Interposition flaps in vesicovaginal fistula repairs can optimize cure rate

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Abstract

Aim: To report the result of vesicovaginal fistula (VVF) repair using the transabdominal approach with flap interposition.

Materials and Methods: Between January 2004 and the end of 2011, operative reports data and medical records systems were reviewed for all VVF cases operated and followed in Urology Department. All patients had detailed history taking and physical exam followed by intravenous pyelograms or contrast CT abdomen and pelvis to rule out the presence of ureterovaginal fistulae. We utilized the infra-umbilical transabdominal approach and transpose an omental flap or peritoneal flap between the vaginal and bladder incisions in all cases.

Results: Twenty-six patients with an average age of 46 years were managed for VVF through transabdominal route with interposition of omental flap or peritoneal flap by a single surgeon. Twelve cases of VVF were secondary to lower segment cesarean section (LSCS) and twelve cases of VVF were secondary to lower segment cesarean section (LSCS) and 14 cases following hysterectomies. We had 16 complex VVF with 4 cases that failed the previous abdominal repair outside the hospital. More than 95% (25) of our patients were cured at the first attempt, with no recurrence at a mean follow-up of 28.6 (range 8-73) months.

Conclusion: Successful repair of VVF depends on the experience of the surgeon and adhering to basic surgical principles. Very high success rate was seen when flap interposition had been used.

Key Words: Incontinence, omental flap, vesicovaginal fistula

INTRODUCTION

Vesicovaginal fistula (VVF) is the abnormal communication between the vagina and the urinary bladder. It is mostly a problem of developing nations, arising as a devastating complication of poorly managed labor and gynecological surgeries.[1,2]

In VVF, the persistent odors and leakage of urine can lead to social cut-off, inability to perform religious activities, and even divorce in some cases which has psychological implications.[3]

The incidence of VVF following obstetrical causes in the developed countries is reported to be 3%-8%[4,5] as compared to 84%-97% in the developing nations.[6,7]

In the developed nations, the principal cause of VVF is considered to be gynecological surgical (mainly hysterectomies) trauma; however, illegal abortion, pelvic trauma, radiation necrosis, and radical pelvic surgery are the common causes.[1,6,9]

Different approaches are adopted for the repair of VVF with variable success rates. However, surgical repair is associated with a high cure rate if it is performed by an experienced surgeon.
Grafts and flaps have been interposed between the bladder and the vagina to improve healing and to reduce the chance of recurrence. Since the first surgical repair has the best curative chance, we use the flap in all cases. In the current study, we reviewed the causes of VVF in a tertiary care hospital where we receive referral from all over the country and report the result of VVF repair using the transabdominal approach with flap interposition.

**MATERIALS AND METHODS**

Between January 2004 and the end of 2011, operative reports data and medical records systems were reviewed for all VVF cases operated and followed in King Faisal Specialist Hospital and Research Center, which is the main tertiary care center in Saudi Arabia. A total of 26 patients were admitted with VVF from the clinic. All patients had detailed history including age, obstetrical history, etiologies of fistula, and history of any previous repair.

All patients were examined in the dorsal lithotomy position in the clinic, and local office cystoscopy was done to identify the size, site, bladder capacity, relationship to ureteric orifices, and number of fistula. Baseline intravenous pyelograms or contrast CT abdomen and pelvis were performed in all patients to rule out the presence of ureterovaginal fistulae.

Suprapubic, transvesical O’Connor technique was carried out under general anesthesia in dorsal lithotomy position in all cases. Intraoperative rigid cystoscopy was performed and temporary ureteral stents were used routinely in all cases. We performed minimal resection of the fistulous tract to simplify the procedure and minimize associated complications, including recurrence.

After exposure of healthy tissue at the wound margins, we closed the defect in a multilayer fashion, beginning with vaginal closure, then of the bladder mucosa, followed by bladder serosa.

We transposed an omental flap between the vaginal and bladder incisions to promote vascularizations, minimize opposition of suture lines, and reduce the risk of recurrence. In two cases, we were not able to use omental flap, so instead we used a pelvic peritoneal flap.

After surgery, the bladder was drained continuously for 10 days and cystogram was performed before catheter removal to document healing. Clinical follow-up in the clinic after 3 months was done for all patients to assess for any urine leak and to do bladder scan pre and post void.

**RESULTS**

Within the last 7 years, a total of 26 cases of VVF were managed in the Urology Department of King Faisal Specialist Hospital and Research Center through transabdominal route with interposition of omental flap or peritoneal flap by a single surgeon.

The age of patients treated for VVF ranged from 21 to 74 years, with a median of 34 years [Table 1].

A total of 4 cases were referred internally from Department of Gynecology and 22 cases referred from different regions of the kingdom. All VVF were secondary to iatrogenic causes; 12 cases were secondary to cesarean section and 14 cases following hysterectomies for benign and cancer causes. All cases failed conservative management using Foley catheter.

Our series comprised 16 complex VVF with four cases that failed the previous abdominal repair outside the hospital. We needed to re-implant one ureter since it was in close proximity to the fistula, and none of our cases required bladder augmentation. More than 95% of our patients were cured at the first attempt, with no recurrence at a mean follow-up of 28.6 (range 8-73) months.

**DISCUSSION**

Different types of urogenital fistula have been described; however, VVF is the most common type. The surgical approach to fistula is dependent on the fistula size, location, complexity, and the surgeon’s experience.

Surgeons involved in fistula repair should be skilled in both abdominal and vaginal approaches, and should have experience and versatility to decide the most appropriate procedure for each individual patient. In our study, suprapubic, transvesical O’Connor technique was used in all cases. Once we reach the fistula tract, instead of wide generous resection of fistula tract, we perform minimal resection of the fistulous tract until we produce fresh edges which can heal better with easy closure of the fistula. This has been clearly reported by Mourad et al.

Tissue interposition is always recommended in case of recurrent fistula and radiation-induced fistula; however, since the first

| Table 1: Age, etiology, and complexity |
|---------------------------------------|
| **Age (years)**                        | **Patients number (%)** |
| 20-30                                  | 4 (15)                  |
| 31-40                                  | 6 (23)                  |
| >40                                    | 16 (61)                 |
| **Etiology of VVF**                    |                          |
| Elective LSCS                          | 7 (26)                  |
| Emergent LSCS                          | 5 (19)                  |
| Abdominal hysterectomy                 | 14 (53)                 |
| **Complexity**                         |                          |
| Prior repair                           | 4 (25)                  |
| Large fistula >2 cm                    | 8 (50)                  |
| Multiple                               | 2 (12)                  |
| Trigonal                               | 1 (6)                   |
| Radiation                              | 1 (6)                   |

LSCS: Lower segment cesarean section, VVF: Vesicovaginal fistula
surgical repair has the best curative chance, we used the flap in all cases. Kiricuta and Goldstein in 1955 described the value of omental interposition in VVF repair.\textsuperscript{13}

Turner-Warwick in 1967 described the principles of omental mobilization taken off the stomach’s greater curvature with a pedicle, based on the right gastroepiploic artery.\textsuperscript{14}

Omentum was usually used in our study because of excellent vascularity and lymphatic drainage which can help in fistula closure and protect against infection.

With the use of infra-umbilical incision, we were able to get our omental flap with no added morbidity and with more than 95% cure rate in our study, and this should encourage the use of tissue interposition in the first surgical repair to optimize cure rate.

Gousse \textit{et al.} have shown similar result with a 100% success rate when interposition flap was used, as compared to 63% success rate when tissue flap was not used.\textsuperscript{15}

In two cases we were not able to use the omentum because of poor vascularity and inability of the free distal end to reach the deep pelvis. We used the pelvic peritoneum as a good alternative for omentum flap as described by Esin \textit{et al.} for the management of VVFs.\textsuperscript{16}

Many surgeons leave the catheter for 2 weeks; however, we leave the catheter for 10 days postoperatively and this has been shown recently to give a similar treatment outcome with a shorter duration of catheterization and a significant impact on reducing infection and cost.\textsuperscript{17}

Even though Tu Le \textit{et al.} had shown the potential success of early surgical treatment of vesicouterine fistula in selected patients, our data showed that waiting for at least 3 months helps in decreasing the morbidity of the procedure and increases the success rate.\textsuperscript{18} When we attempted early intervention in two cases we developed major morbidities. The surgery initially failed in one case; however, the fistula healed spontaneously using conservative management with Foley catheter and local estrogen in place after 6 months of follow-up. Major bleeding from the surrounding pelvic structures was encountered in one patient who required blood transfusion.

In our study, cure has been defined as the patient’s report of the absence of urinary leakage from the fistula at 3 months postoperatively. With the use of tissue interposition, the data of this study showed 95% success rate with less chance of recurrence which can help the patients to overcome the psychological implication of the fistula.

\section*{CONCLUSIONS}

VVF remains a condition with devastating physical, psychological, and social consequences for the patient. Successful repair depends on the experience of the surgeon and adhering to basic surgical principles. Very high success rate was seen when flap interposition had been used. We suggest that the O’Connor technique with omental or peritoneal flap be considered in the first attempt of repair of supratrigonal VVFs.

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