Specific complications pertaining to gracilis muscle use are not reported in that study. A systematic review published in 2014 found an overall success rate of 73% (range 0 - 100%) when using gracilis muscle transposition for complex perineal fistula, including RVF and reported a complication rate ranging from (0 - 49%) [7]. Many authors have analyzed the influence of different factors, such as sex, previous operations, the presence of a diverting stoma or Crohn's disease on the healing rate of RVF [6,15,17,19,22,24,25,37]. Table 1, summarizes the latest published success rates of RVF repairs.

Author	Year	No	Stoma	Stoma reversal	Success after/reversal	Mean/media age	F/U month
Torres	2016	10	10	10	10 (100%)	37.4 (21 - 62)	19 (8 - 24)
Maeda	2011	18	18			33 (17 - 59)	64 (25 - 123)
Nassar	2011	11	11	11	11(100%)	33 (17 - 59)	64 (25 - 123)
Lefevre	2009	8	7	5	5 (100%)	39 (26 - 63)	28 (4 - 55)
Ulrich	2009	35	35	35	33 (94%)	58 (38 - 78)	28 (6 - 60)
Wexner	2008	53	37			58.6 (16 - 81)	3
Furst	2007	12	12	11	11 (100%)	38 (24 - 47)	40.8
Schaden	2007	5				40.4 (33 - 51)	19.6 (12 - 43)
Oomen	2007	7					
Zmora	2006	9	9	7	7 (100%)	46.4 (30 - 64)	26 (9 - 74)
Rabau	2006	10	10	8	8 (100%)		26

Table 1: Success rates for RVF by gracilis muscle transposition.

Conclusions

The gracilis muscle transposition technique has a high success rate in the repair of fistulas between the rectum and vagina arising from various etiologies. It is effective after failed previous repairs, given the high success rate and low complication rate. Gracilis transposition in the treatment of recurrent RVF for trauma pelvic, had excellent short-term results in our series. In addition, graciloplasty can successfully reconstruct a perineal defect and previous repairs and is a useful and effective method for the treatment of RVF, is associated with low complication and high success, effective secondary in patient with fecal incontinence.

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