# The Surgical Management of Obstructive Stents Used for Urethral Strictures

**Abdelwahab A. Elkassaby, Ahmed M. Al-Kandari and Ahmed A. Shokeir***

*From the Department of Urology, Ain Shams University (AAE), Cairo and Urology and Nephrology Center (AAS), Mansoura, Egypt, and Department of Surgery (Urology), Adan Hospital, Kuwait University (AMAK), Safat, Kuwait*

**Purpose:** We present our referral experience with patients who had extensive urethral obstruction following UroLume® insertion and were treated with urethroplasty.

**Materials and Methods:** We retrospectively analyzed the records of 13 men with urethral stricture who experienced recurrent obstruction following placement of a UroLume endoprosthesis. In all patients several attempts at urethral dilation and optical urethrotomy failed to overcome the obstruction. Complete excision of the obstructed urethra containing the stent with the surrounding periurethral fibrosis was done in all patients. In 12 patients a 1-stage bipedicled penile island tubularized flap was used to bridge the urethral defect. In 1 patient 1-stage urethroplasty was performed and he is awaiting stage 2. Followup assessment included urine flow, post-void residual urine measurement, retrograde urethrogram and urethroscopy at different intervals.

**Results:** Of the 12 patients who underwent complete treatment 1 had a short segment stricture at the site of the distal anastomosis 3 months after catheter removal, which was successfully managed by internal urethrotomy. He was doing well at the 12-month followup. In 11 patients a successful outcome was noted immediately after catheter removal and it was maintained at a mean followup of 1.8 years (range 1 to 4).

**Conclusions:** Complete excision of the obstructed urethra containing the UroLume stent with the surrounding periurethral fibrosis is an important first step in reconstruction. Subsequent use of a 1-stage bipedicled penile island tubularized flap resulted in excellent long-term results. In a small subset of cases delayed stage 2 repair after skin inlay is a valuable option.

*Key Words: urethra, stents, urethral obstruction, prostheses and implants, urethral stricture*

Treatment for complex and recurring urethral strictures is a hotly debated topic among urologists. Some patients, especially when young and sexually active, find it difficult to accept self-catheterization or periodical dilation. Introduction of the UroLume prosthesis for recurring and nonresponsive urethral strictures has opened a new frontier in the minimally invasive treatment of posterior urethral stricture.[1] The stent was developed for the endovascular prevention of recurrent arterial narrowing after balloon angioplasty. Following experimental use of this device in dogs Milroy et al reported early results in the first 8 patients.[2] The application of UroLume prostheses was initially reserved for patients older than 50 years who were unfit or who refused bulbar urethroplasty. Initial results were encouraging.[1–4] Therefore, indications for the UroLume were extended to include younger, fit patients with urethral strictures to replace repeat internal urethrotomies and more complicated urethroplasty operations.[4] Nevertheless, long-term results were not satisfactory and more recent studies showed a high complication rate.[5–8]

We present our referral experience with 13 patients who experienced significant urethral obstruction following UroLume insertion with failed multiple attempts at endoscopic treatment by the referring urologists. Upon arrival to us the degree and extent of narrowing were so severe that we elected complete surgical urethral reconstruction as definitive treatment. To our knowledge the current report is the largest ever reported in the urological literature on reconstructive urethral surgery for obstructive UroLume stents applied for urethral strictures.

## MATERIALS AND METHODS

We retrospectively analyzed the records of 13 men with urethral stricture who experienced recurrent obstruction following placement of a UroLume endoprosthesis from March 2001 to August 2005. All patients were referred to 1 urologist (AAE) for persistent or recurrent symptoms of voiding dysfunction following insertion of the primary UroLume by a different urologist.

### Patients

Mean patient age at stent insertion was 36 years (range 25 to 57). Patients underwent a mean of 2.1 previous treatments (range 2 to 4) for urethral stricture. All men previously underwent urethrotomy and/or urethral dilation, and 1 underwent previous anastomotic urethroplasty to repair posttraumatic disruption of the posterior urethra. The anastomotic site was a seat of obstruction that was unresponsive to repeat attempts at internal urethrotomy. The most common cause of urethral stricture was iatrogenic, arising after

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* Correspondence: Urology and Nephrology Center, Mansoura University, Mansoura, Egypt (telephone: (20) (50-2262222); FAX: (20) (50-2263717); e-mail: ahmedshokeir@hotmail.com).



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*Urethral stricture etiology and anatomical site*

| | No. Pts. (%) |
|---|---|
| Etiology: | |
| Iatrogenic | 7 (53) |
| Idiopathic | 1 (8) |
| Traumatic | 3 (23) |
| Infectious | 1 (8) |
| Congenital | 1 (8) |
| Anatomical site: | |
| Bulbar | 12 (92) |
| Bulbomembranous | 1 (8) |

endoscopic surgery or after an indwelling catheter, and most strictures were bulbar in position (see table). The interval between symptoms and initial UroLume insertion was 2 to 18 months. The length of the preexisting stricture before the UroLume was initially placed was not known.

All patients had stent obstruction due to recurrent stricture. In all patients several attempts at urethral dilation and optical urethrotomy failed to overcome the obstruction. They underwent a mean of 2.6 previous treatments (range 2 to 5) for stent obstruction before referral to us. Upon presentation to us 10 patients had severe obstructive voiding symptoms, as confirmed by a marked decrease in the maximum flow rate (mean ± SD 4.8 ± 3.2 ml per second) and increased post-void residual urine (mean 120 ± 30 ml). Three patients were in urinary retention and required suprapubic catheter insertion.

The interval at which symptoms developed after UroLume insertion was 8 to 18 months. At this time we began dealing with the obstructed UroLume. In all patients retrograde urethrogram confirmed significant urethral obstruction (fig. 1). Stricture location was bulbar in 12 patients and bulbomembranous in 1. The strictures were 3 to 5 cm long.

**Surgical Technique**

Each patient received broad-spectrum antibiotic coverage preoperatively. The procedure was done using spinal anesthesia in 10 cases and general anesthesia in 3. The patient was placed in the lithotomy position and a midline perineal incision with λ lower extensions was made. A significant amount of fibrosis was noted. After circumferential dissection of the bulbar urethra excision of the obstructed urethra, including the stent, was performed and sent for histopathological examination. The 2 ends of the urethra were widely spatulated for a minimum of 1 cm at either end. Based on the length of the urethral defect and the available nonhairy suite ventral penile skin 1-stage repair was feasible in 12 cases. This was done using a bipedicled ventral nonhairy suite penile skin flap measuring an average of 3 × 6 to 8 cm, which was mobilized down with long penile and dartos pedicles and then tubularized over a 24Fr urethral catheter (fig. 2). We used 5-zero polyglactin sutures to close the tube and then anastomosed to the 2 spatulated urethral ends.

An 18Fr silicon urethral catheter was inserted at the end of the procedure and a small perineal vacuum drain was left in the area. In all patients a 16F suprapubic and a urethral catheter were placed, and the dressing was applied. In a case of long bulbar urethral stricture post-posterior urethral repair we elected a staged approach due to the increased length of the urethral defect to be bridged (8 cm) and the nonavailability of enough nonhairy suite penile skin. In this case stage 1 was the same as described.

A ventral nonhairy penile island flap was then laid down as an inlay between the roof of the 2 urethral ends over the ventral aspect of the corporeal bodies and sutured to the adjacent scrotal and perineal skin edges. This patient awaits stage 2 repair 6 months after stage 1. The urethral and suprapubic catheters were maintained for 3 weeks. Pericatheter urethrogram was done and confirmed no extravasation in the 12 cases that were completed.

**Followup**

Followup assessment included urine flow and post-void residual urine measurement by ultrasound every 3 months for the first year and once yearly thereafter. Retrograde urethrogram was performed in all cases at 3 months postoper-

FIG. 1. Preoperative urethrogram shows stent and degree of narrowing.

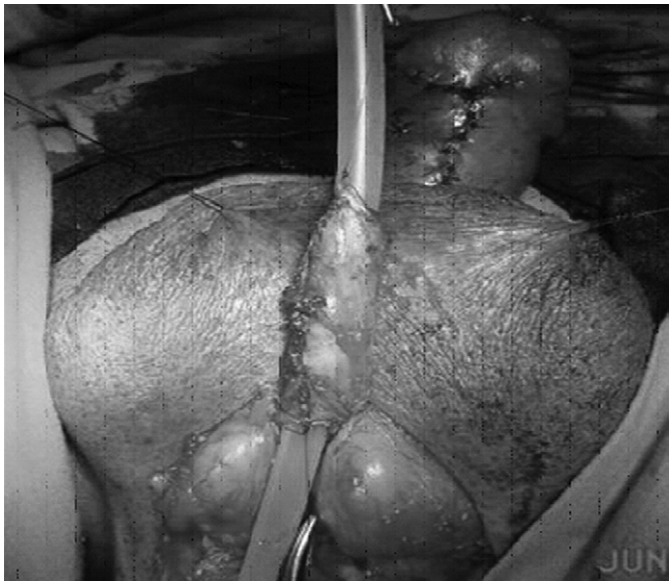

FIG. 2. Tubularized ventral penile island flap used to bridge urethral gap.