

The Martius Flap's Effectiveness in the Repair of Vesicovaginal Fistulae

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Abstract

Objective: The study sought to determine the efficacy of the Martius flap in treating difficult VVF (Vesicovaginal fistula) greater than 2.5 cm in size.

Study design: A descriptive case series

Place and duration of study: From January 2018 to December 2020, this study was conducted in the department of urology at Khalifa Gulnawaz Teaching Hospital in Bannu.

Methodology: The patients' case records were evaluated. Following a vaginal examination to establish leakage, all patients had cystoscopy to determine the fistulae, location, and tissue scarring. All patients had a CT urogram and cystogram, as well as a urine c/s. A modified Martius flap repair was carried out. They were released on the second surgical day and were monitored for three months.

Results: Ninety individuals had vesicovaginal fistulas repaired using a modified Martius flap. The patients' average age was 35 years. Obstruction of labor was the most common etiological cause in 70 (77.7%) of the patients, followed by gynecological procedures in 16 (17.7%). Twenty patients (22.22% of the total) underwent surgery to treat recurrent fistula formation. After surgery, 7 (7.7%) patients exhibited stress incontinence and were treated conservatively with pelvic floor exercises. Three (3.3%) women had vaginal bleeding, and two (2.2%) had labial wound infections. Recurrence occurred in two (2.2%) of the patients.

Conclusion: The modified Martius flap is a successful therapeutic method for vesicovaginal fistula with fewer complications and great aesthetic results.

Keywords: Vesicovaginal fistula (VVF), Martius Flap, Urinary Incontinence.

Cite as: Hamid H, Farooq K, Khan IA, Khanum Z, Ullah R, Ayub U, Jan MA. The Martius Flap's Effectiveness in the Repair of Vesicovaginal Fistulae. BMC J Med Sci 2022. 3(1): 34-37.

Introduction

Urogenital tract fistula is still a major issue in third-world nations. It can lead to a variety of social and healthcare difficulties. Its global prevalence is estimated to be approximately 2 million cases.¹ Its prevalence is estimated to be 1-2 per thousand births. After a difficult labor, Herodotus saw continual urine leaking. In 1037 AD, Avicenna, a Persian physician, reported the link between VVFs and obstructed labor.² Although obstructed and prolonged labor is the most prevalent etiological reason, accounting for 80-90% of cases, gynecologic and iatrogenic

injuries have lately grown in frequency. Simple fistulae are those that are less than 2.5cm in length, whereas complicated fistulae are those that are larger, numerous, or recurring. It also includes fistulae caused by cancer and radiation.¹

Although VVFs have become rare in the developed world, they are still widespread in poor nations. The general public and the international medical community are mostly uninformed of the situation. The high frequency of early marriage and childbirth among fistula patients, the low literacy rate, and the limited adoption of traditional prenatal

Authorship Contribution: All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published;

Funding Source: none

Conflict of Interest: none

Received: Mar 11, 2022

Accepted: June 29, 2022

care. Socioeconomic variables are likely to be the most important factors leading to the high incidence and prevalence of obstetric fistulas. In disadvantaged places, early marriage, low social standing for women, hunger, and badly established social and economic infrastructure are all more frequent. Most critically, in impoverished areas, there is widespread lack of access to emergency obstetric services. VVF rates may potentially approach maternal mortality rates in places of the globe where obstructed labor is a substantial contributor to maternal mortality.⁴

Urine leaking from the vaginal canal is a typical postoperative VVF symptom. Severe leukocytosis is possible. Fistulas are most common between the seventh and twelfth day after obstetric or gynecologic surgery. Filling the bladder with a mild methylene blue solution can assist confirm the diagnosis. The tampon test, which entails inserting a tampon into the vagina after filling the bladder with the solution and ambulating the patient, can aid in the diagnosis of urinary incontinence. Cystoscopy can also be very useful in pinpointing the exact anatomic cause. Tiny fistulas may benefit from placing a tiny ureteric catheter down the suspected fistula tract to test if it enters the vaginal canal.⁴

Simple fistulas can be treated conservatively or surgically. In the repair of complicated fistulae, interpositional tissue/flap/graft is indicated. Many surgeons choose the Martius flap because of its ease of access, high vascularity, and proximity to the fistula site. It helps to separate the two healed suture lines, and also responsible for rapid neovascularization, and lymphatic drainage. It has no functional or aesthetic disadvantages, making it the chosen tissue for interpositioning.^{5,6} Uro-genital fistulas, the vast majority of which are vesico-vaginal fistulas (VVF), pose a significant issue to women in underdeveloped nations. It is one of the most serious consequences of childbirth and is frequently caused by prolonged obstructed labor. Urogenital fistulae are uncommon in the industrialized world, but are a common problem in underdeveloped nations such as Pakistan, where they are usually caused by protracted obstructed labor due to inadequate obstetric treatment. All varieties of urinary fistulae can be healed using basic surgical procedures.⁷ The current study focused to find out the efficacy of the modified Martius flap in uncomplicated vesicovaginal fistulas.^{8,9}

Materials and Methods

A case series was undertaken at Khalifa Gul Nawaz Teaching Hospital's Departments of Urology in Bannu. The records of individuals who underwent surgery between January 2018 and December 2020 were examined. It included 90 patients ranging in age from 16 to 56 years. Patients with complicated fistulae and those requiring abdominal approach repair were not included.

All of the patients were admitted through the emergency department. Under anesthesia, patients were evaluated and a cystoscopy was conducted to determine the number of fistulae, their location, and the amount of tissue scarring. When necessary, dye tests were performed. In addition to regular baseline tests, a CT urogram with cystogram images, urine culture, and sensitivity was done. A minimum of 4-6 months had passed since the prior procedure.

Compression stockings were used the day before surgery, and a triple sulpha vaginal swab was implanted and withdrawn in the operating room. A single dosage of antibiotics was administered before surgery. Cystoscopy was performed, and bilateral ureteric catheters were passed to locate the fistula location. The fistula was dissected and scar tissue was removed during the procedure until healthy tissue margins were established. Viacryl 3-0 sutures were used to seal the urinary bladder. An 8-12 cm incision in the labia majora was made, and the fat pad was dissected out. A tunnel was created in the vaginal wall to bring in the pedicled flap, which was then put on top of the repaired vesical surface.

Viacryl 2-0 and pyodine-soaked packing were used to seal the vaginal wall in a single layer. Subcuticular stitches were used to seal the labial incision. For three weeks, the patient was catheterized. After 24 hours, the vaginal pack was excised. On the second postoperative day, patients were discharged and followed for three months. Patients were advised to avoid vaginal intercourse and vaginal delivery for at least 6 months⁹.

Results

This research included 90 individuals who had vesicovaginal fistulas repaired using a modified Martius flap. The patients' average age was 35 years, with a range

Etiology						
Total no of pts	Prolonged labour	Obstructed labour	Gynaecological procedures	Radiation	Primary repair of vvf	Recurrent repair
90	70	16	03	01	70	20

Complications of VVF repair 2										
haematuria	Stress incontinence	Labial infection	Vaginal bleed	dysperunia	numbness	DVT	Clot formation	hematoma	constipation	recurrence
08	07	02	03	07	03	02	02	01	08	02

of 16-56 years. Obstructed protracted labor caused VVF in 70 (77.7%) of the patients, followed by 16 (17.7%) of the patients who had previously had gynecological operations. Three (3.3%) individuals got VVF as a result of radiation/malignancy. One (1.11%) of the patients had a history of pelvic fracture.

Twenty (22.22%) of the total patients operated on had recurring fistulas treated, whereas 70 (77.7%) had original fistulas corrected

Eight (8.8%) individuals suffered hematuria after surgery, which was treated with a bladder wash. Patients with stress incontinence were treated conservatively with pelvic floor strengthening exercises in 7 (7.7%) cases. 2 (2.2%) of the patients had a labial infection. Intermittent packing was used to treat 3 (3.3%) cases of vaginal bleeding. Dyspareunia was detected in 7 (7.7%) patients, and numbness was described in 3 (3.3%) individuals, who were similarly conservatively treated. Deep vein thrombosis (DVT) occurred in two individuals (2.22%). Two individuals had clots, and one (1.1%) developed a hematoma collection, which was handled conservatively. Constipation affected eight people (8.8%), and they were given stool softeners and laxatives. Two (2.2%) of the VVF repair patients experienced recurrence.

Discussion

A modified Martius flap for difficult vaginal fistula repair is a viable surgical alternative. Because of its dual blood supply, it is the preferred tissue for use as an interpositioning flap. In situ Martius flap is a recent surgical innovation in which the labial incision is avoided, keeping the pudendal nerve intact, and resulting in a lower complication rate of numbness and dyspareunia^{9,10}. Good scheduling of operation, proper exposure, thorough excision of scar tissue, extensive dissection of the vaginal flap, and sufficient postoperative drainage are the concepts that underpin successful surgical repair of fistulae¹¹⁻¹³.

In VVF, there is disagreement on the timing of repairs. Flisser and Blaivas propose fistula repair within 10 days after the start. However, some surgeons want at least four months for inflammation to decrease and tissue health to be restored, assuring a successful repair. The use of the Martius flap also allows for the early healing of fistulae because the fresh interposed tissue stops the continuing ischemia process at the repaired sites through angiogenesis. Our guideline calls for the fistula location to be repaired at least four months following the damage¹³⁻¹⁵

In our study, the most prevalent causes of VVF development were prolonged labor (77.7%) and gynecological procedures (17.7%). It is consistent with other research undertaken in third-world nations. In our

study, 1.23% of patients developed hematomas at the site of labial fat pad harvesting, whereas 3.3% experienced vaginal hemorrhage. A hematoma and wound infection were seen in 5.4% of the participants in one research. They determined that the Martius flap had little influence on the patients' physical appearance.

Dyspareunia was reported by 7.7% of patients who had Martius flap surgery in our setting. In research, 13% of patients had dyspareunia and 62% reported numbness at the harvest site. The lower percentage of these problems in our study can be attributable to societal factors and patient underreporting. In research comparing Martius flap to basic anastomotic repair, it was discovered that none of the Martius flap patients developed dyspareunia, but 33.33% of the anastomotic repair patients did. 6 In our study, 2.2% (2/90) of patients had a recurrence of the fistula, which is comparable to previous studies¹²⁻¹⁷.

Urethrovaginal fistulae are a rather uncommon condition. It is a conceptual error to think of urethrovaginal fistulas as synonymous with vesicovaginal fistulas. Urethrovaginal fistulae are a distinct entity that needs specific attention and treatment. Because of the great range and distinctiveness of the clinical symptoms of various injuries, it is very hard to establish and develop standard therapeutic guidelines. Given the complexity of treating urethrovaginal fistulas, we decided to perform a review of the current literature on issue^{18,19}.

Nawaz et al. reviewed the cases of surgical outcomes of urogenital fistulae. Uretero vaginal fistulae were caused mostly by undetected ureteral injuries during gynaecological operations. Transvaginal repair was employed in 39.84% patients for vesico vaginal fistulae, while trans abdominal repair was used in 52.63% patients. Vesico vaginal fistulae had 12.03% failures with an 88% success rate. The average hospital stay was 15 days, with an average follow-up of 8 months. In their study, the majority of the female urogenital fistulas in this series were vesico-vaginal, with the majority of the women being of childbearing age. Obstetrical trauma was the most prevalent cause²⁰.

35 patients, the Martius graft, a labial fibro-fatty tissue transplant, was used as an adjuvant approach in the treatment of 37 complicated fistulas in a study of Elkins et al. The graft was utilized to treat three types of non-radiation-induced vesicovaginal fistulas: 12 patients with extensive obstetric fistulas (more than 4 cm), six patients with obstetric fistulas that produced urethral sloughing, and six patients with recurring obstetric or post-hysterectomy fistulas. Overall, the success percentage was 86.5%. Anatomical examinations on the graft in a cadaver revealed that it is made of fibroadipose tissue from the labium majus rather than the bulbocavernosus muscle. It is supplied with

blood anteriorly by the external pudendal artery and posteriorly by the internal pudendal artery. Within the graft, these veins create a plexus. The predominance of fibrous tissue in this fibroadipose tissue is due to a superficial tunic of fibrous tissue, comparable to the tunica dartos in males, as well as significant fibrous septa inside the adipose tissue itself.²¹

Conclusion

The modified Martius flap is an effective treatment procedure for vesicovaginal fistulas that has fewer problems and excellent cosmetic outcomes. The modified Martius flap is a potential therapeutic choice for the therapy of vesicovaginal fistulae, with a good success outcome.

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