

Dimitris Costi¹, Guido Barbagli², Sofia Balò,² Massimo Lazzeri²

Athina Mavrou¹

Reconstructive Urethral Surgery for Anterior Urethral Strictures: a Preliminary Experience in a Referral Single Center in Cyprus.

¹ Evangelistria Medical Centre, Nicosia, Cyprus

² Centro Chirurgico Toscano, Arezzo, Italy

Corresponding author:

Dimitris Costi, M.D.

Evangelistria Medical Centre, 1, M. Gergallia Str,

1095 Nicosia, Cyprus

Tel. 22 410 100; FAX 22 670 363

Email: dimcosti@gmail.com (Dr. Dimitris Costi)

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SUMMARY

INTRODUCTION: We report our preliminary experience and the results of different types of urethroplasties to repair anterior urethral stricture in a referral single center in Cyprus.

MATERIALS AND METHODS: We performed a retrospective descriptive analysis of a cohort of patients who underwent anterior urethroplasty between October 2012 and October 2014 at the Center for Reconstructive Urethral Surgery in Nicosia, Cyprus. Inclusion criteria included patients who underwent anterior one-stage or two-stage urethroplasty. Patients with posterior urethral strictures or incomplete clinical records at followup analysis were excluded from study. The primary outcome of the study postoperative failure-free survival in the overall population. The objective outcome was considered a failure when any post-operative instrumentation was needed, including dilation.

RESULTS: A total of 18 patients were considered eligible for review according to the inclusion/exclusion criteria. Median patient age was 40 years (range 22-70). All patients underwent one-stage repair using oral mucosal graft. With a median follow-up of 11 months (range 1 to 25), no patients develop recurrence of stricture.

CONCLUSIONS: One-stage urethroplasty with oral mucosa provide excellent results in a limited series of patients showing different penile and bulbar stricture diseases.

INTRODUCTION

Reconstructive urethral surgery has greatly improved in safety, variety and effectiveness during the last 3 decades¹. Although endoscopic treatment can transiently improve urinary flow, open urethroplasty is now regarded as the gold-standard treatment for anterior and posterior urethral strictures². Numerous surgical techniques have been suggested to repair anterior urethral stricture and there the long-term results with more than 7-10 years of followup in large series of patients are available in the literature³⁻⁶.

We report our preliminary experience and the results of different types of urethroplasties to repair anterior urethral stricture in a referral single center in Cyprus.

MATERIALS AND METHODS

We performed a retrospective descriptive analysis of a cohort of patients who underwent anterior urethroplasty between October 2012 and October 2014 at the Center for Reconstructive Urethral

Surgery in Nicosia, Cyprus. The cutoff date for the analysis was December 31, 2014. The last followup for each patient reflects the last point of contact with the office. Followup was calculated for each patient based on time from surgery to the last office followup. The study was approved by the institutional review board. Inclusion criteria included patients who underwent anterior one-stage or two-stage urethroplasty. Patients with posterior urethral strictures or incomplete clinical records at followup analysis were excluded from study. The primary outcome of the study postoperative failure-free survival in the overall population. Preoperative evaluation included clinical history, physical examination, urine culture, residual urine measurement, uroflowmetry, urethrography, urethral ultrasound and urethroscopy. Patients with meatal/navicularis strictures underwent calibration of the meatus using progressive Nelaton catheters 8,10,12 F. The objective outcome was considered a failure when any post-operative instrumentation was needed, including dilation. Uroflowmetry and urine culture were repeated every 4 months in the first year and annually thereafter. When symptoms of decreased force of stream were present and the uroflowmetry was less than 12 ml per second, urethrography, urethral ultrasound, urethroscopy and meatal calibration were repeated. In all patients, the oral mucosa was harvested from the cheek according to our current surgical technique⁷.

SURGICAL TECHNIQUES

Combined graft-flap urethroplasty

The urethral mucosa involved in the disease was completely removed from the meatus to the tip of the glans. A graft of oral mucosa was sutured to substitute the urethral mucosa. Rectangular longitudinal flap was designed on the ventral surface of the penile skin and sutured over the oral graft. A Foley 12 Fr. silicone catheter was left in place for 2 weeks.

Asopa's urethroplasty

The urethra was longitudinally opened and the urethral plate was fully exposed. A Snodgrass's incision was made on the urethral plate to create a wide window. The oral graft was sutured to the window on the urethral plate and the urethral was tubularized over 12 Fr. Foley silicone catheter.

Ventral graft urethroplasty

The bulbar urethra was exposed and longitudinally opened along its ventral surface. The oral graft is sutured to the urethral mucosa and the spongiosum tissue is sutured over the graft. A Foley 16 silicone catheter is left in place for 4 weeks.

RESULTS

A total of 18 patients were considered eligible for review according to the inclusion/exclusion criteria. Median patient age was 40 years (range 22-70). In the majority of patients, the stricture etiology was caused by catheter (22.2%) or urethral instrumentation (22.2%) (**Table 1**). The stricture involved the distal urethra (meatus and navicularis tract) in 6 (33.3%) patients, the penile urethral in 2 (11.1%), the bulbar urethra in 8 (44.4%) and the anterior urethra for its entire length (pan-urethral stricture) in 2 (11.1%) (**Table 2**). The urethral stricture length ranged from 1 to 5 cm and 2 patients showed pan-urethral strictures (**Table 3**). Only 1 patient (5.6%) had not had any previous treatment and the majority of patients undergone previous failed urethrotomy (55.5%) or periodic dilation (22.1%) (**Table 4**). All patients underwent one-stage repair using oral mucosal graft. The surgical techniques are summarized in **Table 5**. With a median follow-up of 11 months (range 1 to 25), no patients develop recurrence of stricture.

DISCUSSION

Our survey herewith confirm that one-stage reconstruction of anterior urethra using oral mucosal graft is successful in a large series of patients. We mainly used the transplant of the graft as an inlay inside the urethral plate as described by Asopa in 2001 or as an only in the ventral bulbar urethral

surface as described by Morey and McAninch in 1996 and revisited by Barbagli et al. in 2013^{8,9,10}. Using only three different techniques we were able to repair 18 different urethral stricture diseases. In two patients presenting panurethral stricture involving all the penile and bulbar urethra we combined the Asopa's technique, we used for penile urethroplasty, with the ventral onlay graft technique we used for bulbar urethroplasty.

The main limitation of our study is the small number of patients here reported (18 cases) and the short followup (median 11 months). Considering the current life expectancy in Western countries, failures could be detected after 20 years and our observation time may be considered short using such as comparison.⁷ Furthermore, as reconstructive urology continues to evolve, the definition of failure and methodologies to assess urethral integrity are becoming increasingly important to enable us to compare future studies.⁷

CONCLUSIONS

One-stage urethroplasty with oral mucosa provide excellent results in a limited series of patients showing different penile and bulbar stricture diseases.

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LEGEND OF FIGURES

Figure 1. Pre-operative urethrography showing long complex bulbar urethral stricture. Intraoperatively appeared few mm from the external sphincter.

Figure 2. Post-operative urethrography showing a regular penile and bulbar tracts after ventral oral mucosal graft urethroplasty (Barbagli's procedure).

etiology	N. patients (%)
catheter	4 (22.2%)
instrumentation	4 (22.2%)
lichen sclerosus	3 (16.7%)
failed hypospadias repair	3 (16.7%)
idiopathic	2 (11%)
congenital	1 (5.6%)
infection	1 (5.6%)
total	18

Table 1: stricture etiology

site	N. patients (%)
meatus-navicularis	6 (33.3%)
penile	2 (11.1%)
bulbar	8 (44.4%)
pan-urethral	2 (11.1%)
total	18

Table 2: stricture site

length	N. patients (%)
1-2 cm	1 (5.6%)
2-3 cm	7 (38.9%)
3-4 cm	3 (16.7%)
4-5 cm	5 (27.8%)
pan-urethral	2 (11%)
total	18

Table 3: stricture length

previous treatment	N. patients (%)
none	1 (5.6%)
dilation	4 (22.1%)
urethrotomy	10 (55.5%)
meatotomy	1 (5.6%)
urethroplasty	1 (5.6%)
associated treatments	1 (5.6)
total	18

Table 4: previous treatment

stricture site	Number of patients	type of urethroplasty
meatus-navicularis	6	3 Asopa 3 graft + flap
penile	2	2 Asopa
bulbar	8	6 ventral 2 Asopa
panurethral	2	1 ventral + Asopa 1 ventral
total	18	

Table 5: type of urethroplasty