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Lateral-based Anterior Vaginal Wall Flap in the Treatment of Female Urethral Stricture: Efficacy and Safety

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Abstract

Background: Female urethral stricture is a rare condition. Different types of urethroplasty have been described. However, high quality studies are sparse. The most common technique used—the Blandy's technique—has resulted in our cases in a retrusive meatus and an inward urinary stream.
Objective: To show the efficacy and safety of an alternative vaginal wall flap urethroplasty.
Design, setting, and participants: A cross-sectional observational study was undertaken in a single University Hospital. Nine female patients previously diagnosed with urethral stricture at our institution underwent open surgery from 1993 to 2015. They were contacted and agreed to undergo a medical examination.
Surgical procedure: A ventral lateral-based anterior vaginal wall flap urethroplasty inspired by the Orandi technique for male urethroplasty was performed.
Measurements: A chart review was performed.
Results and limitations: The mean age was 56 yr (41–78 yr). The mean follow-up was 80.7 mo (12–198). All patients had relief of symptoms. The meatus of all patients stayed in an orthotopic position without any impact on the direction of the urinary stream. The average caliber of the urethra increased from 10.8 Fr (6–18 Fr) to ≥20 Fr. Peak flow improved from a mean of 6.8 ml/s (3–11 ml/s) to 21 ml/s (14–35 ml/s). No patient developed stricture recurrence or de novo stress urinary incontinence. There were no other immediate or delayed complications. All patients achieved a better score on the Patient Global Impression of Improvement questionnaire.
Conclusions: Our study, with the same limitations that the few studies published in this field had, that is the few patients included, demonstrates that lateral anterior vaginal wall flap urethroplasty is an effective technique, offering durable results without apparent complications.
Patient summary: We studied an alternative surgical technique for the treatment of female urethral stricture. We conclude that it is safe and effective with no apparent complications and good long-term results.

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1. Introduction

Female urethral stricture (FUS) is an uncommon condition. Although its true incidence is largely unknown, it appears to be relatively low [1].

There is a certain controversy about its etiology, which is largely due to the rarity of the disease. Multiple factors, including infection, trauma, instrumentation, and prior urethral surgery may be implicated.

There is no standardized definition or diagnostic criteria for urethral stricture in women. The majority of published studies perform a multitude of tests, and no author relies on just one investigative modality. Therefore, making an accurate diagnosis requires a high index of suspicion because the presentation is often nonspecific.

Once FUS is diagnosed, there are two main treatment methods: (1) urethral dilatation, and (2) urethroplasty augmentation. In the case of the latter, this includes vaginal and labial flap and graft urethroplasty, as well as oral graft urethroplasty [2–9]. However, there are no indications as to which procedure to use for each case, and therefore it is usually dependent on the surgeon's expertise and personal preference.

The success rates of the different procedures have also been poorly described in the literature, and its follow-up is usually of short duration. In general, meaningful outcome procedures have not been used [10].

One of the most commonly used treatment methods is the Blandy technique, popularized by McGuire et al [11]. This technique implies that the U-shaped vaginal wall flap is inverted onto itself, making it a relatively simple procedure with minimal morbidity. However, in our initial experience, the technique results in a retrusive meatus and an inward urinary stream.

The aim of this study is to present our experience on the etiopathogenesis, diagnosis, and surgical management with an alternative vaginal flap technique in a group of women diagnosed with FUS at our institution, analyzing its safety, effectiveness, and long-term outcome.

2. Patients and methods

2.1. Study population

A cross-sectional observational study was performed in a single University Hospital. Nine female patients were diagnosed with urethral stricture at our institution from 1999 to 2015, and had undergone open surgery. These patients were contacted and agreed to undergo a follow-up medical examination, signing an informed consent.

2.2. Preoperative evaluation

A standard preoperative evaluation was performed in all the patients, including medical history, physical examination, urine culture, flowmetry, postvoid residual urine measurement, urethral calibration, and voiding cystourethrography. Urodynamics and cystoscopy was performed in cases where urethral caliber was superior to 14 Fr.

2.3. Surgical procedure

A ventral lateral-based anterior vaginal wall flap urethroplasty was performed, based on Orandi's technique for male strictures [12]. After intradural anesthesia, the patient was placed in a dorsal lithotomy position. Then, urethral catheterization with a Foley 8-Fr catheter was performed, or with a guidewire when the former was not possible. A midline anterior vaginal wall incision was then carried out (Fig. 1A), followed by its mobilization. The side where the flap was to be taken from was dissected, preserving as much vascularization as possible. Then, the urethra was incised ventrally from the meatus to the point where the stricture was completely open (Fig. 1B).

A rectangular-shaped piece of vaginal wall was then selected, depending on the length and caliber of the stricture (Fig. 1C). After mobilizing the outer external flap border, where a wide axial vascular pedicle remains, the vaginal flap was then sutured to the margins of the urethrotomy defect with an interrupted 3-0 polyglactin absorbable suture. The inner vaginal flap was sutured to the closest urethral margin (Fig. 1D). The outer vaginal edge was turned around and sutured to the contralateral edge (Fig. 1E). In cases where the meatus was not strictured, the vaginal flap was carried down just to this limit. Afterwards, the meatus was closed, remaining in an orthotopic position. Finally, the vaginal mucosa was attached with a 2-0 Vicryl-rapid suture (Fig. 1F). The patient was discharged from hospital within 24 h. Antibiotics were given to the patients for 5 d and a Foley catheter was maintained for 3 wk. Intravaginal estrogens were applied preoperatively to two postmenopausal patients for 3 mo.

2.4. Postoperative follow-up

During the last postoperative review, symptom assessment, physical examination, flowmetry, postvoid residual urine measurement, and urethral calibration were performed. Personal assessment of the success of the surgery was performed using the Perception Global Impression of Improvement questionnaire (PGI-I) during this visit. The PGI-I questionnaire is a self-administered questionnaire based on an analogue scale with seven questions regarding the current status compared with that prior to treatment, ranging from excellent to poor.

Complications of the procedure was assessed from the patients' medical records and directly from the patient during the last visit, and classified according to the Clavien-Dindo classification [13].

2.5. Data analysis

A descriptive statistical assay was performed. A nonparametric test (sign rank test) was used to compare the peak flow before and after surgery. The effect of the surgical procedure was determined by median differences and ratios.

3. Results

Eight women agreed to undergo a medical review. One woman had died 5 yr after the urethroplasty due to an unrelated disease. This patient had performed a clinical review 2 mo before death. The mean age at the time of surgery of the studied group was 56 yr (41–78 yr). The mean follow-up was 80.77 mo (12–198 mo).

The average time of onset of symptoms was 12 yr (3–30 yr) prior to surgery. The symptoms appeared in four of the patients after a bladder catheterization (three from surgery and one after complications while giving birth). The remaining patients manifested FUS for unknown reasons, although two patients described having complicated labors.

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