DORSOLATERAL ONLAY OMG URETHROPLASTY THROUGH UNILATERAL URETHRAL MOBILIZATION IN ANTERIOR URETHRAL STRICTURE - OUR EXPERIENCE IN DHAKA MEDICAL COLLEGE HOSPITAL AND SALAM UROLOGY & TRANSPLANTATION FOUNDATION OF BANGLADESH (FUTF)

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Abstract:

Introduction: Circumferential urethral mobilization may result in ischemia of urethra in conventional anterior dorsal onlay urethroplasty. We performed dorsolateral onlay OMG urethroplasty in anterior urethral stricture through unilateral mobilization of urethra to preserve its vascular supply.

Objective:To evaluate the feasibility and short term outcome of using dorsolateral onlay OMG urethroplasty in anterior urethral stricture through unilateral urethral mobilization.

Method: In this prospective study, 27 patients with average age of 38 years underwent anterior dorsolateral onlay OMG urethroplasty through unilateral urethral mobilization in tertiary care hospital. In all patients, the surgical approach to the anterior urethra was made only along one side leaving the urethra attached to the corpora cavernosa on the opposite side thus preserving its vascular supply intact on one side. The cause of stricture was instrumentation in four cases (14%), lichen sclerosis in thirteen cases (48%), unknown in seven cases (25%) and infection in three cases (11%).The stricture site was bulbar in 10 cases and panurethral in 17 cases. Average length of the stricture segment was 4cm and 9 cm in bulbar and panurethral respectively. Of 27 patients, 20 received previous treatment. Clinical outcome was considered a failure when postoperative Q_{max} was <10ml/sec and/ any instrumentation were needed. Patient who underwent previous urethral reconstruction surgery was excluded from the study.

Result: Of the 27 patients, 25 had (92%) successful outcome and 2 (8%) were failure. Two failed cases underwent successful optical internal urethrotomy. Follow up period was 4 months to 20 months.

Conclusion: Dorsolateral onlay urethroplasty of anterior urethral stricture preserving vascular supply along one side of its entire length of reconstruction is a simple and may be a reliable solution for better outcome.

Key words: *Urethroplasty, Anterior urethral stricture, Dorsolateral onlay.*

Introduction:

Reconstruction of urethral stricture is still challenging. Various methods have been described. The conventional approach for management of long segment anterior urethral stricture is a two-stage Johanson repair along with the use of free grafts if required.[1,2,3] Barbugli *et al* and Asopa *et al* described dorsal graft urethroplasty in different ways.[5,7] In 2000, Kulkarni *et al* described a new, full length one stage OMG urethroplasty in patients with panurethral stricture due to lichen sclerosis with the preservation of unilateral vascular supply of urethra.[(6)] We applied this technique to reconstruct anterior urethral stricture including panurethral stricture in our centre. Here is our experience.

Patients and Methods:

In this prospective study from March 2009 to August 2010, 27 patients with average age of 38 years (range: 25 to 57 years) underwent one sided anterior dorsolateral onlay OMG urethroplasty while preserving the vascular supply of opposite side of urethra. The study was under taken in the dept. of Urology, DMCH & Salam Urology and Transplantation Foundation (SUTF).

Preoperative evaluation included history, physical examination, urinalysis, USCD, and retrograde and voiding cystourethrography. The cause of urethral stricture was previous urethral instrumentation in 4 cases (14%), unknown in 7 cases (25%), lichen sclerosis in 13 cases (48%) and infection in 3 cases (11%). The stricture site was bulbar in 10 and panurethral in 17 cases. Average length of the stricture segment was 4 cm and 9 cm in bulbar and panurethral respectively. Of them 20 patients received previous treatment: Optical internal urethrotomy in 14 (70%), dilatation in 6(30%). Patients with non obliterative anterior urethral stricture were included in the study while previous urethroplasty or other urethral abnormalities (ie PUDD, hypospadias etc.) were excluded from the study.

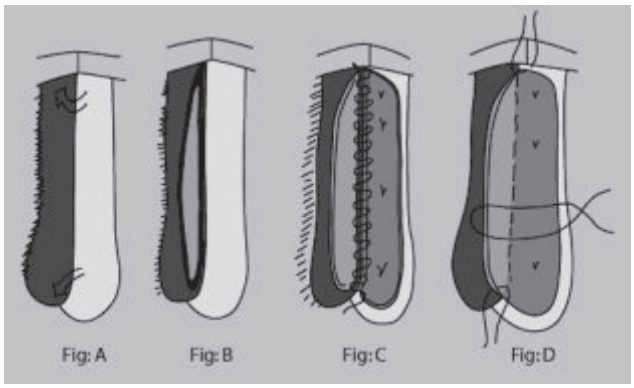


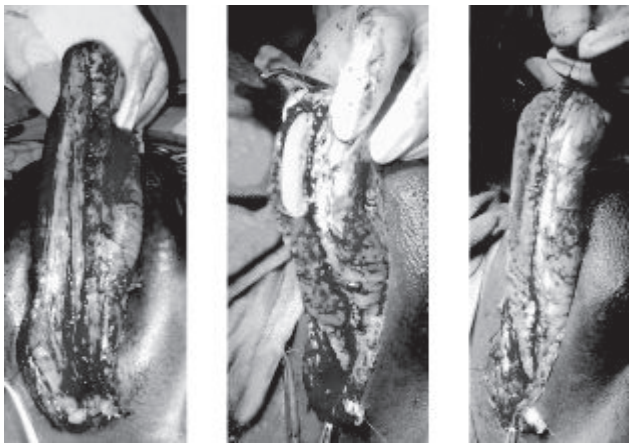
Figure 1[9]: *(A) Mobilization of urethra beyond midline dorsally, (B) Dorsal uethrotomy, (C) Graft sutured to medial urethral margin, (D) Free margin of the graft sutured to lateral urethral margin.*

An intra-operative urethroscopy was performed to evaluate the caliber of the narrow urethra and the remaining urethra. We performed the dorsolateral onlay procedure only when a guide wire could be negotiated through the non obliterative stricture segment. Urethroplasty was started by a midline perineal approach, with the patient in a high lithotomy position. The penis was everted through the perineal incision. The urethra was mobilized from left side of the ventral aspect to beyond the midline on the dorsal aspect [Figure 1A]. Fascia and vascular attachments on the other side of the urethra were left intact. Maximum distal and proximal limits of dissection were meatus and bulbomembranous junction. Urethrotomy was made in the midline dorsally [Figure 1B]. Appropriate sized buccal mucosal grafts were harvested (from one or both cheeks). The length of the area to be grafted was measured by the incised length of the urethra. Graft sizing was appropriate by this method; hence, preventing chordee. After defattening, the graft was sutured proximally to the open urethra by a few interrupted sutures at the apex and at the medial urethral margin. Then, one edge of the graft was sutured to the medial urethral margin, which was in place and fixed to the corpora [Figure 1C]. This was performed by continuous suturing using 5/0 polyglactin sutures until the distal apex. At the distal apex, few interrupted sutures were taken. Quilting sutures were applied to keep the graft apposed to the tunica. A 14 Fr Foleys catheter was kept. The other margin of the graft was sutured to the lateral margin of the urethra and the tunica of corpora [Figure 1D]. These three tissues were taken together while approximating the lateral edge, thereby anchoring both graft and urethral margin to the corporal tunica. During the entire procedure, care was taken to prevent stretching of the graft, which might result in chordee. A corrugated drain was kept. The bulbospongiosus muscle was approximated in the midline. Subcutaneous tissues and skin were closed with interrupted absorbable sutures.

In patients with panurethral strictures, a midline perineal incision was made and the bulbar urethra was dissected on the left side from the corpora cavernosa. On the right side, the urethra remains attached to the corpora cavernosa along its entire length, thus preserving its lateral vascular blood supply. By invaginating the penis into the perineal incision, the penile urethra was similarly dissected, only along the left side, from the corpora cavernosa up to the coronal sulcus. On the left side, the urethra was partially rotated and dorsal midline urethrotomy was made. A wide meatotomy was performed dorsally from the meatus through the urethra inside the glans. The first oral mucosa graft was sutured to the dorsal edge of the meatus and pushed inside the opened penile urethra and fixed to the corpora cavernosa. Another oral mucosa graft was applied to the corpora cavernosa opposite the bulbar urethra. Quilting sutures were used to spread and fix the graft to the corpora. The right side of the oral graft was sutured to the attached margin of urethral mucosal. A Foley 14F catheter was inserted. The urethra was rotated to its original position over the graft. Interrupted 5/0 polyglactin sutures were used to stabilize the urethral margins onto the corpora cavernosa over the graft on the left side. At the end of the procedure, the graft was completely covered by the urethra. The catheter was left in situ for 3 weeks.

The patient ambulated on the first postoperative day and was discharged from the hospital 5 days after surgery. All patients received broad-spectrum antibiotics and were maintained on oral antibiotics until the catheter is removed. At 3 weeks after surgery, the bladder was filled with contrast medium, the Foley catheter was removed and voiding cystourethrography was performed.

The results were classified into the following outcomes. Success was defined as a maximum flow rate of >10 ml/sec., normal RGU, and/or urethroscopy (with a 19 fr. sheath). Failure was defined as the presence of obstructive urinary tract symptoms, Qmax <10 ml/sec., stricture diagnosed on retrograde urethrogram/ urethroscopy, and the need for any postoperative urethral intervention.



(A) (B) (C)

(A) Mobilization of urethra and dorsal urethrotomy,
(B) Graft placement and ongoing tubularization of urethra
(C) Complete tabularization of urethra

Fig.-2: *Different stages of dorsolateral onlay urethroplasty (Peroperative pictures)*

Result:

Our short term observation on average 12 months (from 4 months to 20 months) demonstrates satisfactory result in 25 (92%) patients. Clinical outcome was considered as failure when any postoperative instrumentation was needed. In all patients, postoperative voiding cystourethrography was performed 3 weeks after surgery. Uroflowmetry was performed 4 monthly. Urethrography and urethroscopy were performed in patients with symptoms of poor stream and Qmax < 10ml/sec. Two failed cases developed nonobliterative proximal anstomotic stricture and had a successful outcome with OIU. Both of the failures were in the patients of panurethral stricture (Table 1, Table 2). We found postoperative chordee in four cases (23.5%) of panurehtral stricture. Three patients developed wound infection. Urethral diverticulum was not found in any of the patients. Operative time was 2.5 hours to 4.5 hours.

Table-I

Average pre and post opretative -Q_{max} in different groups

Average	*Bulbar stricture*	*Panuethral stricture*
pre opretative -Q_{max}	*08.1 ml/sec*	*06.9 ml/sec*
post opretative -Q_{max}	*17.3 ml/sec*	*16.5 ml/sec*

Table-II

Outcome in different group (Success-Q_{max} >10ml/s, Failure-Q_{max} <10 ml/s)

Post operative -Q_{max}	Bulbar stricture (17)	Panurethral stricture (10)
>10ml/s	10 (100%)	15(88%)
<10ml/s	00	2(12%)

Discussion

In the original dorsal onlay techniques the urethra is circumferentially mobilized form the corpora cavernosa for better exposure of its dorsal surface which becomes convenient to spread and fix the graft over the underlying albuginea.[5,6] A circumferential dissection of the whole anterior urethra risks the vascularity of the urethra, which may be more important if the meatus is involved with disease and the distal-most urethra is extensively dissected, such as is seen with concomitant lichen sclerosis. The Barbagli procedure with circumferential mobilization of the urethra for dorsal onlay patch has a success rate of 99% and 66% in the short- and long-term, respectively.[8] However, in long segment anterior urethral strictures, circumferential urethral mobilization may jeopardize the lateral vascularity of the urethra.

Inlay patch by ventral urethrotomy for the management of anterior stricture urethra was described by Asopa. His procedure preserves lateral vascular supply. But there are difficulties in placement of long wider grafts which may became folded.[7]

Kulkarni et al have shown good result with dorsal onlay technique through dorsolateral mobilization of urethra.[(4)]

We applied the technique to maintain the urethral vascularity on one side of the urethra while keeping the graft in a dorsolateral onlay fashion. Technically, it is as easy as the Barbagli procedure. It also preserves the one-sided bulbar artery in addition to maintaining the native lateral vascularity at the meatus and the distal urethra.

We found postoperative chordee in four cases (23.5%) of panurehtral stricture. In this procedure, as the urethra is not completely mobilized off the corpora so appropriate graft sizing would prevent the chordee.

Our experience with small number of sample over short period is good but long term follow up is necessary to comment on actual outcome.

Conclusion:

Various published articles eluded that dorsal patch urethroplasties are the mainstay of treatment for single-stage repair of long segment anterior urethral strictures. Dorsolateral patch by one-sided urethral mobilization may be a good alternative to extensive circumferential mobilization of urethra. In this study of a limited number of patients, we found it to be a technically feasible, easily adoptable and successful procedure. Though short-term follow-up of 12 months (from 4 months to 20 months) Shows encouraging result but long-term results of this procedure are yet to be evaluated. Data collection is ongoing for further long term follow-up.

References:

1. Al-Ali M, Hajaj RA 2001. 'Johanson's staged urethroplasty revisited in the salvage treatment of 68 complex urethral stricture patients: Presentationof total urethroplasty', *Eur urol*, vol.39,pp.268-71
2. Schreiter F. 1998 'Two-stage urethra-plasty' *Urology A*, vol.37, pp.42-50
3. Bouchot O, Cases C Bochereau G, PrunetD, Buzelin JM. 1995. 'Urethroplasty in two stages using skin graft. *Prog urol,* vol.5, pp.551-5.
4. Kulkarni S,Barbagli G,sansalone S, Lazzeri M, 2009, 'One sided anterior urethroplasty; a new dorsal onlay graft technique', *BJUI* , vol.104,pp.1150-1155
5. Barbagli G, Selli C, Palminteri E. 1996, 'Dorsal free graft urethroplasty' *J Urol* ,vol.155,pp.123-6
6. Kulkarni SB, Kulkarni JS, Kirpekar DV.2000, 'A new technique of urethroplasty for balanitis xerotica obliterans.' *J Urol*,vol.163 (Suppl.),pp.352 (abstract V31)
7. Asopa HS, Garg M, Singhal GG, Singh L, Asopa J, Nischal A.2001, ' Dorsal free graft urethroplasty for urethral stricture by ventral sagittal urethrotomy approach.' *Urology*, vol. 58,pp.657–9
8. Barbagli G, Morgia G, Lazzeri M.2008, 'Dorsal onlay skin graft bulbar urethroplasty: Long-term follow-up' *Eur Urol,* vol.53, pp. 628-33.
9. Singh BP, Pahtak HR, Adnankar MG 2009 'Dorsolateral onlay urethroplasty for anterior urethral stricture by a unilateral urethral mobilization approach' *Indian J Urol*, 25,vol.25, pp. 211-4

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