

Delayed Primary End-to-end Anastomosis for Traumatic Long Segment Urethral Stricture and its Short-term Outcomes

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Abstract

Background: The purpose of this study is to evaluate the aetiology of posterior urethral stricture in children and analysis of results after delayed primary repair with extensive distal urethral mobilisation. **Materials and Methods:** This was a retrospective study carried out in a tertiary care centre from January 2009 to December 2013. **Results:** Eight children with median age 7.5 years (range 4–11 years), underwent delayed anastomotic urethroplasty: Six through perineal and two through combined perineal and transpubic approach. All the eight children had long-segment >2 cm stricture: Three posterior and five anterior urethral stricture. On a mean follow-up period of 33 months (range 24–48 m), all were passing urine with good flow and stream. **Conclusion:** End-to-end anastomosis in post-traumatic long segment posterior urethral stricture between prostatic and penile urethra in children is possible by perineal or combined perineal and transpubic approach with good results without any urethral replacement.

Keywords: Delayed anastomosis, outcome, traumatic stricture urethra

INTRODUCTION

Trauma of different types is a common problem in our country. Pelvic injury in children is a common aetiology of stricture urethra. This may be associated with injury of other organ systems such as rectum, bladder and pelvic bone. Post-traumatic urethral injury is initially managed by suprapubic cystostomy (SPC). Ideal treatment for posterior urethral stricture and distraction defect is an end-to-end anastomosis. A clear distinction should be made between urethral stricture, which is a continuity stricture and distraction defect, where complete rupture of the urethra results in a distraction defect and obliterative stricture.^[1]

Urethral repair is performed through either perineal or combined perineal and transpubic route depending on the extent of stricture segment. The aim of this study is to report the approaches of repair in long-segment stricture and its outcomes on short-term follow-up.

MATERIALS AND METHODS

This is a retrospective study done at a tertiary care centre. We review our data from 2009 to 2013. Totally eight

patients had been operated with pelvic trauma and urethral distraction injury. In all patients, SPC was made following trauma and definitive repair done after 6 months. Complete blood count, serum urea, creatinine, urine routine and culture and sensitivity were done in every child. Assessment of length of stricture segment was made by doing retrograde [Figure 1] and voiding cystourethrogram [Figure 2]. Patient with congenital stricture, meatal stenosis, post-hypospadias, post-instrumentation stricture were excluded from the study. Stricture segment <2 cm and failed endoscopy urethrotomy stricture were excluded. Operation in each child was done under general anaesthesia in lithotomy position with adequate leg support. Midline incision was made over median raphe extending anterior to anus to base of scrotum [Figure 3 (left side)]. Stricture segment was identified and measured by placing one urethral catheter, and one dilator passed

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through suprapubic opening into bladder neck. Stricture segment including surrounding fibrous tissue was excised and mobilisation of distal urethra done up to base of glans penis depending on the extent of stricture segment. Symphysiotomy was needed in long stricture for tension-free anastomosis. Spatulation of both ends of mobilised urethra and urethro-urethral anastomosis done with 5-0 vicryl over a Foley catheter passed per urethra [Figure 3(right side)]. Six stitches were placed, three anterior and three posterior interrupted stitches. At the end of the procedure, two catheters were kept: One urethral and another suprapubic Foley catheter. Urethral catheter was removed 3 weeks after the operation. Suprapubic catheter was removed 4 weeks after the operation following an ascending urethrogram. Ascending urethrogram, ultrasonography, and urodynamic study were done after 3 months in every patient.

The purpose of the study is to evaluate the aetiology of posterior urethral stricture in children, and evaluate the results

after delayed primary repair with extensive distal urethral mobilisation.

RESULTS

Eight patients were operated in the period of 5 years. All patients had long segment (>2 cm) stricture [Table 1]. Median age was 7.5 years (range 4–11 years). Among eight children, there was posterior urethra distraction injury in three and anterior urethra straddle injury in five children. Associated pelvic fracture was found in two patients with posterior urethral stricture. Through perineal midline incision, stricture segment identification and anastomosis was possible in six children. Combined perineal and transpubic approach was needed in two children: One with stricture segment 5 cm and other in failed perineal operation. Substitution urethroplasty was not done in any of the eight children. Mean follow-up period was 33 months (range 24–48 months). One patient developed recurrent stricture at 12 m follow up, required redo



Figure 1: Retrograde urethrogram showing urethral stricture



Figure 2: Anterior cystourethrogram showing urethral stricture

Table 1: Detailed parameters of our series ($n=8$)

Age (years)	Sex	Site of injury mechanism	Length of stricture (cm)	Operative technique	Complications	Follow up (month)
8	Male	Posterior urethra Fracture pelvis	3.5	Anastomotic repair Perineal approach	-	48
7	Male	Posterior urethra	6.0	Anastomotic repair Symphysiotomy	Anastomotic stricture underwent redo urethroplasty	40
4	Male	Anterior urethra Straddle injury	2.5	Anastomotic repair Perineal approach	Anterior urethral diverticulum	36
11	Male	Anterior urethra Straddle injury	2.5	Anastomotic repair Perineal approach	-	24
9	Male	Anterior urethra Straddle injury	3.0	Anastomotic repair Perineal approach	-	30
6	Male	Anterior urethra Straddle injury	2.5	Anastomotic repair Perineal approach	-	36
7	Male	Posterior urethra Fracture pelvis	5.5	Anastomotic repair Symphysiotomy	-	24
8	Male	Anterior urethra Straddle injury	2.5	Anastomotic repair Perineal approach	-	24

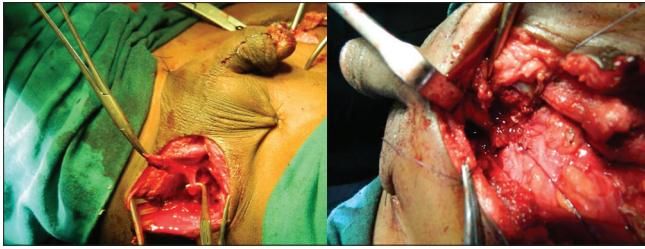


Figure 3: Operative picture: Perineal approach-incision and exposure to show the strictured segment (left side) spatulated end to end anastomosis with 5/0 vicryl after completion (right side)

urethroplasty and was doing well at 40 months follow-up. Another patient developed anterior urethral diverticulum, underwent excision and subsequently did well on 36 months follow-up in a minimum of 2 years follow up all the other children are passing urine with good flow and stream. Initially, two patients were incontinent but gradually they regained continence up to near normal level.

DISCUSSION

Common causes of urethral stricture are post-traumatic, inflammatory and iatrogenic.^[2] In children, trauma is a major cause in developing country and since posterior urethra is not protected by prostate, it may be injured at any level. Transpubic approach is often used for repair in such cases.^[1] In this study, traumatic long segment stricture were dealt with, and short segment stricture and stricture due to other causes were excluded. Children presented with pain abdomen, urinary retention, bleeding per urethra following trauma. All had initially undergone SPC. Initial SPC followed by delayed repair was first proposed by Johansson in 1953 and has the advantage of the complex delayed anastomotic urethroplasty being performed in controlled settings when the patient is stable. Therapeutic options are endoscopic treatment for short stricture.^[3] Long-segment stricture and failed endoscopic treatment needs open reconstruction. Open reconstruction is done through perineal route^[4] or combined perineal and transpubic approach.

Clinical signs for urethral stricture in children can be incontinence and bedtime wetting or common symptoms such as difficulty in micturition, weak urinary flow, and recurrent urinary tract infection. Pelvic fracture posterior distraction defects frequently lead to obliterative strictures and cause urinary retention.

Before repair of urethra, proper assessment of stricture segment is of paramount importance to get good results. The importance of pre-operative assessment has been emphasised by many authors.^[5,6]

Assessment of the extent of stricture segment is done by doing cystourethrogram. Actual assessment may not be possible if bladder neck is not opened during voiding or proximal urethra opened into a cavity giving underestimation of stricture segment.

Endoscopy before operation helps in assessing the extent of stricture segment in combination with radiology. Both retrograde urethroscopy and antegrade cystoscopy were done in all our patients before operation. Proper detection of long-segment stricture in 8 patients helped us in planning incision length and mobilisation of urethra.

In our series, six patients were operated through perineal route and two patients operated through combined perineal and transpubic route. Different types of incision can be made like inverted u or y incision. We made midline incision in all cases. Progressive dissection and identification of stricture segment and mobilisation of distal urethra even up to coronal sulcus so as to allow anastomosis without tension. Stricture segment was <5 cm in six patients so anastomosis could be done without symphysiotomy. One patient with stricture segment more than 5 cm and another recurrent stricture needed symphysiotomy for transpubic anastomosis. Koraitim in his series was able to achieve a satisfactory perineal anastomosis if the stricture segment was up to 3 cm, and he resorted to transpubic urethroplasty in longer segments.^[5] Similarly, Hafez *et al.* were able to bridge gap of up to 5 cm by perineal route achieving a success rate of 100%.^[6]

In our small series of eight patients with long stricture one patient developed recurrent stricture and successfully managed by combined perineal and transpubic route. In the post-operative period voiding normalised in 2–3-month period.

Podesta operated on 15 children with posterior urethral stricture by perineal urethroplasty and had an overall success rate 84%.^[7]

In our series, there was neither penile curvature nor penile shortening. Hafez *et al.* reported similar results in their series.^[6]

Regarding stress incontinence we had one patient developing stress incontinence and resolved on 2–3 month period of follow-up. Overall success rate was 100%. Das *et al.* operated on ten children using transpubic urethroplasty and they also reported 100% success and children are also continent.^[8]

CONCLUSIONS

Proper pre-operative assessment of stricture segment is of paramount importance in planning operative approach in long segment stricture. Delayed primary urethroplasty in traumatic urethral stricture gives good results in expert hands even without urethral replacement. Anastomotic urethroplasty through perineal approach was possible up to 5 cm long-segment stricture. Symphysiotomy allowed urethroplasty through combined transpubic and perineal approach when length stricture segment >5 cm and even in redo long-segment posterior urethral stricture between prostatic and penile urethra. Proper pre-operative assessment of the extent of stricture segment helped in selection and planning of the operative approach.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Orabi S, Badawy H, Saad A, Youssef M, Hanno A. Post-traumatic posterior urethral stricture in children: How to achieve a successful repair. *J Pediatr Urol* 2008;4:290-4.
2. Lumen N, Hoebeke P, Willemsen P, De Troyer B, Pieters R, Oosterlinck W. Etiology of urethral stricture disease in the 21st century. *J Urol* 2009;182:983-7.
3. Diamond DA, Xuewu J, Bauer SB, Cilento BG Jr., Borer JG, Nguyen H, *et al.* What is the optimal surgical strategy for bulbous urethral stricture in boys? *J Urol* 2009;182 4 Suppl: 1755-8.
4. Shenfeld OZ, Gdor J, Katz R, Gofrit ON, Pode D, Landau EH. Urethroplasty, by perineal approach, for bulbar and membranous urethral strictures in children and adolescents. *Urology* 2008;71:430-3.
5. Koraitim MM. Post-traumatic posterior urethral strictures: Preoperative decision making. *Urology* 2004;64:228-31.
6. Hafez AT, El-Assmy A, Sarhan O, El-Hefnawy AS, Ghoneim MA. Perineal anastomotic urethroplasty for managing post-traumatic urethral strictures in children: The long-term outcome. *BJU Int* 2005;95:403-6.
7. Podestá ML. Use of the perineal and perineal-abdominal (transpubic) approach for delayed management of pelvic fracture urethral obliterative strictures in children: Long-term outcome. *J Urol* 1998;160:160-4.
8. Das K, Charles AR, Alladi A, Rao S, D'Cruz AJ. Traumatic posterior urethral disruptions in boys: Experience with the perineal/perineal-transpubic approach in ten cases. *Pediatr Surg Int* 2004;20:449-54.