

Analysis of short-term results of monsieur's tunica albuginea urethroplasty as a definitive procedure for pan-anterior urethral stricture

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Abstract

Context: Long anterior urethral strictures are fairly common in developing world and the treatment is equally challenging.

Aim: To assess the results and efficacy of Monsieur's Tunica Albuginea Urethroplasty (TAU) for anterior urethral stricture.

Settings and Design: We analyzed the results in 10 consecutive patients with pan-anterior urethral stricture, who underwent Monsieur's urethroplasty.

Materials and Methods: The procedure involves mobilization of strictured urethra and laying it open with a dorsal slit. Edges of the slit-open urethra are sutured to edges of the urethral groove to the tunica of corporal bodies with catheter *in situ*. Results were assessed postoperatively 3, 6, 9 and 12 months. Patients were categorized as success and failure by comparative analysis of patient satisfaction along with urethroscopy, retrograde urethrogram, uroflowmetry. All patients were taken for post-operative urethroscopic analysis at 6 months to allow better understanding of both successful and failed cases.

Results: Mean follow-up of 15.2 (11-19) months showed an 80% success rate. Mean uroflow rate showed Qmax 24.5 cc/sec with 8 cases showing no residual or recurrent stricture. Two cases failed and required intervention. Urethroscopic visualization of the reconstruction site showed wide, patent and distensible neourethra appearing epithelized over roof formed by tunica albuginea of the corpora cavernosa in successful cases.

Conclusion: Monsieur's TAU is effective technique in treatment of anterior urethral stricture especially cases with unavailable buccal mucosa, with results fairly acceptable at the end of one year.

Key Words: Stricture, anterior urethra, buccal mucosa, substitution urethroplasty

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INTRODUCTION

Long anterior urethral strictures are fairly common in

developing world and the treatment is equally challenging. Anastomotic urethroplasty has the highest success rate but not without limitation of length of stricture which can be bridged. Results of urethroplasty procedures decline with increase in length of strictures. Dorsal onlay buccal mucosa graft (BMG) urethroplasty has shown highest success rate across studies and claimed gold standard for anterior urethral strictures.^[1,2] Yet it might not always be feasible to perform BMG urethroplasty due to lack of healthy buccal mucosa owing to tobacco chewing or need of very long graft of such strictures. Original procedure of tunica albuginea urethroplasty was described by Monsieur in

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1969, creating neourethra through suburethral groove without any graft or flap placement.^[3-7] Recently there have been various reports of use of Monsieur's tunica albuginea urethroplasty (TAU) for short and long segment urethral strictures with acceptable success rates.^[8-11] We evaluated short term results of Monsieur's urethroplasty for panurethral strictures with unavailable BMG.

MATERIALS AND METHODS

With approval from institution research committee between August, 2010 and December, 2010, we included ten consecutive cases of pan anterior urethral stricture with either unhealthy oral mucosa or available limited length of buccal mucosa insufficient to bridge the entire length of stricture. Pan anterior stricture was defined as strictures longer than six cms and/or involving both penile and bulbar urethra.

Pre-operative evaluation included retrograde urethrogram (RGU), uroflow rate (UFR) and urethroscopy. Patients underwent Monsieur's tunica albuginea urethroplasty with I6 Fr. Silicon catheter *in situ* for 3 weeks. Surgical procedure [Figure 1] involved an urethrostomy being made through the stricture on the dorsal wall; edges of the stricture were then sutured open to the underlying tunica albuginea of corpora cavernosa or triangular ligament, or both.^[1,8] In three patients had severe

meatal stenosis due to lichen sclerosis hence, were dealt with dorsal BMG meatoplasty with remaining length of stricture treated by Monsieur's procedure. In rest seven patients no graft was used. Post-operative evaluation after catheter removal at 3 weeks involved UFR followed by UFR and RGU at three months, UFR and Urethroscopy at six months and only UFR at nine and twelve month.

Mean age of patients was 39.7 years (19-52 years) while inflammatory strictures were most common. Six patients had undergone some form of previous intervention in form of dilatation to attempted internal urethrotomy. Three patients had Balanitis xerotica obliterans (BXO) involving meatus. Intraop mean stricture length was 10.8 cm with range of 8.3 to 14.5 cm. Out of ten patients seven were on suprapubic drainage preoperatively. Rest three patients had severely compromised flow with Qmax mean of 5.7 cc/Sec and range of 4.5-6.8 ml/sec. Results were analyzed as success or failure based on findings of post-operative RGU, UFR (>15 or <10 ml/sec), need of further instrumentation, and post-operative urethroscopy.

RESULTS

Follow-up ranged from 13 months to 19 months with mean of around 15.2 months. Postoperatively 8 out of 10 patients had

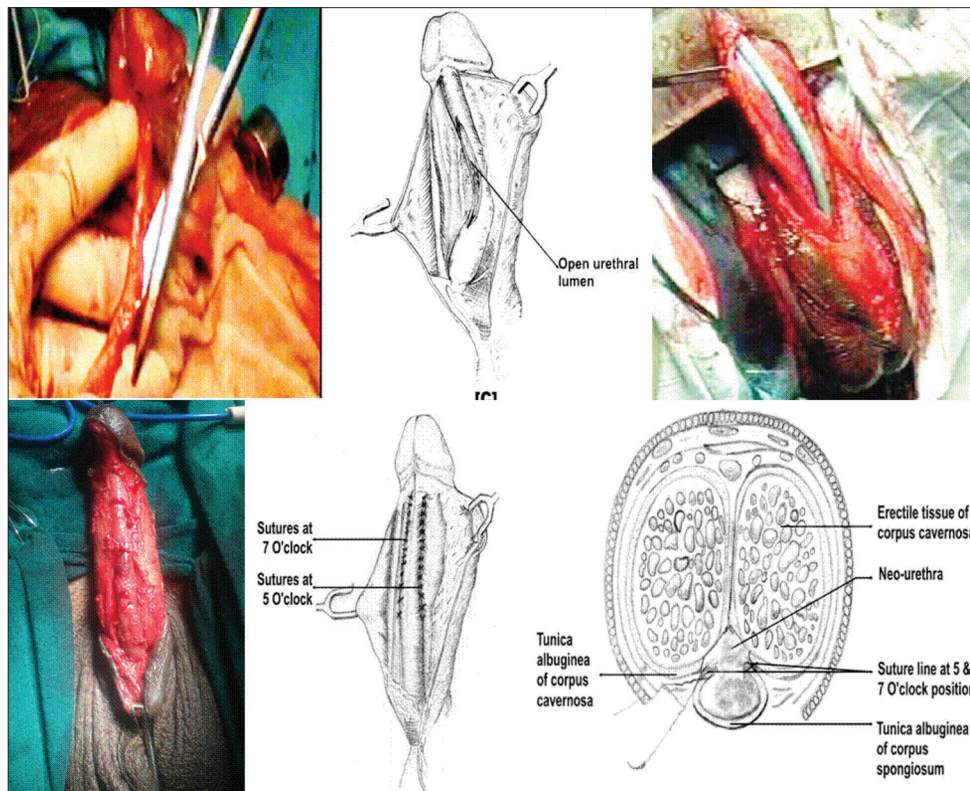


Figure 1: Procedure involves opening urethra dorsally and suturing back the laid open edges of urethrotomy to the tunica albuginea of corpora cavernosa at the edges of urethral groove without placing any graft or flap

good follow-up parameters [Figure 2]. All successful patients had UFR with Qmax ranging from 21.7 to 32 ml/sec with mean of 24.5 ml/sec.

One failed case had entire stricture length 14.5 cms. Postoperatively at six months patient had Qma \times 7.6 ml/sec and during urethroscopy revealed partial obstruction at level of penobulbar junction, which was dilated on endoscopy and catheterized for a week. After catheter removal his UFR improved to Qma \times 18.4 ml/sec at end of one year of follow-up. Although patient is satisfied with voiding but complaining of chordee on erection. Figure 3 shows pre and post operative RGU of first failed case.

Another case had pre-operative BXO and meatal stenosis repaired with dorsal BMG meatoplasty. At the end of 9 months patient started having thin stream with evaluation revealed recurrent meatal stenosis requiring repeat meatoplasty.

In successful cases urethroscopy revealed satisfactory appearance of neourethra with area of roof appearing epithelized although final confirmation can only be a biopsy from roof area [Figure 4].

DISCUSSION

Tunica albuginea is present over both the corpora (cavernosa and spongiosa). The only major difference between them is that the tunica of corpora cavernosa contains inner circular outer longitudinal where as the tunica of corpora spongiosa has abundance of only circular fibers. Outer longitudinal layer of tunica of cavernosa is absent between 5 to 7 o'clock, the area where tunica of corpora cavernosa forms the urethral groove on which the whole urethra rests.^[1] Hence, at this groove the histoanatomical property of tunica corpora cavernosa and spongiosa is almost similar i.e. the tunica here has only circular fibers. Same principle is applied in cases of Tubularized incised plate (TIP) urethroplasty for where the tunica exposed after incision of plate forms the roof of neourethra and has proved the test of time in that application.^[12,13]

Many studies^[14,15] have reported that a ventral graft technique has a significant disadvantage over dorsal only urethroplasty. It is claimed that these complications are decreased if the graft is opposed dorsally over the urethral groove.^[16] Barbagli *et al.*^[17] following the concept advocated by Monsieur, introduced the dorsally placed graft, and postulated that dorsal placement is advantageous as it allows better mechanical support for the graft with a richer vascular bed for the graft from the underlying corporeal bodies.^[17,18] It is observed that grafts give better results than flaps owing to the ease of technique, while buccal or penile skin grafts show equivalent results.^[19] So if we assume that dorsal onlay grafts have results better than ventral, then

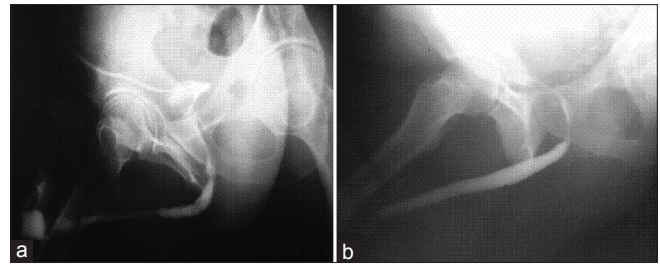


Figure 2: Pre and post-operative RGU of representative successful case

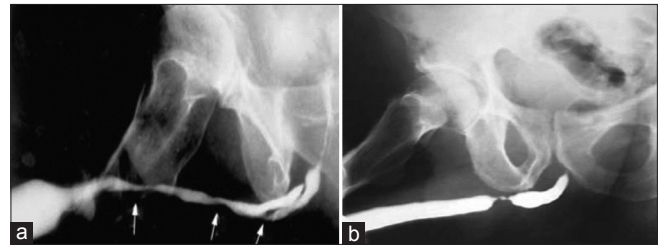


Figure 3: Pre and post-operative RGU of representative failed case

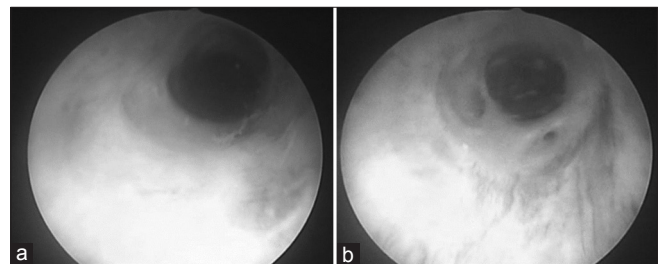


Figure 4: Post-operative urethroscopic images of successful cases with wide patent urethra

it is probably the site of graft application rather than the type of graft material that is responsible for high rates of success.

Our experience with TAU has shown that tunica albuginea maintains the patency of neourethra and has shown encouraging results in short term with acceptable procedure related complications. Surely study is not without its limitations as study includes only ten cases and longer followups are still awaited. Procedure can not be performed in meatal area as tunica albuginea is unavailable there. Procedure might not work well in presence of BXO which is a worse predictor even for any other substitution urethroplasty. Procedure was mentioned almost 40 years back,^[3,4] yet has not been very popular although no reports exist to question its viability. Claimed results need to be tested against virtual gold standard Dorsal onlay BMG urethroplasty, in a randomized controlled study.

Monsieur's urethroplasty is easy to perform, with short learning curve, without graft morbidity, requiring less time and resources. Technique has shown good success rate in our study which is comparable to BMG urethroplasty. Tunica albuginea

itself appear sufficient to maintain lumen without graft or flap. Available evidence suggests it as an option in urologist armamentarium for cases with unavailable BMG.

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