

*Research Article***Effect of the patient age, cause of stricture, stricture length and previous treatment on the success rate of penile urethroplasty**

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Abstract

Objective: To evaluate the effect of patient age, cause of stricture, stricture length and previous treatment on the success rate of penile urethroplasty. **Patients and methods:** 28 adult patients with penile urethral stricture were included in our study. Patients were randomised to perform either ventral onlay local penile skin flap or dorso-lateral onlay buccal mucosa graft urethroplasty. Successful treatment outcome was defined as no further treatment of the urethral stricture required after urethroplasty and peak flow rate > 15 ml/s. We studied the effect of patient age, cause of stricture, stricture length and previous treatment on the success rate of penile urethroplasty. **Results:** Patients aged >60 years had a success rate (5 of 6 patients (83.3%)) similar to younger patients (12 of 13 in patients 14 to 39 years (92.3%) and 8 of 9 (88.9%) in patients 40 to 59 years). Strictures due to inflammatory cause show lower success rate (80%) compared to post catheterization strictures (87.5%), idiopathic strictures (100%) and strictures due to iatrogenic trauma (100%). Urethral strictures longer than 80 mm was 72.7% (8 of 11 cases) compared to 100% success rate for strictures less than 80 mm. The success rate was 12 of 13 patients (92.3%) in patients who had not had a previous treatment, compared to 13 of 14 patients (92.9%) in those treated with previous urethrotomy, whereas there was only one patient who had a previous urethroplasty which considered failure due to occurrence of long urethral stricture. **Conclusion:** The success rate of urethroplasty is usually not affected by patient age, but it may be affected by the etiology of the stricture, the stricture length and previous urethroplasty.

Key Words: patient age, stricture length, penile urethroplasty

Introduction

The male urethra can be divided into two parts: the posterior urethra, including the membranous and prostatic urethra, and the anterior urethra. The anterior urethra classically is divided into the bulbar and the penile urethra. Basically, the term urethral stricture refers to anterior urethral disease by consensus of the World Health Organization conference. In contrast, posterior urethral "strictures" are not included in the common definition of urethral stricture. Distraction defects are processes of the membranous urethra associated with pelvic fracture. Other narrowings of the posterior urethra are termed urethral contractures or stenosis.⁽¹⁾

Urethral catheterization or instrumentation, blunt trauma, lichen sclerosus (LS) and sexually transmitted diseases are the most frequent causes of penile strictures.⁽²⁾

Various surgical techniques are currently being used to repair penile urethral strictures with the goal of reducing morbidity and obtaining the best outcome with few complications.^(3,4)

The urologist is thus requested to be familiar with the use of various surgical techniques to deal with any condition of the urethra that might emerge at the time of surgery. Urethral reconstruction is a continuing challenge and excellent results can be

obtained with today's techniques, with single-stage repairs on the increase and continued improvements in patient outcome⁽⁵⁾.

Methodology

This study was performed prospectively on patients with long segment penile urethral stricture from October 2014 to August 2017 at urology department, Kasr Alaini hospital and Minia university urology and nephrology hospital. Twenty eight patients with long segment penile urethral stricture were randomized to receive either dorso-lateral onlay buccal mucosa urethroplasty (14) or ventral onlay local penile skin flap urethroplasty (14). Patients with lichen sclerosus and those with history of hypospadias repair were excluded.

Pre-operative evaluation included proper clinical history, physical examination, full preoperative laboratory investigations, urine analysis and urine culture, pelvi- abdominal ultrasonography for assessment of residual urine and upper tract affection, uroflowmetry, retrograde urethrography, voiding cysto-urethrography and urethroscopy when needed. For Buccal mucosal graft group, Three days prior to surgery, the patient should repeatedly cleanse the mouth with a chlorhexidine mouth wash and continue to do so for the 3 days following surgery.

We randomized patients to undergo either buccal mucosa dorso-lateral onlay graft or ventral onlay local penile skin flap urethroplasty.

In both groups, the patient ambulates on the first postoperative day, and is discharged on the first or second postoperative day. In buccal mucosa graft group; the patient initially consumes a clear liquid diet and ice cream before advancing to soft diet then regular diet. All patients are maintained on oral antibiotics until the catheter is removed, four weeks later, pericatheter urethrography is done and the catheter is removed if no extravasation detected, patients with wound infection at the level of suture line had extended catheterization for 1 or 2 more weeks. Uroflowmetry, retrograde urethrography and micturating cysto-

urethrography were done after 3&6 months, or earlier if obstructive symptoms arise. The follow up thereafter included symptomatic assessment and uroflowmetry every 6 months. Urethrography was done only if symptoms or uroflowmetry suggested recurrent stricture.

Successful treatment outcome was defined as no further treatment of the urethral stricture required after urethroplasty and peak flow rate > 15 ml/s. We studied the effect of patient age, cause of stricture, stricture length and previous treatment on the success rate of penile urethroplasty.

Results

A total of 28 patients presented with long segment penile urethral stricture were enrolled in our study. 14 patients underwent buccal mucosal grafting (BMG) and 14 patients underwent local penile flap (LPF) urethral reconstruction, with mean age of 37.1 ± 17.4 years for buccal mucosal graft group and 47.4 ± 17.9 years for local penile skin flap group. The mean follow up period was 16.5 ± 7.3 months for BMG group, and 13.1 ± 5.4 months for LPF group.

In general, the etiology of strictures was inflammatory in 35.7%, idiopathic in 32.1%, post catheterization in 28.6% and iatrogenic trauma in 3.6%.

The median urethral stricture length was 57.5mm in BMG group (range 30-140 mm) and 70 mm in LPF group (range 20-110 mm) when assessed preoperatively using combined ascending & voiding urethrography. However, discrepancy in stricture size was noticed, when the stricture length was assessed intraoperatively. The intra-operative median urethral stricture length was 67.5 mm in BMG group (range 40-140 mm) and 85 mm in LPF group (range 20-120 mm).

Regarding prior DVIU five patients (35.7%) in BMG group and nine patients (64.3%) in the LPF group had history of prior DVIU. One patient in LPF group had history of previous urethroplasty with 12 cm recurrent urethral stricture managed with McAninch local penile flap.

Patients aged >60 years had a success rate (5 of 6 patients (83.3%)) similar to younger patients (12 of 13 in patients 14 to 39 years (92.3%) and 8 of 9 (88.9%) in patients 40 to 59 years). Strictures due to inflammatory cause show lower success rate (80%) compared to post catheterization strictures (87.5%), idiopathic strictures (100%) and strictures due to iatrogenic trauma (100%). Urethral strictures longer than 80 mm was 72.7% (8 of 11 cases) compared to 100% success rate for strictures less than 80 mm. The success rate was 12 of 13 patients (92.3%) in patients who had not had a previous treatment, compared to 13 of 14 patients (92.9%) in those treated with previous urethrotomy, whereas there was only one patient who had a previous urethroplasty which considered failure due to occurrence of long urethral stricture.

Discussion

Lumen N and colleagues carried out a study to detect the current etiology of urethral stricture disease in the developed world. They reported that the most important causes of stricture were idiopathic, transurethral resection, urethral catheterization, pelvic fracture and hypospadias surgery, and that iatrogenic causes account for about half of strictures managed with urethroplasty in the developed world, and in about 1 out of 3 cases, no obvious cause could be detected.⁽⁶⁾ In our study, the most frequent cause of urethral strictures was inflammatory in 35.7% of patients, with a positive history of UTI and positive cultures. The second most common etiology was idiopathic and was seen in 32.1% of patients. History of long term indwelling catheters was reported in 28.6% of patients and iatrogenic trauma was recorded in 3.6% of patients.

Dubey and colleagues reported that the mean stricture length in their study was comparable between the 2 groups, as the mean stricture length in the BMG group was 5.6 cm (range 4 to 15) and in the LPF group was 6.0 cm (range 4 to 12).⁽⁷⁾ In our study, we assessed the stricture length preoperatively using combined RUG and VCUG, the mean urethral stricture length in BMG group was 57.5 mm (range 30-140 mm) and in LPF group was 70 mm (range

20-110 mm). It is important to mention that we carried out a proper urethrography, as described in the review of literature, aiming at accurate assessment of the stricture length, as inappropriate technique may result in faulty stricture length detection. Despite of that, when the stricture length was detected intra-operative, we found a discrepancy in stricture length varying between 10 to 20%. So, we believed that intra-operative assessment is the most reliable method for assessing the length of urethral stricture. This is in concordance with that work published by Nitin Gupta and colleagues comparing the retrograde urethrography (RUG) and the sonourethrography (SUG) concluding that RUG underestimated the length of the stricture compared to that measured on SUG which was closer to that measured during the surgery.⁽⁸⁾ Therefore, we claims that RUG is a useful procedure to assess the stricture site and length, but data should be interpreted carefully and the reconstructive urologist must be experienced and have enough tools to deal with any intraoperative surprises.

Barbagli and colleagues, in a study comparing the results of a one-stage penile flap or graft urethroplasty, looked over the relationship between stricture length and the success rate of urethroplasty, they found that the success rate of urethroplasty according to stricture length was controversial, as of 13 strictures longer than 6 cm, 11 were successfully repaired, on the other hand, of ten strictures that were 3-4 cm length only five were successful.⁽⁹⁾ Also, Kulkarni et al., reported that the stricture length has no effect on the success rate, claiming that other factors (possibly vascular and neurogenic urethral injuries) might have an important role in stricture recurrence.⁽¹⁰⁾ On the other side, Raj Kumar Mathur et al., in a study evaluating single-stage penile skin flap urethroplasty for treatment of long-segment urethral strictures found that strictures longer than 70 mm were associated with a higher risk of failure.⁽¹¹⁾ In our study, As regard the relationship between stricture length and the success rate of urethroplasty, long-segment strictures >80 mm (intraoperative length) were associated with a higher risk

of failure, as the success rate of urethral strictures longer than 80 mm was 72.7% (8 of 11 cases) compared to 100% success rate for strictures less than 80 mm.

Guido Barbagli et al., analyzed their results according to the factors reported as influencing the success rate of urethroplasty procedures in general including patient age, stricture cause, stricture length and previous treatments. Their results reported that the patient age had no effect on the success rate of urethroplasty, as patients aged >70 years showed higher success rate (six of seven) than younger patients (79% in patients 15 to 49 years or 71% in patients 50 to 69 years). Evaluating the success rate of urethroplasty in relation to the cause of the stricture showed that the only strictures which had low success rate were those with unknown cause (63%), but this group represented a relatively large group of patients (19 patients). In patients who had not had a previous treatment, the success rate was nine of 11, whereas in patients who performed previous urethroplasty, the success rate was lower (two of three), but in those who had history of urethrotomy before urethroplasty it was not as low as expected (10 of 11).⁽⁹⁾

In our study, our results showed that patient age had no effect on the success rate, suggesting that one-stage penile urethroplasty could be provided for patients at any age, as patients aged >60 years had a success rate (5 of 6 patients (83.3%)) similar to younger patients (12 of 13 in patients 14 to 39 years (92.3%) and 8 of 9 (88.9%) in patients 40 to 59 years). Evaluating the success rate of urethroplasty according to the cause of the stricture showed that strictures due to inflammatory cause show lower success rate (80%) compared to post catheterization strictures (87.5%), idiopathic strictures (100%) and strictures due to iatrogenic trauma (100%). The success rate was 12 of 13 patients (92.3%) in patients who had not had a previous treatment, compared to those treated with previous urethrotomy (13 of 14 patients (92.9%)) it was not as low as expected for patients with history of previous DVIU, whereas there was only

one patient who had a previous urethroplasty which considered failure due to occurrence of long urethral stricture in a patient with 12cm recurrent urethral stricture managed with McAninch local penile flap.

Conclusion

On an intermediate term follow up, the success rate of urethroplasty is usually not affected by patient age, but it may be affected by the etiology of the stricture, the stricture length and previous urethroplasty. Further studies with higher sample sizes & longer term follow-up periods may be required to determine subtle effect of these factors on the surgical outcome and complication rate of penile urethroplasty.

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