

Comparison of Transvaginal Repair of Vesicovaginal Fistula with and without Martius Flap

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ABSTRACT

Background: Different approaches and techniques have been adopted to repair Vesicovaginal Fistula (VVF) successfully. However, role of tissue interposition in success of VVF repair is still controversial. **Objective:** To compare the outcomes of transvaginal repair of Vesicovaginal fistula (VVF) with and without martius flap in terms of success rate and recurrence. **Study Design:** Randomized control study. **Settings:** Department of Urology Lahore General Hospital, Lahore Pakistan. **Duration:** One year and six months from January 01, 2019 to June 30, 2020. **Methodology:** Total 40 patients with VVF were included in the research, malignant, radiation induced and complex fistula are excluded. 40 patients of transvaginal repair of VVF, split into two groups, randomized by serial number technique each consisting of 20, group A repaired with martius flap and group B with simple repair without martius flap. After 2, 4 and 8 weeks all the patients were assessed for recurrence or any other complication. The data was collected in a specially designed proforma. **Results:** 40 patients fulfilling the inclusion criteria were included, 20 patients in each group. Mean age of group A patients was 36.70 ± 5.16 and of that group B was 37.10 ± 4.58 . 33 (85.5%) patients have supra-trigonal fistula, while 7(14.5%) had trigonal fistula and mean fistula size was $1.96 \text{ cm} \pm 1.0$. The success rate was 100% (20/20) in group A, while in group B, 95% (19/20) with recurrence in one case. Chi square analysis was employed for comparison of adequacy of both the techniques. p-value was found to be 0.311 which suggests that the difference between the efficacies of two techniques was not statistically significant. **Conclusion:** Both the techniques of transvaginal repair of simple benign Vesicovaginal fistula are successful with equal success rate in martius inter positional flap repair and simple bilayer repair without flap.

Keywords: Vesico-vaginal fistula, Martius flap, Success rate.

INTRODUCTION

Abnormal epithelized communicating tract between vagina and urinary bladder in female is called vesicovaginal fistula (VVF) that causes continuous involuntary leakage of urine. It is an ancient disease and has been described since 2050 BC as a large vesicovaginal rent and laceration of the perineum noted in a mummified woman, that was most likely due to birth trauma.¹

Vesicovaginal fistula is still an embarrassing complication in female Urology both in developing and developed world.² It causes both physical and psychosocial morbidity to suffering women. In

underdeveloped areas, VVFs occur due to obstetric complications where there is limited access to prenatal and obstetric care. In developed areas of world, VVFs usually occur as a complication of gynecological, urological or abdominal/pelvic surgeries.³ Other causes include malignant pelvic organ diseases and radiotherapy of the pelvic organs cancers.^{4,5} Reported incidence of VVF due to gynecological issues surgery is calculated to be 1/1200 of all transabdominal open hysterectomies and 1/455 of all laparoscopic hysterectomies.¹ Reports estimate that about 2 million women are living with untreated obstetric fistulae. 50000-100000 new cases are reported annually.⁵ In certain

areas of Africa the rate of fistula may be as high as 5-10 per 1000 baby deliveries. According to reports of Mayo clinic, the cause of genitourinary fistula in most cases is gynecological surgery (82%) while by obstetric injury in 8% and by irradiation in 6%.

At first time, the basic principles of VVF repair were described by Hedrick in 1663, and in 1852, Maram Sims carried out the first successful VVF repair.⁵ Over period of one and half century different approaches and techniques have been adopted to repair VVF successfully. However, there are still many controversies in the type of treatment (conservative or surgical), in the optimum time of treatment (early or late), in the type of surgical technique (trans-vesical / transabdominal / transvaginal / laparoscopic or robotic), in the use of tissue interposition and in the type of urinary diversions used postoperatively (urethral catheter with or without cystostomy tube).⁶ The treatment approaches are dependent on many factors like site, size involvement and condition of nearby organs and particularly on the experience of the surgeon. Despite the common occurrence of VVF there is no consensus over management algorithm of this lesions.⁷ Small, benign VVF can be managed conservatively by prolonged catheterization, application of glue or fibrin after fine cauterization of margins. But surgical repair is preferred approach for all sizes of VVF with success rate of about 75-95% with variant approaches.⁸ In surgical approach in general, simple fistulae are treated by using the vaginal approach, whereas complex fistulae are commonly treated using an abdominal approach.^{9,10} Inter positioning of nearby healthy tissue is preferably used for better outcomes.¹¹ In the literature, the success rate for VVF repair using the transabdominal approach is 87.5% and using the transvaginal approach is 87%.^{12,13}

The repair through vagina is less invasive and favored by patient. It involves the separate repair of bladder and vagina with or without inter-positioning of tissue. The postoperative patient comfort is higher, and the hospital stay is shorter. Additionally, patients are free of abdominal surgical complications. Two main techniques for the transvaginal repair are; the simple bi-layer repair technique and the Martius inter positioning flap technique. Labial fibro fatty pad (Martius flap) is used for inter positioning of fibro fatty tissue in the fistula repair. In case of insufficiency of one-sided labial fat pad flap, a second flap from the other side can be used. Success rate in different studies for Martius flap technique has been shown high up to 100%.¹⁴ In a recent study Shehzad Ashraf *et al*, it has been shown that 100% success rate can be achieved by simple bi-layer repair of trigonal and supra trigonal benign fistulae of any size.² In current study have compared the results of Vesicovaginal fistula repair through transvaginal approach with and without Martius flap (labial fibro fatty flap) in terms of success rate and recurrence.

METHODOLOGY

Study Design: Randomized control study.

Settings: This study was carried out in the Department of Urology Lahore General Hospital, Lahore Pakistan.

Duration: One year and six months from January 01, 2019 to June 30, 2020.

Sample Technique: Non-probability, purposive sampling was used to select the patients and then patients underwent surgical procedure randomly.

Sample Size: According to (Ashraf *et al.*, 2014) and (Lee D *et al* 2013) both techniques had 100% success rate. Thus, all the patients coming to Department of Urology Lahore General Hospital Lahore during study period were included in the study.

40 patients of VVF were selected on basis of history, physical examination and investigations and were divided in two groups A and B having 20 patients in each group. Sample size was calculated by following formula keeping the power of study equal to 20%.

Sample size was 20 in each group.

$$Z\beta 2 [p1(1 - p1) + p2(1 - p2)]$$

$$(p2 - p1)^2$$

P1 is the anticipated proportions of success in Simple repair = 100%, P2 is the anticipated proportions of success in Martius flap repair = 100%, P1-p2 is the difference between proportions = 0% and ZB2 is the desired power of study = 90%.

Selection Criteria: 40 patients of vesicovaginal fistula were selected by history, physical examination, KUB ultrasonography, cystography, IVU and cystoscopy. Selection criteria was as under:

Inclusion Criteria:

Benign un-operated VVF of any size.

Recurrent VVF after abdominal approach.

Exclusion Criteria:

Small immobile vagina.

Concomitant urethro vaginal or uretero vaginal fistula.

Radiation induced VVF.

Malignant fistula due to malignancy of bladder or other pelvic organs. Multiple fistulae.

Data Collection Procedure: All patients were examined and investigated to confirm the diagnosis by retrograde cystography, intra venous pyelography/CT-Urography and per-operative cystoscopy. Routine investigations like CBC, FBS, Hepatitis and HIV, RFTs, LFTs, PT/APTT/INR were done. Information regarding age, parity and etiological factors like prolonged labor, lower segment C/S, instrumental delivery and TAH were noted. Each patient was explained fully about the procedure and informed consent was taken. During surgery size of fistulae was noted. All the procedures were performed by the surgeon who had a surgical experience of at least five years in Urology. All patients were assessed by examination and retrograde cystography, for recurrence on 12th day, 4 weeks, 8weeks and 12 weeks. Incidence of early and delayed recurrence

was noted. Post-operative morbidity in terms of pain and discomfort was noted and recorded. Data was collected in specially designed Performa.

RESULTS

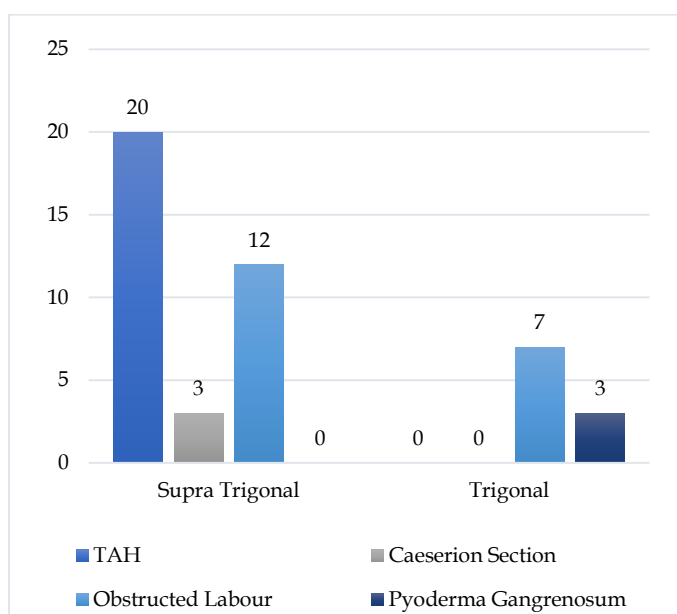
In this study 40 subjects were randomly divided into two groups of 20(50%) each. Total abdominal hysterectomy was the most common cause of VVF that accounts about 50%. (Table 1)

Table 1: Frequency distribution of patients according to cause of fistula

	Frequency	Percent
TAH	20	50.0
Caesarian Section	2	5.0
Obstructed Labour	17	42.5
Pyoderma Gangrenosum	1	2.5
Total	40	100.0

The mean duration of symptoms incontinence was 9.6±7.9 months. 33 (85.5%) patients have supra-trigonal fistula, while 7(14.5%) had trigonal fistula and mean fistula size was 1.96 ±1.0cm. the causes of supra-trigonal and trigonal fistula are shown in figure 1.

Figure 1: Comparison of site of fistula and cause of fistula



Transvaginal repair with martius flap showed 100% (20/20) success, while one patient in simple bilayer repair without martius flap had recurrence but that is not statistically significant. (Table 2)

Table 2: Comparison of groups according to outcome post-operative day 12

	Group A	Group B	Total
No leakage with Mild pain (cured)	10 (50%)	10 (50%)	20 (50%)
No leakage with moderate pain(cured)	0 (0%)	2 (10%)	2 (5%)
No leakage no pain (cured)	10 (50%)	7 (35%)	17 (42.5%)
Leakage on 12th POD	0 (0%)	1 (5%)	1 (2.5%)
Total	20	20	40

DISCUSSION

Vesicovaginal fistula causes continuous involuntary leakage of urine through vagina, although untreated women try to manage wetting of cloths by using perineal pads but persistent odor causes embarrassment for that women, then they avoid social events and are unable to perform their religious duties that is misery to affected women.

Presentation of VVF is often late in poor countries. Lee and colleagues have reported 97% success rate after repairing of VVF trans-vaginally by using inter-positional flap of fibro-fatty tissue of labia majora. Mean age was 45 years. 88% of the cases were from gynaecological surgery. In my study success rate of martius flap repair of VVF is 95%. Mean age is 37.67 years. In my study 50% of VVF are due to gynaecological surgeries (total abdominal hysterectomy), 5% by caesarean sections and 42.5% by obstructed labours and 2.5% by other causes. This difference of etiology is due to high quality of obstetrics services in developed countries and relatively poor services in rural areas of Pakistan that is reflected in my study.

Shoukry MS *et al*, have reported 100% success rate by using vaginal flap reinforcement for VVF fistula repair while in my study 100% results are in simple repair without inter-positioning flap.¹⁵

Shehzad *et al* in 2014 achieved 100% results without any reinforcement or interposition of different tissues.² My study also shows 95% cure rate with simple bi-layer repair without martius flap. Only mild pain was experienced by patients for 1-2weeks post-operatively that was relieved by removing the Foleys catheter. Hanif MS reported in 2005 in his study at Karachi that 71.4% of VVF developed from obstetric reasons and 28.6% from gynaecological reasons.¹⁶

Jalbani MH *et al* in 2006 at Larkana reported cause of VVF was obstetrical in 80% and 17.5% was Gynecological.¹⁷ My study shows reduced obstetric cause that is 42.50%. This difference seems to be due to poor obstetric services in rural areas of Sind and under-developed parts of Karachi. My study shows improved obstetric care in Punjab within last decade. Other surgeons used omental, peritoneal, Martius flaps and gracilus muscle as an inter-

positioning tissue between vagina and bladder for VVF repair. Laparoscopic and robotic repair of fistula has also been introduced. But my study of vaginal repair for VVF with and without martius flap shows excellent results with no statically significant between two techniques, but 50% of patients experienced mild pain until 12th postoperative day that was resolved on removing Foleys catheter. One patient repaired without Martius flap developed recurrence probably due to unhealthy tissue at repair site due to disease pyoderma gangrenosum that was the cause of that fistula even before one year of her marriage. This was a unique recurrent case but patient did not follow beyond one month. Findings similar to the results of my study has also been reported by Sing *et al*, in 2019 in a study of comparison of results of simple transvaginal repair of VVF with transvaginal repair with Martius flap and transabdominal repair with or without omental flap.¹⁸ 93.1% of repairs were successful with Martius flap by transvaginal repair while simple repair without any flap scored 96.43% success rate. In trans-abdominal repairs success was 97.1% with omental flap and without any flap success was 97.06%. Similar to results of my study mild postoperative morbidities like pain were seen in patients treated by inter positional flaps.

CONCLUSION

It is concluded that benign vesico-vaginal fistulae can be repaired with equal success rates Trans vaginally with or without Martius flap inter positioning.

LIMITATIONS

Single centre study with small sample size.

SUGGESTIONS / RECOMMENDATIONS

To liaise with other regional centres to have multicentre large-scale study on VVF repair of simple and complex fistulas and to draft regional guidelines

CONFLICT OF INTEREST / DISCLOSURE

The authors have no conflict of interest.

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