African Journal of Urology (2012) **18**, 175–179

Pan African Urological Surgeons' Association

African Journal of Urology

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Martius flap and anterior vaginal wall sling for correction of urethrovaginal fistula (UVF) associated with stress urinary incontinence (SUI) after vaginal delivery

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Received 18 May 2012; received in revised form 23 August 2012; accepted 9 October 2012

KEYWORDS
Urethrovaginal fistula;
SUI;
Martius flap;
Anterior vaginal wall sling;
Birth trauma

Abstract
Objective: To determine the efficacy, safety and urodynamic effects of the Martius flap and the anterior vaginal wall sling in treating post-birth trauma in the form of urethra-vaginal fistula (UVF) associated with stress urinary incontinence (SUI).
Patients and methods: Between July 2006 and August 2011, 19 patients underwent repair of UVF by interposition of a Martius flap and correction of associated SUI by a modified anterior vaginal wall sling. The procedure was carried out 3–17 (mean 7) months after post-birth trauma. Pre-operative evaluation consisted of history, voiding diary, physical examination, routine laboratory work-up, abdominopelvic ultrasonography, intravenous urography (IVU), and cystourethrography. The patients were followed up for a mean of 34 months. Follow-up included history, physical examination, urine analysis and pelvic ultrasonography for the assessment of residual urine. Urodynamic evaluation was performed at 3 months post-operatively.
Results: None of the patients developed recurrence of UVF. SUI was corrected in 16 patients (84%). In the post-operative period, 3 patients (16%) complained of an overactive bladder (OAB) with urodynamic detrusor overactivity (DO) and an obstructed flow. These problems were managed successfully using anticholinergics and urethral dilation. Three patients (16%) complained of mild SUI, but refused further management. Within 3 years following the intervention, 3 patients complained of a recurrence of SUI which was managed successfully by a rectus sheath sling.

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Peer review under responsibility of Pan African Urological Surgeons' Association.

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http://dx.doi.org/10.1016/j.afju.2012.10.004

Conclusions: Patients with a post-birth trauma in the form of UVF should be examined intra-operatively for the presence of associated SUI following correction of UVF. The use of the Martius flap and anterior vaginal wall sling in treating such patients is safe, efficient and reproducible. An anterior vaginal wall sling should be avoided in distal UVF to avoid recurrence of SUI.

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Introduction

Obstetric fistula is a complication of childbearing that has been relatively neglected. It usually occurs as a consequence of several days of obstructed labor without timely medical intervention. The impact of fistula on the patient's life may be disastrous [1].

It is important to understand the classification of obstetric fistulae. According to a review article published by Elkins, obstetric fistulae may be vesicocervical, juxtacervical, midvaginal vesicovaginal, suburethral, vesicovaginal or urethrovaginal [2].

An obstetric fistula results from tissue ischemia and subsequent necrosis during difficult labor. During normal labor, the anterior vaginal wall, bladder base and urethra are compressed between the fetal head and the pubic bone. If there is prolonged obstructed labor, the intervening soft tissues slough off within 3–10 days postpartum due to ischemia [3]. The obstetric fistula is a field injury with a large defect surrounded by damaged, ischemic tissue which, when occurring at the urethra, may lead to SUI due to weakening of the sphincter mechanism [4].

In patients with UVF, the defect may be proximal or (rarely) distal to the external sphincter which may or may not lead to incontinence. If the fistula is located proximal to the sphincter, total incontinence may mask associated SUI which should be searched for intra-operatively and corrected in the same session [5]. This prevents missing of masked associated SUI and the need of reoperation in an already ischemic field.

An organic suburethral sling procedure with or without an interposition flap is a useful technique at the time of a transvaginal approach for a UVF associated with SUI, especially, if fistula repair involves the bladder neck and proximal urethra [5].

The use of synthetic slings is unsafe in patients with SUI who have a concurrent UVF, as synthetic material may increase the risk of adverse effects. The AUA guidelines panel suggests that the use of autologous fascia and alternative biologic slings be considered in such patients [6].

In this study, care was taken to detect associated SUI intraoperatively after closure of the fistula. Associated SUI was corrected using an anterior vaginal wall sling rather than an anterior rectus sheath in order to decrease morbidity. To our knowledge, this approach had not been tried before, possibly for fear of encouraging recurrence of SUI by using already weak tissue.

Patients and methods

Preoperative evaluation

Between July 2006 and August 2011, 19 patients underwent correction of post-birth trauma in the form of UVF and correction of associated SUI, utilizing the procedure described below.

The patients were evaluated by recording their medical history with an emphasis on the mode of delivery, onset and type of incontinence, as well as previous trials of treatment. Three patients were operated on at Bani Swaif University Hospital, Egypt, while the other 16 patients were operated on at Balbala Hospital in Djibouti. The procedure was carried out 3–17 (mean 7) months after birth trauma. All the patients had had a difficult prolonged normal labor. Evaluation included history, voiding diary, examination in Trendelenburg position (trying to detect the site, size and number of fistulae, the condition of local tissues, and the presence of pelvic organ prolapse (POP)). The fistulous site ranged from 5 to 20 mm distal to the bladder neck. Investigations included routine laboratory investigations, abdominopelvic ultrasonography, IVU (to exclude associated vesicovaginal fistula), cystourethrography, and urodynamic studies (for the 3 patients without continuous leakage). Cystoscopy was done intra-operatively to assess the fistula, the presence of other fistulae, and the bladder neck. Successful surgery was defined as one or no pad usage per day with one or no leakage episode per day and mild or no leakage on stress test.

Surgical technique

The patient was placed in a high, dorsal lithotomy position. The lower abdomen and genital area were prepared and draped in a sterile fashion. The labia were retracted laterally with stay sutures. If cystoscopy was free, a 16F Foley catheter was inserted per urethra and the bladder was emptied. A weighted vaginal speculum was used for exposure. The fistula was probed with a ureteric catheter (if it was small) (Fig. 1). An Allis clamp was used to grasp the anterior vaginal wall around the fistulous tract. The fistulous tract around the ureteric catheter was dissected until the urethra was reached (Fig. 1). The fistulous tract was then excised and the urethra closed longitudinally with Vicryl 4/0 sutures (Fig. 2). A Martius flap was created to cover the urethral suture line (Fig. 3). The anterior vaginal wall was closed by continuous Vicryl 3-0 sutures. Patients who had complained of total incontinence pre-operatively were asked to cough in order to demonstrate associated masked SUI.

In proximal fistulae, a modified anterior vaginal wall sling of Raz was performed [7] utilizing a separate anterior vaginal wall incision, while in distal fistulae, the local vaginal wall covering the fistula was used.

The vaginal sling was a rectangle of anterior vaginal wall that was undermined to free the edges, but was not completely freed from its local tissues. The four corners of the rectangle were anchored by Prolene 0 sutures to be fixed retropubically in the anterior rectus sheath. A vaginal pack was used for 24 h.

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