



Original Research Article

Successful repair of the rectovaginal fistula with gracilis muscle interposition

Pradeep Kumar Singh^{1,*}, Manoj Kumar Johar¹, Vishal Kumar Biswkarma¹¹Dept. of Plastic Surgery, Max Super Speciality Hospital, Patparganj, New Delhi, India

ARTICLE INFO

Article history:

Received 07-10-2019

Accepted 12-11-2019

Available online 06-12-2019

Keywords:

Rectovaginal fistula

Gracilis muscle

Interposition.

ABSTRACT

Introduction: Rectovaginal fistulas represent an often devastating condition in patients and a challenge for surgeons. Successful management of this condition must take into account a variety of variables including the etiology, size, and location of the fistula. We retrospectively evaluated our experience with the gracilis interposition procedure to assess its efficacy in repairing rectovaginal fistulas.

Materials and Methods: We performed a retrospective study of all patients who underwent gracilis muscle interposition flap in our institution from January 2015 to November 2018 for the repair of fistulas between the rectum and vagina arising from diverse etiologies.

Results: Rectovaginal fistula repair with gracilis muscle interposition was done in twelve patients. The etiologies were obstetric trauma (n=7), trauma (n=3), post arteriovenous malformation excision (n=1) and one patient had fistula after excision of squamous papilloma of rectum. Overall all the patients with gracilis interposition flap resulted in complete healing, a success rate of 100 percent.

Discussion: Various surgical procedures have been suggested for the repair of these fistulas, including fecal diversion, primary repair, endorectal advancement flap, transvaginal repair, coloanal sleeve anastomosis, and interposition flaps. The reported success rate for the repair of rectovaginal or rectourethral fistulas using the gracilis muscle interposition technique is generally much higher than that reported for other repair techniques.

Conclusion: Given the high success rate and low complication rate, repair with gracilis muscle interposition is recommended for fistulas with unfavorable local conditions, such as those present after radiation or subsequent to long-term, persistent infection, and especially after failed previous repairs.

© 2019 Published by Innovative Publication. This is an open access article under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by/4.0/>)

1. Introduction

Rectovaginal fistulas (RVF) symbolize a repeatedly scandalous situation in patients and a dispute condition for a general practitioner. Flourishing care must consider a number of reasons like etiology, site, and size of the fistula. Moreover, the condition of the included tissues and overall health condition of the patient are considerable aspects. These fistulas can arise due to a number of reasons like obstetrical trauma, carcinoma, diverticulitis, and infectious procedure, radiotherapy, chronic infection of the gastrointestinal tract, and as an outcome of post-surgical process. The widespread cause of RVF is obstetrical

distress. Several factors contribute to this such as extended obstructed labor may produce damage to multiple organ frameworks. Out of these, the well known and ordinary injury is obstetric fistula formation. At the point when obstructed labor is unrelieved, the showing fetal part is affected beside the soft tissues of the pelvis and an extensive ischemic vascular damage develops that leads to tissue necrosis and consequent fistula development. Other inclining variables comprise midline episiotomy, forceps delivery, midline episiotomy, and 3rd or 4th -degree perineal laceration.¹⁻⁵ In a study reported by Goldabar et al, there is 1.7% incidence of 4th - degree lacerations and 0.5% RVF in a sequence of 24,000 vaginal deliveries.⁶

The second most frequent cause of RVF is a chronic infection of the gastrointestinal tract, specifically Crohn's

* Corresponding author.

E-mail address: drpradeepkr.singh@yahoo.co.in (P. Kumar Singh).

disease (reported in 10% of patients). In a finding by Radcliffe et al, a 9.8% incidence rate of RVF was reported due to Crohn's disease.⁷ In a similar study by Schwartz et al (2000), the incidence rate was 9%.⁸

Threatening procedures, including malignancies of the uterus, rectum, cervix, or vagina, can likewise add to the nearness of RVF. Furthermore, fistulas can develop as an impediment of radiotherapy and postsurgical measures included low anterior resection with stapled hysterectomy, rectocele repair, anastomosis, and recuperative proctocolectomy amid ileal pouch anastomosis.

A number of operative modalities have been depicted for the management of fistulas in between the vagina or urethra and rectum, but none has been globally accepted as the modus operandi of preference. The choices are dictated by the etiology of the fistula, area, size, nature of the encompassing tissue, and recently endeavored modalities. Some of them are fecal distraction, primary repairs,⁹ endorectal improvement flap,¹⁰ coloanal sleeve anastomosis,¹¹ transposition flaps (e.g., omental), and different muscle flaps: Bulbocavernosus, rectus abdominis, Sartorius, Gluteus, and Gracilis.¹²⁻¹⁴

We reported our experience over retrospectively operated with the gracilis interposition and assessed for its efficacy in repairing RVF.

2. Materials and Methods

A retrospective study was performed of patients who underwent GMI flap for the repair of fistulas in our department between January 2015 to November 2018. Patient demographics, clinical and operative data were collected from the patient's history, discharge summary available in hospital database. The follow-up data were collected from the outpatient clinic visit. A total of 12 patients were operated with average age of 35.8 years (range 22-65 years) for RVF and GMI for fistula repair.

2.1. Surgical technique

The patients who underwent fistulas repair were represented signified fecal diversion, colostomy at same time or before repair with GMI. A transverse skin opening was made at the perineal body followed by dissection of the rectovaginal septum in the surgical procedure. Subsequently, by excising fistula tract the dissection of rectovaginal septum was continued at the level of 3 cm cephalic. We closed primarily to opening in the vagina and rectum and made two longitudinal skin cuts next to the medial portion of thigh to free the Gracilis muscle from its tibial insertion.¹⁴ After that it was removed while taking care of the neurovascular pedicle. We brought the muscle to its end by rotating through a subcutaneous channel to the perineal region. It was kept in consideration that vagina and rectum preset at least 3 cm over the fistula position. The patients

who represented repaired fistula were operated 3 months postoperatively for stoma closing under evaluation of anesthesia. The patients demonstrating repaired fistula was measured as success rate percentage.

3. Results

RVF repair with GMI was done in 12 patients during this time period. The etiologies were obstetric trauma (n=7), trauma (n=3), post arteriovenous malformation excision (n=1) and one patient had fistula after excision of squamous papilloma of the rectum. Out of these seven patients with obstetric trauma, three patients had prolonged labor while two patients had midline episiotomy and two patients had trauma during forceps delivery. Out of the total, six patients had already operated for fistula and four of them operated for multiple procedures (Table 1). Seven patients were operated for right gracilis muscle. The average follow-up duration was 11 months (ranging from 1-18 months) after stoma closure. In general, complete healing was observed in all the patients with GMI flap. There was no intraoperative risk in any of the patients. However, some discomfort includes mild infection in the perineal lesion in 2 patients which recovered after subsequent 2-3 dressing. There were no long term sequelae.



Fig. 1: 30 yr old female presented to us with recto-vaginal fistula following episiotomy during child birth. Before going for the surgery for fistula, diversion colostomy was done

4. Discussion

RVF is generally devastating condition and restricted by repeated repair of fistulas. A number of operative methods have been recommended for the repair of these fistulas including primary repair, transvaginal repair, fecal diversion, endorectal advancement flap,¹⁵ coloanal sleeve anastomosis, and interposition flaps. Numerous factors have been reported which affect the fistula repair. An



Fig. 2: Per-operative picture showing elevated gracilis muscle after excision of fistula and repair of rectum



Fig. 3: After gracilis muscle interposition and repair of vaginal opening



Fig. 4: Immediate post-operative picture



Fig. 5: 5 month post-operative picture of the patient after closure of the diversion colostomy and healed fistula

Table 1: Clinical and operative characteristics

Mean age (years)	35.8 (range 22-65)
Etiology	
Obstetric injury	7
Trauma	3
Post AV malformation excision	1
Squamous papilloma of rectum excision	1
Previous repair attempts	6
Operative data	
Right gracilis	7
Left gracilis	5
Mean follow-up (months)	11 (range 1-18)
Complete healing	100%

inside opening higher than 2 cm from the dentate line, an existing together dynamic rectal Crohn's disease, and tireless or undrained sepsis in the rectovaginal septum have been embroiled as components related with poor diagnosis and mitigation of rectovaginal fistulas.¹⁶ In instances of irradiated rectovaginal or rectourethral septum, damaged tissue, or interminable sepsis that leads to a similar consequence of a thin, fibrotic perineal body and septum, regularly is deficient suitable tissue for any local repair to

secure fistulas. In these conditions, it is basic to isolate the organs and mediate healthy tissue with a free blood supply.¹⁷ The gracilis muscle is an amazing pedicled fold since it is effectively prepared and has an adequate size. The gracilis muscle had been recently depicted for healing of interminable unhealed perineal injuries after proctectomy in patients with Crohn's disease, with a repair rate shifting from 60-100% in various succession.¹⁸ It has additionally been utilized for making a neosphincter.^{13,19}

The closing of RVF utilizing the GMI procedure is commonly favored than that recommended for other repair strategies. According to Rius et al, there is a repair rate of 60% in a progression of 4 patients with Crohn's disease and rectovaginal, rectourethral, and pocket vaginal fistulas.¹⁶ Zmora et al. portrayed a progression of 11 males with iatrogenic rectourethral fistulas after medical procedure or pelvic radiotherapy of prostate cancer.²⁰ A total of 83% of 12 interposition flaps brought about complete mending, despite the fact that in 2 cases further surgeries were required, with inevitable complete recuperating. Different groups reported to a 100% success rate with GMI of persevering complex RVF that unable to previous flap repairs, rectourethral fistulas, and for pocket vaginal fistulas in gut infection patients after restorative proctocolectomy. It was effectively applied for the repair of urethroperineal, vesicovaginal, iatrogenic prostate rectal fistulas, and for different fistulas in pediatric patients.²¹⁻²³

This investigation comprised of a heterogeneous patient populace with fistulas emerging from assorted etiologies. We observed complete repair of post-operative RVF. Just two patients had persevered vaginal release after the closing which was recovered after rehashed dressings with no proof of reappearance of fistula.

The significant specialized highlights of the GMI are fecal preoccupation, meticulous homeostasis, tension-free primary repair of the rectum after dissection and assembly to a level of 3 cm over the fistula site, and a suitable, strain-free, well-vascularized muscle pedicle.

5. Conclusion

The GMI is the most precedence and reliable procedure for the repair of RVF emerging from different etiologies. It was found to be the procedure with high success rate and least associated risk. The procedure should be recommended for complex and complicated wound condition, for example, those present after radiation or consequent to long duration, relentless disease, and particularly after previously unsuccessful repairs.

6. Source of funding

None.

7. Conflict of interest

None.

References

- Fenner DE, Genberg B, Brahma P, Marek L, Delancey J, Rogers R. Fecal and urinary incontinence after vaginal delivery with anal sphincter disruption in an obstetrics unit in the United States. *Am J Obstet Gynecol.* 2003;189(6):1543-1549.
- Signorello LB, Harlow BL, Chekos AK, Repke JT. Midline episiotomy and anal incontinence: Retrospective cohort study. *Br Med J.* 2000;320(7227):86-90.
- Christianson LM, Bovbjerg VE, Mcdavitt EC, Hullfish KL. Risk factors for perineal injury during delivery. *Am J Obstet Gynecol.* 2003;189(1):255-260.
- Hudelist G, Gellen J, Singer C, Ruecklinger E, Czerwenka K, Kandolf O. Factors predicting severe perineal trauma during childbirth: Role of forceps delivery routinely combined with mediolateral episiotomy. *Am J Obstet Gynecol.* 2005;192(3):875-881.
- Venkatesh KS, Ramanujam PS, Larson DM, Haywood MA. Anorectal complications of vaginal delivery. *Dis Colon Rectum.* 1989;32(12):1039-1041.
- Goldaber KG, Wendel PJ, McIntire DD, Wendel GD. Postpartum perineal morbidity after fourth-degree perineal repair. *Am J Obstet Gynecol.* 1993;168(2):489-493. Available from: [10.1016/0002-9378\(93\)90478-2](https://doi.org/10.1016/0002-9378(93)90478-2).
- Radcliffe AG, Ritchie JK, Hawley PR, Lennard-Jones JE, Northover J. Anovaginal and rectovaginal fistulas in Crohns disease. *Dis Colon Rectum.* 1988;31(2):94-99.
- Schwartz, Da, Loftus EV, Tremaine WJ, Panaccione R, et al. The natural history of fistulizing Crohns disease in Olmsted County. *Minnesota Gastroenterology.* 2002;122(4):875-880.
- Hudson CN. Acquired fistulae between the intestine and the vagina. *Ann R Coll Surg Engl.* 1970;46(1):20-40.
- Rothenberger DA, Christenson CE, Balcos EG, Schottler JL, Nemer FD, Nivatvongs S. Endorectal advancement flap for treatment of simple rectovaginal fistula. *Dis Colon Rectum.* 1982;25(4):297-300.
- Macrae HM, Mcleod RS, Cohen Z, Stern H, Reznick R. Treatment of rectovaginal fistulas that has failed previous repair attempts. *Dis Colon Rectum.* 1995;38(9):921-925.
- Stirnemann H. Treatment of recurrent recto-vaginal fistula by interposition of a gluteus maximus muscle flap. *Am J Proctol.* 1969;p. 52-54.
- Byron RL, Ostergard DR. Sartorius muscle interposition for the treatment of the radiation-induced vaginal fistula. *Am J Obstet Gynecol.* 1969;104(1):104-107. Available from: [10.1016/S0002-9378\(16\)34147-3](https://doi.org/10.1016/S0002-9378(16)34147-3).
- Ryan JA, Beebe HG, Gibbons RP. Gracilis muscle flap for closure of rectourethral fistula. *J Urol.* 1979;122(1):124-125. Available from: [10.1016/S0022-5347\(17\)56282-5](https://doi.org/10.1016/S0022-5347(17)56282-5).
- Sher ME, Bauer JJ, Gelernt I. Surgical repair of rectovaginal fistulas in patients with Crohns disease: Transvaginal approach. *Dis Colon Rectum.* 1991;34(8):641-648.
- Rius J, Nessim A, Noguerras JJ, Wexner SD. Gracilis transposition in complicated perianal fistula and unhealed perineal wounds in Crohns disease. *Eur J Surg.* 2000;166(3):218-222.
- Boronow RC. Repair of the radiation-induced vaginal fistula utilizing the martius technique. *World J Surg.* 1986;10(2):237-248.
- Ryan JA. Gracilis muscle flap for the persistent perineal sinus of inflammatory bowel disease. *Am J Surg.* 1984;148(1):64-70.
- Wexner SD, Gonzalez-Padron A, Teoh TA, Moon HK. The stimulated gracilis neosphincter for fecal incontinence: A new use for an old concept. *Plastic Reconstructive Surg.* 1996;98:693-699.
- Zmora O, Potenti FM, Wexner SD, Pikarsky AJ, Efron JE, Noguerras JJ. Gracilis Muscle Transposition for Iatrogenic Rectourethral Fistula. *Ann Surg.* 2003;237(4):483-487.
- Mowlem A. Use of the gracilis muscle in the repair of a urethroperineal and a vesicoperineal fistula after removal of the rectum. *Surg.* 20:340-343.

22. Dez AB, Castelo LA, Rosado LF, Jorge AA, Moldes MR, et al. Fstula prostaticorectal yatrognica. Reparacin con colgajo pediculado de msculo gracilis. *Actas Urol Esp [Internet]*. 2004;28(6):466–471. Available from: [10.1016/S0210-4806\(04\)73113-7](https://doi.org/10.1016/S0210-4806(04)73113-7).
23. Hecker WC, Holschneider AM, Kraeft H. Surgical closing of recto-vaginal, recto-urethral, urethro-vaginal and vesico-cutaneous fistulas by means of interposition of the gracilis muscle. vol. 51. and others, editor. *Zeitschrift fur alle Gebiete der operativen Medizin: Der Chirurg* ; 1980,.

Author biography

Pradeep Kumar Singh Senior Consultant

Manoj Kumar Johar Director and Head

Vishal Kumar Biswkarma Research Scholar

Cite this article: Kumar Singh P, Kumar Johar M, Kumar Biswkarma V. Successful repair of the rectovaginal fistula with gracilis muscle interposition. *Indian J Obstet Gynecol Res* 2019;6(4):527-531.