

## Martius Graft Repair of Vesico-Vaginal Fistula: Experience at A Tertiary Care Center in Bangladesh

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### Abstract

**Background:** Vesico-Vaginal Fistula (VVF) is a pathology with severe social repercussions. Resolution of VVF can be achieved through multiple surgical, abdominal or vaginal techniques, which will generally depend on the fistula's characteristics and the surgeon's experience. In this study we describe our experience with vaginal approach to treat VVF using Martius graft repair.

**Materials and methods:** This prospective observational study included 50 VVF patients operated in the fistula center of Chittagong Medical College Hospital, during the period of January 2013 to December 2014. The success rate and complications of Martius graft repair of VVF.

**Results:** The leading age group was 26 to 35 years (50.0%) and age range from 16 to 60 years with a mean age of 32.1 ( $\pm$ SD 8.10) years. The majority (72.0%) was from low socioeconomic class and had short stature (64.0%). 48% fistula was midvaginal, 28% was juxtracervical and 54% was <2 cm in size and 40% were associated with vaginal stenosis and urethral avulsion. In 36% cases postoperative complication were developed. 82% patients were fully cured, 6% cured with urethral incontinence, 2% cured with vaginal stenosis and in 10% cases surgery was failed.

**Conclusions:** The vaginal technique for the treatment of VVF reinforced by Martius graft is safe and effective with low rate of complications.

**Key words:** Failure; Martius flap; Success; Vesico-vaginal fistula.

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### Introduction

Vesico Vaginal Fistula (VVF) occurs due to complications following obstructed labor and/or gynecological procedures. While obstructed or prolonged labour continues to be the leading cause in developing countries, iatrogenic injury during obstetric or gynaecologic surgery such as caesarean section or hysterectomy is the most common cause in the industrialized world.<sup>1,2</sup> VVF is a debilitating condition. Uncontrolled leakage of urine into the vagina with unpleasant odour, excoriation of vulva and discomfort causes serious social, mental and physical problems for the women.<sup>3</sup>

There is currently no gold standard technique for the management of a simple VVF. Traditionally fistula repair was carried out by either transabdominal or transvaginal approach with success rates ranging from 50 to 100%.<sup>4</sup> The interposition flap is traditionally used in transabdominal and transvaginal repair of VVF. The purpose of using this flap is to prevent the apposition of suture lines, to increase the success rate of fistula repair, and decrease postoperative dyspareunia.<sup>5</sup> Various interposition flaps have been described in the literature. These include omentum, peritoneum, tinea epiploica, labial and rarely myocutaneous or gracilis muscle flaps. Of these the omentum is the most commonly preferred interposition flap in transabdominal repair, while the labial fibro-fatty flap (Martius flap) is the most common interposition flap for transvaginal repair.<sup>6-9</sup>

Transvaginal repair of VVFs with Martius flap transposition has now been carried out at our institution owing to a multitude of advantages. The aim of this study was to highlight VVF repair with Martius flap reinforcement as an excellent approach for repair of a simple VVF without compromising on the successful patient outcomes.

### Materials and methods

This prospective observational study was conducted in the fistula center, Chittagong Medical College Hospital from January 2013 to December 2014. Consecutive 50 cases of VVF operated in this period were included in the study. Patients with rectovaginal fistula and other types of genitourinary fistula were excluded from this study. The study was approved by the Ethical Review Committee of Chittagong Medical College. All aspects including confidentiality and right not to participate were duly considered. Informed written consent was obtained from all patients.

All patients were evaluated preoperatively by history, physical examination, serum creatinine, ultrasonography abdomen and intravenous urography. A cystoscopy was performed and the following details were noted – the location, size and numbers of the fistulas, distance from the ureteric orifices, condition of the mucosa around the fistulous opening, thickness of fistulous septum. Patients with urinary tract infection were treated with antibiotics for 2 weeks preoperatively.

Following cystoscopy, the ureteric orifices were catheterized with 5 French (F) ureteric catheters if they were close to the fistula to prevent inadvertent intraoperative injury. Another 6F ureteric catheter was brought out of the vagina (Over a guidewire) following insertion through the fistulous tract. The 18F Suprapubic Foley Catheter (SPC) and 16F Per Urethral Foley Catheters (PUC) were placed. Gentle traction was placed on the 6F ureteric catheter (Within the fistula tract) to view the margins of the comparatively higher-placed fistula. The fistula was incised circumferentially with a margin of approximately 0.5–1.0 cm, and a plane was created by performing sharp dissection between the urinary bladder and the vagina. Full-thickness closure of bladder wall was performed with interrupted 3-0 polygalactin sutures. The perivesical fascia was closed with interrupted 3-0 polygalactin sutures. The Martius flap was harvested from the labia majora and tunneled under the vaginal mucosa to be fixed as an interposition flap over the bladder's suture line. The vaginal incision was closed in a single layer with interrupted 3-0 polygalactin sutures. The

incision on labia majora was closed in 2 layers with absorbable sutures after insertion of a Penrose drain, which was removed after 48 hours. The patients were discharged after 3–7 days with postoperative advice regarding the intake of anticholinergics (Tolterodine 2 mg, twice a day) antibiotics (Prophylactic dose) and stool softeners. Continuous urinary drainage was maintained for three weeks with SPC and PUC in situ. A voiding trial was given at 3 weeks. Failure of VVF repair was defined as urine leakage per vagina either before or after catheter removal. The patients in whom the procedure failed were called after 3 months for reassessment and repeat fistula repair. All the necessary information and clinical data from each of the study patient were collected and recorded systematically in a predesigned questionnaire. Data was processed and analyzed by using computer bases software SPSS-15 (Statistical Package for Social Science). Finally, data were compiled and present in table and graph accordingly.

### Results

A total number of 50 cases of VVF were recruited for this study who were fulfilled the inclusion and exclusion criteria. The leading age group was 26 to 35 years (50.0%) and age range from 16 to 60 years with a mean age of 32.1 ( $\pm$ SD 8.10) years. The majority (72.0%) was from low socioeconomic class and had short stature (64.0%). Baseline demographic and clinical characteristics were presented in Table I.

**Table I** Baseline characteristics of the patients (n=50)

Variables	Frequency	Percentage (%)
Age group		
25 years	12	24.0
26-35 years	25	50.0
>35 years	13	26.0
Socioeconomic status		
Lower	38	72.0
Lower middle	10	20.0
Upper middle	2	4.0
Antecedent event		
Vaginal delivery	28	56.0
Assisted vaginal delivery	10	20.0
Caesarean section	8	16.0
Hysterectomy	4	8.0
Parity		
Up to 2	30	60.0
More than 2	20	40.0

Height of the patients		
≤145 cm	32	64.0
>145 cm	18	36.0
Location of fistula		
Midvaginal	24	48.0
Juxtracervical	14	28.0
Circumferential	12	24.0
Size of fistula		
Small < 2 cm	27	54.0
Medium 2-3 cm	18	36.0
Large > 3 cm	5	10.0

Mobilization during operation was excellent in 18% of the cases and another 64% cases it was satisfactory. After mobilization fistula was closed in double layer in 44% and in single layer in 6% cases. Martius graft was given in all patients. During operation bleeding was minimum in 78% cases and bleeding was more than average where blood transfusion needed in 22% cases (Table II).

**Table II** Perioperative events during VVF repair (n=50)

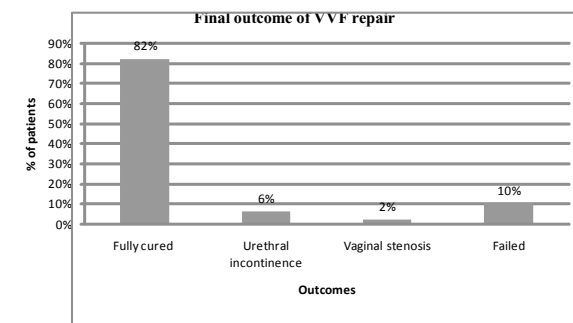
Parameters	Number of patient	Percentage (%)
Mobilization		
Not enough	9	18.0
Satisfactory	32	64.0
Excellent	9	18.0
Fistula closure		
Single layer	6	12.0
Double layer	44	88.0
Graft given		
Martius Graft	50	100.0
Per operative bleeding		
Average or minimum	39	78.0
Needed blood transfusion	11	22.0
Operation was		
Very difficult	9	18.0
Difficult	27	54.0
Easy	14	28.0

Postoperatively, patients were followed up till their hospital stays to notice any complications. Table III shows that In 8% cases catheter was blocked, urine leakage occurred in 6% cases. Among all patients 8% suffered from fever postoperatively there was vaginal discharge in 6% cases and UTI in 8% cases which was evidenced by urine culture. Two patients (4%) developed vulvalhaematoma, 20% patient developed scar pain and 8% patient developed infection at the graft site following repair of VVF by Martius graft.

**Table III** Post-operative complications

Parameters	Number of patient	Percentage (%)
Catheter blockage	4	8.0
Urine leakage at post-operative period	3	6.0
Fever	4	8.0
Vaginal discharge	3	6.0
Evidence of UTI by urine culture	4	8.0
Vulvalhaematoma	2	4.0
Scar pain	10	20.0
Infection at graft site	4	8.0

In the present series success rate of VVF repair reinforcement with Martius Graft was 82%. In another 6% of cases success was associated with urethral incontinence and in 2% cases with vaginal stenosis. Repair was failed in rest of the 5 (10%) cases (Figure 1). Causes of failure were very bad case (Gross scarring, large size) in 3 cases, postoperative catheter blockage in one case and infection in another case.



**Fig 1** Final outcome of operation in single attempt with Martius graft (n = 50)

## Discussion

The present study has been conducted in Fistula Centre of Chittagong Medical College Hospital, Chittagong to evaluate the outcome of repair of VVF by Martius Graft. In the current study a total of 50 cases were analyzed. The study demonstrated that when VVF whether simple or complex, was repaired by Martius graft, it had good success rate.

The mean age of the patients was 32.1 ( $\pm$ SD 8.1) years. Most of the respondents were from low socioeconomic class. This socio-demographic scenario is almost identical to other study in conducted in Bangladesh and other developing countries.<sup>10-12</sup> The alarming part is that majority of the cases occurred in middle age group and if not treated these women would have to spend a long part of their lives with this affliction, creating

social and psychological problems in addition to medical issues. Most of the fistula in present study was in midvaginal site (48%) followed by juxtracervical position (28%). Regarding type of the fistula vesicovaginal fistula was found to be the commonest. This finding is almost similar as observed by Begum et al and Sori et al.<sup>11,13</sup>

During repair of the fistula, labial fat graft (Modified Martius) was given in 100% patient and repair was successful in the majority of the cases. The grafts were given to cover and seal off the repair. It brings new blood supply and prevent cross union between bladder and vaginal mucosa. It also fills dead space and elevates the urethra against the symphysis and it function as a bolster in subsequent deliveries. These advantages reduce the failure rate associated with attempted closure of complicated fistula.<sup>14-17</sup>

Successful repair of fistula depends on many factors. Patient presenting with VVF may present with other associated problem which complicate the fistula and interfere with successful repair. Though rectovaginal fistula was excluded in this study even then 10% patients presented with associated vaginal stenosis and 6% with urethral avulsion. 4% patients had associated bladder mucosa prolapse and urethral stricture in 2% patients. These associated problems adversely affected successful repair which is similar to the study of Sori et al.<sup>13</sup>

In the present study fistula was cured with urethral incontinence in three (6%) patients and with vaginal stenosis in one patient. In remaining 10% patients, the condition did not improve. Interpretation of failure of operation, it was due to extensive scarring, large size of fistula, and impairment of drainage of urine due to postoperative catheter problem and due to infection. Majinge<sup>17</sup> routinely used MartiusBulbo-cavernosus graft to reinforce the repair and their success rate was 96% which is comparable to the result of present study which is 90%.

#### Limitations

Small number of cases with short follow-up period was the major limitations of the current study. Moreover, absence of a comparative group of VVF repair without Martius graft was another limitation.

#### Conclusion

In conclusion, success rate was high and few patients developed complication like vulvalhaematoma, scar pain and infection at the graft site following repair of VVF reinforced by Martius graft. So, if Martius graft (Labial fat) can be used in first time repair of simple and complex fistula the outcome would be better and from these better outcome patients as well as surgeons would be benefitted.

#### Recommendations

Prospective, randomized study, with or without the use of Martius interposition flap graft is required to validate the current study findings.

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#### Contribution of authors

NS- Conception, acquisition of data, drafting & final approval.

RB-Design, interpretation of data, critical revision & final approval.

FY-Data analysis, critical revision & final approval.

SK-Acquisition of data, data analysis, drafting & final approval.

NS-Acquisition of data, interpretation of data, critical revision & final approval.

RS-Data analysis, drafting & final approval.

KB-Data analysis, drafting & final approval.

#### Disclosure

The authors declared no competing interests.

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