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Recommended Citation

Soliman, Hossam H. and Boghdady, Mohamed A. (2020) "Martius graft transposition: a successful procedure for the ultimate repair of the anovaginal/rectovaginal fistula," *Journal of Medicine in Scientific Research*: Vol. 3: Iss. 1, Article 10.

DOI: https://doi.org/10.4103/JMISR.JMISR_62_19

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Martius graft transposition: a successful procedure for the ultimate repair of the anovaginal/rectovaginal fistula

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Abstract

Background

Recto/ano-vaginal fistula (RAVF) is one of the worst medical conditions that could lead a lady to suffer in her life. It represents a horrendous experience that might put the lady suffering that ailment not only on the brink of abandoning her social life, but even disrupting her marital life and breaking the integrity of her family. There are various operative methods implemented all over the past decades aiming to cure such medical condition. Of those, interposing a vascularized tissue flap is suggested as an operative solution to guarantee long term successful healing. Of which the most commonly tried is the bulbocavernous flap technique.

Patients and methods

Eighteen patients with both low and mid recto/ano-vaginal fistula, were repaired using martius graft transposition technique. And all fistulas were at least 8 months old. All patients were followed up for around one year postoperative for assessment of fistula healing and any associated persistent complications and side effects.

Results

All of the 18 patients included in the current study, were fully cured with no recurrence of fistula on one year follow up term, with 13 patients complaining mild dyspareunia that didn't hamper them resuming their sexual life. Out of eight patients with low fistula, of whom four had an old complete perineal tear with severed sphincter. five patients almost regained full control over flatus and stools. While two patients reported appreciably partial control over flatus and liquid stools.

Conclusion

Dissection and mobilization of fibrofatty graft (Martius graft) from the labia majora with intact blood supply for enforcing and supporting the site of repaired fistula is better than gracilis and gluteus grafts in surgical repair of recto/ano-vaginal fistula.

Keywords: Bulbocavernosus flap repair, fecal incontinence, Martius graft, rectovaginal fistula

INTRODUCTION

Recto/anovaginal fistula (RAVF) is defined as an abnormal communication between the lower gastrointestinal tract (GIT) lumen and the vagina. It poses great social impact on the patient and her family at the same time representing a surgical challenge for the surgeon [1].

Variable conditions can contribute to the occurrence of RAVF [2]. Fistula due to obstructed labor, and instrumental vaginal delivery is the most common form despite its extreme rarity with a reported incidence of 1 per 48 000 vaginal deliveries [3].

RAVF is classified into simple and complex fistulas. It is also classified into small or large according to its size, with a 2.5 cm cutoff. Also according to its location, it can be classified as high, mid, or low fistula [2,4].

The fistula should be well investigated. In addition, the function and integrity of the anal sphincter should be checked [4]. Imaging modalities such as ultrasound and MRI are frequently utilized recently to reach a solid diagnosis [5].

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Access this article online

Quick Response Code:



Website:
www.jmsr.eg.net

DOI:
10.4103/JMISR.JMISR_62_19

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Submitted: 26-Sep-2019 Accepted: 27-Nov-2019 Published: 11-Jun-2020

How to cite this article: Boghdady MA, Soliman HH. Martius graft transposition: a successful procedure for the ultimate repair of the anovaginal/rectovaginal fistula. *J Med Sci Res* 2020;3:53-7.

Other older traditional methods include vaginal tampons with rectal methylene blue installation, vaginography, and computed tomography scan with rectal contrast. Rectal endoscopy can help to exclude other causes, such as ulcerative colitis, Chron's disease, and malignancies [4].

Some fistulae can be managed expectantly, while others will need simple surgical techniques. Sometimes more advanced surgical maneuvers might be needed for repair [6]. Usually, the surgical approaches are classified as either local or abdominal repair, with the local repair considered the most preferred approach for low and simple rectovaginal fistula. Advancement flap repair, sphincteroplasty, fistulectomy, coloanal anastomosis, gracilis muscle repair, bulbocavernosus muscle flap or Martius flap, transanal sleeve advancement flap, perineoproctectomy with layered closure, biological agents such as fibrin glue or Surgisis plug [2,7,8], all are different treatment modalities and techniques.

PATIENTS AND METHODS

This is a retrospective observational descriptive study that included 18 patients presented to the Gynecology Outpatient Clinic of Al-Galaa Teaching Hospital with RAVF, in the duration between 2005 and 2013. Martius graft transposition was chosen to be the repair modality. The researchers started the study after obtaining the necessary approval from the Institution Ethics Committee permitting the research group to commence the study. Ten cases were identified to have mid rectovaginal fistula, while eight cases were diagnosed with low rectovaginal fistula. All patients had an age range between 20 and 33 years with a mean of 26 ± 2.54 . All patients had a parity ranging between p1 and p4, with a history of traumatic vaginal operative or obstetric incidence, dating more than 8 months, after which the patient experienced regular passage of offensive slimy liquid, semisolid or solid material (Table 1 shows patients' demographic criteria and duration of fistula). On clinical examination, 10 patients were found to have a middle rectovaginal fistula with a size of between 1 and 2.5 cm approximately in all dimensions, while the other eight cases had low-lying fistulas, with four having old perineal tears breeching the integrity of the anal sphincter. The approximate dimensions for the low-lying fistulas ranged between 0.5 and 2 cm on average. All the patients complained of symptoms of chronic vaginitis with passage of flatus, liquid, and semisolid stools and on examination signs of vaginitis with offensive discharge and slimy solid or semisolid material was easily identified. All fistulas were at least 8 months old with fibrosis of the edges. There were no definite exclusion criteria, and all cases were accepted for operative repair; there were no cases

with diabetes, hypertension, or any autoimmune disease or history of anticoagulation therapy, cardiac, or renal disease.

All cases were given vaginal antiseptic (Betadine vaginal douche) for 3 weeks preoperatively. All cases received local estrogen vaginal cream in the form of conjugated equine estrogen 0.625 mg twice daily applied for 1 month preoperatively with thorough rubbing of the fistula site, to soften the surrounding tissues and make it more pliable for handling during surgery. All cases were given intestinal antiseptic 6 days preoperatively in the form of oral metronidazole tablets 500 mg and Neomycin sulfate TDS. Also, clindamycin vaginal cream was given once daily at night 6 days preoperatively. Rectal enema was done every day at night for 3 days preoperatively. All patients were kept fasting for 2 days preoperatively, with only intravenous infusion given as supplementation to sustain the patient. All patients were postmenstrual at the time of the operation. Laboratory investigations were done, with complete blood count, liver functions, renal functions, and blood sugar results, all within normal values for all the patients.

Operative procedures were done under spinal anesthesia, and all patients had a Foley catheter inserted and fixed for continuous bladder evacuation. Each patient was operated in the lithotomy position with slight Trendelenburg tilting. The posterior vaginal wall below the fistula was incised transversely in the middle line and toward the lateral wall. The vaginal fascia was dissected in a cephalad direction separating it from the perirectal fascia reaching above the fistula and laterally reaching away the lateral sides of the rectum bilaterally. The firm fibrosis at the edges of the fistula were excised all around until observing healthy tissues. The orifice of the rectal side of the fistula was closed in continuous inverting lambert sutures with the edges directed to the inside of the rectal lumen and the prerectal fascia coopted and well sutured. Thereafter longitudinal labia majora incision was done reaching the fibrofatty tissue (bulbocavernosus tissue), to dissect and mobilize a flap of it, putting in consideration to tailor it so as to make a tapering flap with a wide attached base keeping the pudendal blood supply at the labia majora, and a narrower tapering mobile apex, which is tunneled through the posterior vaginal wall and stitched to the front surface of the rectum creating a Martius graft supporting and separating the sutured rectal wall from the vaginal wall. The vaginal wall was sutured after in continuous sutures.

Vicryl threads with 3/0 needles were used for all suturing. The vagina was well packed and Foley catheter was left for 24 h postoperatively. Antibiotics in the form of 1 g third-generation cephalosporin was given intravenous per 12 h for 6 days, in addition to metronidazole infusion 500 mg/8 h for 3 days. The patient was kept abstinent from any oral nourishment for 5 days, maintained only on intravenous supplementation. Sweeping the perineal area with antiseptic solution was done for 3 weeks.

Concerning patients with low fistula, or anovaginal fistula associated with or without disrupted sphincter, a different

Table 1: Patients' demographic data and fistula duration

Parameters	Range	Mean
Age	20-33	26±2.54
Parity	1-4	2.44±1.0416
Duration of fistula in months	8-22	12.94±4.122

approach was attained. A transverse incision was done at the mucocutaneous junction. The posterior vaginal wall and fascia were dissected upwards and lateral from the anterior wall of the anal canal reaching above the upper edge of the fistula. Midline incision was done cutting open the anal canal, external anal sphincter if not completely cut before, converting the anovaginal fistula into a complete perineal tear. The fibrous edges were removed followed by continuous suturing of the anal canal by 3/0 Vicryl needles. The perianal and anal fascia closed as well in layers by continuous suturing. Martius graft is pulled through from either one of labia majora and stitched over to the anterior anal wall.

Both the subcutaneous and the superficial parts of the external anal sphincter were dissected and mobilized on both sides of the anal canal and stitched together with number one Vicryl, using the little finger as a guide to the lumen contour. The muscle overlap technique was adopted for suturing the sphincter muscles. The posterior vaginal wall and fascia were stitched continuously with number zero Vicryl needles.

Foley catheter was secured inside the bladder and the vagina well packed for 24 h and the same postoperative protocol applied as described before. No patient allowed to resume any sexual activity before 4 months postoperatively. After 1 year, success of the repair was assessed through a series of questionnaire or tampon test in patients with any persistence of symptoms.

RESULTS

Repair of the RAVF using Martius graft proved to be an excellent method with 100% success rate on long-term follow-up, with not even one case of recurrence after 1 year. Fourteen cases delivered after the end of the follow-up period by a lower segment caesarean section. One delivered through the vaginal route; all patients did not develop any new complications concerning GIT continence postdelivery. The

operative outcome for all patients are summarized in Table 2, while the complications are summarized in Table 3.

One patient was divorced due to abstinence of resuming sexual life, fearing it might affect the integrity of her repaired fistula. One patient used oral contraceptive for multiple reasons, one reason was the obsession of pregnancy or any mode of delivery potentiality to spoil or disrupt the repair or enhance fistula recurrence. One case failed to conceive following resumption of her sexual life and she built up a personal concept putting a link between the repair and infertility.

DISCUSSION

RAVF is an abnormal communication between the lower part of the GIT and the vagina [4]. It usually presents with passage of flatus and stools through the vagina, recurrent urinary tract infection or even malodorous offensive vaginal discharge [2].

RAVF is considered, a challenging surgical condition for the surgeon, as well as a devastating condition to the patient, prohibiting her from freely interacting with her society, plummeting her quality of life, and even leading her to full isolation and withdrawal from social life [1]. A variety of conditions were identified to contribute to the occurrence of RAVF, of those are prolonged obstructed labor, rectovaginal septum abscess, inflammation, malignant tumors, and radiation. Crohn's disease and ulcerative colitis are also recognized causes of rectovaginal fistula [4], with an incidence of up to 9% with Crohn's disease [2].

Trauma during newborn delivery is considered the most common cause of RAVF. It can also occur in consequence to a malpractice during vaginal procedure. Example of these procedures include assisted instrumental delivery, and inappropriate repair of midline episiotomy or perineal support leading to fourth degree perineal tear [9–11].

RAVF is classified according to the size and location of the fistula. Simple ones are characterized by small size, that never exceeds 2.5 cm, and usually located at or close to the vaginal fourchette and the dentate line of the anal canal. In contrast complex fistula will exceed 2.5 cm, and is located higher up connecting the rectum and upper vagina, and usually surrounded with poorly vascularized tissue [4]. Also fistulas can simply be classified according to their location into low fistula if near or close to the fourchette and high fistulas if close to the cervix and posterior fornix, while middle ones exist in a position between the previous two types [12].

Concerning operative intervention for treatment of RAVF, different operative procedures have been described; accessing the fistula transrectally, transvaginally, or through laparotomy and laparoscopy [2]. Some techniques are based on simply excising the fistula tract, and repair of both the rectal and the vaginal wall and correction of any existing severed anal sphincter [6]. Other techniques include the endorectal advancement flap [13] and the endovaginal advancement flap [14].

Table 2: Postoperative favorable outcome

Postoperative outcome	n (%)
Full healing of the fistula	18 (100)
Full regain of continence	15 (83.33)
Partial regain of sphincteric continence	2 (11.11)
Patient resuming normal sexual life postoperatively	16 (88.88)
Patient conceiving postoperatively	15 (83.33)

Table 3: Postoperative complications and adverse outcome

Complications	n (%)
Patients developing dyspareunia	13 (72.22)
Patients developing postoperative tenesmus	5 (27.77)
Patients developing sense of fullness and discomfort at the perineum	5 (27.77)
Patients developing vaginitis	2 (11.11)
Patients developing diarrhea	2 (11.11)
Patients complaining marked labial and perineal disfigurement	3 (16.66)

Other repair techniques imply interposition of a mesh between the rectum and the vagina after closure of the fistula. Such mesh materials may be biologic as in case of porcine submucosa [15], or acellular cadaveric dermis graft [16]. Also polyglycolic acid mesh was described by Walfisch *et al.* [17].

Mobilized flap techniques including pudendal flaps, gracilis muscle flap, and bulbocavernosus flap have been suggested to create a barrier between the anterior wall of the anorectal tract and the vagina at the fistula site. The gluteal fold flap and lotus flap despite their successful results were not much accepted due to technical difficulty and complications [18].

Gracilis muscle interposition has been implemented as a surgical technique with a graft mobilized maintaining its vascularization from the obturator vessels. This technique was reported to cause gruesome complications including abscess formation, necrosis of the flap, deep vein thrombosis, anorectal and vaginal stricture, with decreased libido and quality of life [19,20].

Bulbocavernosus or Martius graft has been accepted as an easier and more successful procedure, with tissue transposition of musculo-fatty flap dissected and mobilized from the labial fold toward the suture line, to be fixed, yielding a favorable outcome [21,22]. In a study of nine patients with simple rectovaginal fistula, Cui *et al.* [21], found the Martius graft to be extremely effective in treating the condition with 100% success rate on 6–48 months follow-up duration. Such high success rate was attributed to the simple nature of the fistulas. In addition, the small number of patients hampers building up any solid conclusive outcome about the procedure efficacy.

McNevin *et al.* [23], in a retrospective study of 16 patients with rectovaginal fistulas, reported the Martius graft technique for repair of the fistula, coming up at the end with an excellent conclusion about the curative results of the procedure, with an achieved success rate of 93.8%. They also found the procedure to be cosmetically very good with no impairment of function of any pelvic or perineal structure. Yet, it is still classified as an expert opinion.

Goldaber *et al.* [2] in a study of 12 patients for whom Martius graft was used for the repair of rectovaginal fistula, reported a high success rate with 11 patients having their fistulas successfully treated. Unfortunately, those patients had fistulas due to radiation therapy, which does not have relevance in the nature to the fistulas in the present discussed study. The same outcome was retrieved with Aartsen and Sindram [24], where similar results were achieved, with 14 patients cured reaching a cure rate of 93%, with no recurrence of fistula on 10 years follow-up, yet still the fistulas were radiation induced.

On the other hand, reports by other authors did not endorse such results with Zimmerman *et al.* [25] mentioning only 50% success in a study of 12 patients. Also, Pitel *et al.* [22] reported a success rate of 65% for such procedure. In the current study, 18 patients were treated with Martius flap as a surgical procedure for their rectovaginal fistula, with all patients receiving antibiotic treatment for almost 1 week to

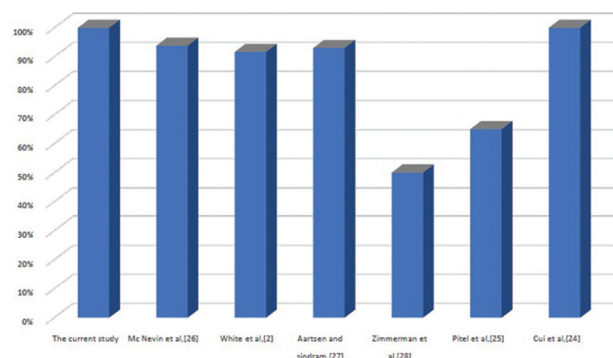


Figure 1: Comparison of the success rate of Martius graft procedure in the current study with other similar studies.

resolve any infection, and local conjugated equine estrogen for 1 month to increase tissue pliability and softness. In addition, all the fibrous tissue around the orifice of the fistula was removed before closing it and suturing the rectoanal and the vaginal wall in layers, after which repair of the external anal sphincter using the overlap technique was done if indicated. All patients had their fistulas fully healed with no recurrence on 1 year follow-up period. That is in accordance with the previous mentioned results by Cui *et al.* [21], and McNevin *et al.* [23]. Exceptionally in the current study all fistulas were simple and consequential to obstetric trauma, whereas the patients in those other studies had fistulas due to inflammatory large bowel disease. Fig 1 demonstrates a comparison of the success rate of Martius graft procedure in the current study and other proximate and similar studies.

Concerning the complication and side effects of the procedure, in the current study we had one patient with a disrupted sphincter, passed no more gut content per vagina, yet informed no tangible improvement of the sphincteric function postrepair. Thirteen patients complained variable degrees of dyspareunia for the first 8 months of resuming their sexual life, with even one patient divorced because of fear of resuming her sexual life. Five had a sense of tenesmus and continuous defecation desire up to 3 months postoperatively. Two patients had diarrhea for around 1 month postoperatively, and five patients mentioned some perineal swelling and discomfort persisting for the whole postoperative follow-up period. Two patients complained of mild continuous vaginal discharge, much less offensive than before, and were controlled by vaginal wash and local antiseptic suppositories, yet recurred few days after stopping medications. Concise structured demonstration of adverse outcomes are presented in Table 2.

Similarly, Cui *et al.* [21], in a descriptive study of nine patients with Martius graft repair done to treat rectovaginal fistula reported anal discomfort in all their patients postoperatively. In addition, three patients developed tenesmus. All the symptoms disappeared shortly within 2 weeks after the procedure. Three patients had wound swelling due to variable causes including hematoma and infection, and all were ultimately resolved. Only one patient was reported with dyspareunia.

McNevin *et al.* [23] in a small descriptive study of 16 patients did not recognize major complications with the Martius flap procedure, with the existence of dyspareunia in all cases, limiting sexual practice only in one patient. Two patients kept their fecal incontinence, while no other major adverse sequelae were reported.

CONCLUSION

It can be concluded that strict aseptic technique is essential in the preoperative and postoperative period in order to get good healing and excellent prognostic outcome of the fistula repair. Excision of fibrotic edges of the fistula before repair enhance rapid healing of viable tissues. Use of estrogen cream vaginally before repair of fistula allows easy dissections of the posterior vaginal wall from the rectal wall at the fistula site. Dissection and mobilization of fibrofatty graft (Martius graft) from the labia majora with intact blood supply for enforcing and supporting the site of repaired fistula is better than gracilis and gluteus grafts.

Acknowledgements

The authors express their appreciation and gratitude toward the operation theater nursing team and the ward nursing team for their contribution to the success of this work.

This study is a retrospective, observational, descriptive study.

Any author included in that work should have participated in the operations or operated some of those patients included in the study. Any author should have gathered and collected some of the data and references included in the written article of the work.

Each author read and revised the article. Each author believes that he met the inclusion criteria for the work and believes the work to be true and honest work.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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