

Assessment of Long Term Results of Single Stage Anastomotic Urethroplasty at Tertiary Care Hospital in Mumbai

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ABSTRACT

Introduction: Aim of present is to evaluate the outcome of the single stage perineal end to end urethroplasty using a number of maneuvers to aid in a mucosa to mucosa tension free anastomosis.

Material and methods: A total of 40 patients with 36 having blind ending stricture and 4 having very narrow lumen in the bulbar and bulbo-membranous region were managed by perineal single staged excision with end to end urethroplasty.

Results: Commonest cause of urethral stricture (55%) is vehicular accident followed by fall from height (20%) and most common site for stricture was in bulbo-membranous urethra (62.5%) followed by bulbar urethra (37.5%). In majority (80-90%) of patients, good results were observed along with less post-operative complication.

Conclusions: Single stage anastomotic urethroplasty is the gold standard treatment in all cases of blind ending stricture of urethra and also in very narrow stricture where VIU has failed.

Keywords: Urethroplasty, Anastomotic, Bulbo-Membranous, Urethral Stricture

Over the years, many new surgical procedures are evolved resulting in better results in cases of urethral stricture.⁴ In view of current knowledge the management of urethral stricture aims at refashioning the previous scar with better characteristics. There are a vast number of surgical procedures advocated and they are still evolving indicating that none of them is completely satisfactory and no surgery is ideal.⁵ There are various treatment options like Visual Internal Urethrotomy (VIU), Augmented Urethroplasty and Anastomotic Urethroplasty. The result of excision and end to end urethroplasty are the best with cure reported in 93-97% patients with stricture disease. Therefore aim of present study was to evaluate the outcome of the single stage perineal end to end urethroplasty using a number of maneuvers to aid in a mucosa to mucosa tension free anastomosis.

MATERIAL AND METHODS

A total of 40 patients with 36 having blind ending stricture and 4 having very narrow lumen in the bulbar and bulbo-membranous region were managed by perineal single staged excision with end to end urethroplasty. Inform consent from patients and institutional ethics committee was taken before study. Particulars like name, age, sex, present history, past history, personal history etc was noted in Performa. General physical examination and local examination was done. Patients with pendulous urethral stricture and had undergone staged urethroplasty were excluded from the study.

All patients were assessed by anesthetist prior to surgery and all patients were undergone elective surgery. Blood grouping and cross matching was done for all patients. All patients underwent a pre-operative routine urine microscopy. All patients underwent single stage perineal end to end urethroplasty using a number of maneuvers to aid in a mucosa

INTRODUCTION

Treatment of urethral stricture in male has long been considered as an enigma to the surgeon. The adage "once a stricture always a stricture" stills hold value. Male urethral disease has adverse effect on the quality of life of patient and it can affect about 3 per 1000 men.^{1,2} Urethral stricture literally means a decrease in the caliber of urethral lumen. This term generally refers to narrowing in anterior urethra or a scarring process involving spongy erectile tissue of the corpus spongiosum (Spongiofibrosis).

In contrast, posterior urethral strictures are not included in the common definition of urethral stricture. Posterior urethral stricture is an obliterative process in posterior urethra that has resulted from fibrosis and it is generally the effect of distraction of the area caused by trauma. Fracture pelvis is associated with trauma and rupture of urethra in 7-10% cases. Traumatic stricture due to distraction injury usually occurs in bulbo-prostatic urethra. In cases of straddle injury, the stricture is seen in bulbar urethra. Traumatic stricture rarely occurs in penile urethra.

Earlier the main cause of urethral stricture was Gonorrhoea³ but with better tools for detection and treatment, this has been replaced by trauma which is the main cause of stricture in urethral injury. Stricture urethra is a chronic debilitating disease which unfortunately affects men in the prime of their age. This leads to loss of working days and decreased productivity because of frequent visit required to the doctor.

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to mucosa tension free anastomosis.

Surgical Procedure: End to End Urethroplasty

Patients were placed in extended lithotomy position with legs in an adjustable leg support. All patients underwent urethroscopy to assess the anterior distal urethra. Suprapubic scopy was done in patients where posterior urethra and bladder neck was not seen. This study defines the extent of urethral defect, site of stricture, confirms the absence of any concomitant stricture and also assesses the status of bladder neck. Surgery commenced with perineal exposure of the bulbar and posterior urethra. Incision commonly employed was inverted U shaped or lambda incision extending from the midline of scrotum to the Ischial tuberosities.

Perineal exposure was used in all patients. The skin, subcutaneous tissue, Colles's fascia was incised to expose the bulbo-spongiosus muscle and the tunica of corpus spongiosum distal to edge of muscle. The ischio-cavernous muscle was separated from the bulbo-spongiosus muscle. Bulbo-spongiosus muscle was incised in the midline and the bulbar urethra was circumferentially mobilized as far as proximally as the obliterated urethral segment. The mobilization is facilitated by incision of posterior attachment of bulb to perineal body. A mastoid retractor was used for retraction and better exposure.

After mobilization of bulbar urethra, a suprapubic urethral dilator was passed through the SPC tract into proximal urethra. If the stricture was short with little fibrosis, the tip of dilator could easily be palpated in the perineum and a simple perineal anasthmosis could be expected. In case, a long distraction defect with dense callus tissue was found. The prostate-membranous urethra was then dissected until healthy edges were identified. At this point, a decision could be made as to whether a simple anasthmosis was feasible or whether any further maneuver would be necessary to achieve a tension free anasthmosis.

These maneuver include further circumferential mobilization of urethra as far as penscrotal junction. Chordee was avoided by not dissecting beyond this point. After dissection, healthy urethra can be mobilized by 2 cm which is often sufficient to achieve anasthmosis. This maneuver alone facilitated anasthmosis in most patients.

Other maneuver was separation of the proximal corporal bodies which was done in 3 cases. The urethra was then laid between the separated bodies again shortening the distance between the cut ends. If the cut ends still appeared to be under tension, inferior pubectomy was done.

A wedge of bone was excised from the inferior surface of the pubis exposed by the corporeal body separation. Dorsal penile vessels encountered were ligated and the periosteum was incised near midline and similarly mobilized subperiosteally laterally. Neural structures tend to be more lateral at this level of corporeal separation and are protected. Regardless of the maneuvers used to facilitate anasthmosis, it is important that anasthmosis to be performed under vision with mucosa to mucosa apposition. This was always possible in our study.

Anasthmosis

Normal cut ends of the proximal and distal urethra were widely spatulated by incising at 12 'O' clock position in proximal end and 6 'O' clock position in distal end. Anasthmosis was done with 4.0 Vicryl using 6-8 interrupted sutures with mucosa to mucosa apposition over a 16 Fr silicone urethral stent. The knot was kept outside the urethra by taking sutures outside in and inside out and tying the knot individually starting at 12 'O' clock commencing clockwise.

The bulbo-spongiosus muscle was reapproximated with No. 3.0 CCG. A corrugated rubber drain of two gutter width was kept and skin closed over it. SPC was kept in all patients. A comprehensive perineal dressing was given to all patients.

In all adult patients, we used a 16 Fr Silicon catheter. In children, we used a 12 Fr and 10 Fr silicon catheters. We retained the suprapubic drainage catheter for 21 days then clamped the SPC and removed the SPC after 2-3 days. We removed urethral stent after another 2 days. In cases where the stricture length was long (2.5-3.0 cm), urethral stent was kept for extra weeks. In case of urinary leak, the stent was kept for 2 more weeks. Post-operative management and follow up was done. All patients were followed up at every 3 months with UFR measurement and assessment of symptoms. If required, urethroscopy was done. If they were asymptomatic at one year, they were labeled as cured. Successful criteria for surgery are UFR > 15ml/min, no symptom and no need for post-operative procedure/VIU/dilatation.

RESULTS

This study was conducted in our institute in 40 patients, who underwent single stage anastomotic end to end urethroplasty, from 1995 to 2003.

The above figure shows youngest patient to be 6 years and oldest 65 years. The most common age group in this study was 31-50 years forming 55% of cases. Collectively 16-50 years age group constituted 82.5% of patients. Children less than 15 years constituted only 10% of our patients. Thus stricture urethra is seen more often in productive years of life rather than at extremes

Vehicular accident accounted for 55% of patients followed by fall from height (20%). Direct trauma constituted 10% of cases. Thus collectively trauma was the major cause (85%) of stricture in our series. (Figure 2)

Table 1 shows that bulbo-membranous region was the commonest site (62.5%) followed by bulbar region (37.5%). The length of stricture included in this series was 0.5 cm or more. The majority of stricture in our series was less than 2 cm (75%). Stricture more than 2 cm constituted 25% of patients.

In our series 5 patients had undergone two or more VIU before urethroplasty was done. Of these 80% had no post operative complication and were considered cure at one year of follow up. One patient had a anastomotic stricture at 3 month follow up. It was managed with VIU after which the stricture stabilized. Three patients had railroading done outside, 66% developed anastomotic stricture within 6 months after urethroplasty. One patient underwent

urethroplasty outside. He developed a stricture with urethrocutaneous fistula which was managed with redouretroplasty with excision of fistula. He developed stricture again and later a perineal urethrostomy was done. He was lost to follow up. 32 patients underwent an end to end primary delayed urethroplasty. All patients had a pre-operative SPC done. 3/32 patients developed anastomotic stricture. They were all managed with VIU and all these strictures were stabilized after one or two VIU. (Table 2)

In our series, good results were seen in 83.4% and 82.4% of patients with inflammatory stricture and traumatic stricture respectively. In present study, results were inferior to those of other reported series as most of the failures were in patients who had undergone redo surgery. All patients where re-stricture occurred after primary anastomosis were asymptomatic after VIU thus good results were achieved in 29/31 (93.5%) cases. 80% of the patients in bulb had anastomotic stricture which was managed successfully by VIU. Thus in our series long term results after urethroplasty

Site	No. of Cases (%)
Bulbar	15 (37.5%)
Bulbomembranous	25 (62.5%)
Length (cms)	No. of Cases (%)
0.5-1.0	8 (20%)
1.1-2.0	22 (55%)
2.1-3.0	10 (25%)

Table-1: Site & length of Stricture

Procedure	No. of Cases	Post Urethroplasty Outcome
VIU	5	4/5 stricture free
Railroading	3	1/3 stricture free
Urethroplasty	1	Failed redo surgery
No treatment SPC delayed primary repair	32	29/32 stricture free

Table-2: Previous surgical procedure

Cause	Re-stricture cases	%
Post inflammatory (n=6)	1	16.66%
Post traumatic (n=34)	6	17.64%
Stricture Location	Re-stricture cases	%
Bulbar (n=15)	3	20%
Bulbo-membranous (n=25)	4	16%

Table-3: Correlation of stricture aetiology and location with results of stricture

Procedure done	Stricture length	Results (No./%)
Simple anastomosis with urethral mobilization	0.5 cm-2.0 cm	32 (80%)
Corporal separation	2.5 cm	3 (7.5%)
Inferior Pubectomy	3.0 cm	4 (10%)
Transpubic transperineal	1.0 cm	1 (2.5%)
Total		40 (100%)

Table-4: Correlation of type of maneuver with result of surgery

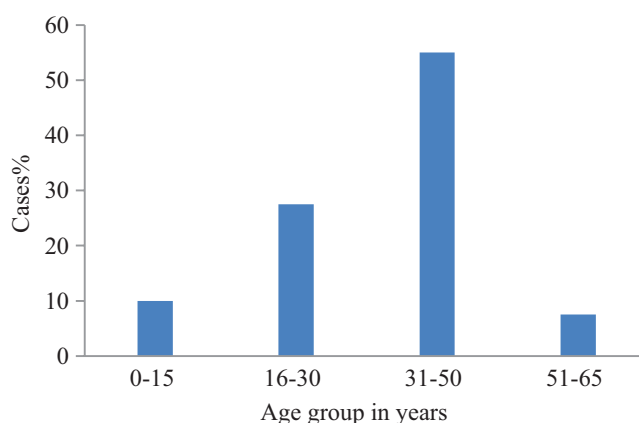


Figure-1: Age Distribution of cases

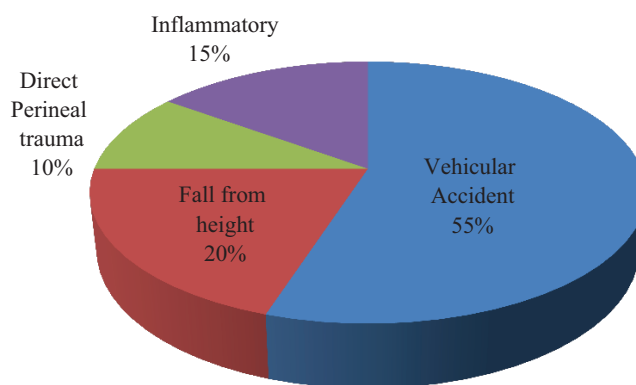


Figure-2: Etiology of urethral strictures cases

approach 100% in bulbar urethral stricture whereas it approaches around 84% in bulbo-membranous strictures. Table 4 shows that out of 40 patients, urethra mobilization by incising the bulbar attachment to the perineal body and distal mobilization upto panoscrotal junction was adequate for tension free anastomosis in 80% cases. This was done for stricture upto 2.0 cm and successful results were seen in 30 patients (93.75%). Two patients required VIU after 3-6 months. Both of them stabilized after VIU achieving a cure rate of 100%.

DISCUSSION

This study spanning a period of seven years consisting of 40 consecutive cases of single stage end to end urethroplasty was carried out at one of the leading postgraduate institute of Mumbai, in urology unit. Out of the 40 cases, 7 patients underwent SPC scopy and Expression Cystogram under General Anaesthesia as the posterior urethra was not visualized on MCU due to non-opening of bladder neck. In these 7 patients, expression cystogram was able to give an exact site and length of stricture helping us to plan preoperatively the maneuver required for tension free anasthosis.

Mundy⁶ and Webster⁷ have not employed Expression cystogram in patients where posterior urethra was not visualized. In patients where bladder neck did not open, they did intra-operative Suprapubic Cystoscopy to define the exact extent of the stricture. By passing a curved lister bougie through SPC tract, they were able to decide about

the manoever required in each patient. In contrast to them, we have employed expression cystogram in seven patients where posterior urethra was not opacified. All the patients in our series had a SPC done immediately in emergency sitting following trauma. 72% patients had a trocar SPC done and 28% patients had SPC done outside. A ordinary trocar SPC is adequate in cases of urethral trauma with distended bladder. Other series have followed the same protocol regarding management of traumatic stricture. All the series have employed SPC with delayed primary repair after 3-6 month of trauma. We have also done the repair 3-6 months after trauma.

Out of the 40 patients, there were 4 (10%) children whereas 36 (90%) belonged to the age group 16-50 years. This indicates that disease is more prevalent in young active man and highlights the enormous burden urethral stricture disease puts on the economies of the country leading to loss of manpower and productivity.

In this series 30% patients had associated pelvic fracture. Various series have reported associated pelvic fracture ranging from 7 to 40%. Turner Warwick⁸ has aptly described the importance of good judgment in patients with urethral disruption injury. He stated "It is the urologist who will have to bear the burden of ultimate disability with the patient when the thoracic, abdominal and even other orthopedic aspects are long forgotten."

In present study, the most common site of stricture was bulbo-membranous region (62.5%) followed by stricture in bulbar region (37.5%). Analyzing the results as per the site of stricture, in bulbo-membranous stricture 16% patients had re-stricture whereas 84% has successful results. In bulbar structure 20% had anastomotic stricture which was managed with VIU thus successful outcome was seen in 80% patients. After VIU, these three strictures were stabilized. The results of bulbar as well as bulbo-membranous region were similar suggesting that a good tension free anastomosis is the key for successful outcome and the site of stricture may not be so significant.

Out of 40 patients, urethral mobilization was enough in 32 (80%) patients. In these patients, length of urethral stricture was in the range of 1.5-2.5 cm mainly in bulbar region. Successful outcome was seen in 28 patients, out of which 4 required VIU. Average time required for surgery was 2.5 hrs and average blood loss was 250 ml. In 3 patients, corporal separation was required; the length of stricture was in the range of 1.5-3.0 cms, present mainly in bulbo-membranous region. Successful outcome was seen in 2/3 patients. One patient developed re-stricture and he had undergone urethroplasty outside and was managed with VIU. The additional time required for the procedure was 20 min and blood loss was 200 ml. Inferior pubectomy was done in 4 patients and success rate was 50%. Two patients develop complication, one developed a urethra-cutaneous fistula with anastomotic stricture and a perineal urethrostomy was done. The other had anastomotic site stricture and was managed with VIU. Additional time required for this maneuver was 15-20 min. Blood loss was 100 cc more.

In the series presented by AR Mundy⁹, simple anastomosis after urethral mobilization was done in urethral stricture of 1.5-2.0 cm length. Success rate of almost 100% were seen. Crural body separation for stricture length of 1.5-4.5 cm was done. Successful results were seen in 91% patients. They managed all their failures with buccal mucosal onlay procedure. Inferior pubectomy was done for stricture length of 1.5 -6.5 cm. Their success rate was 93%. They also employed corporal rerouting for stricture of 2-7 cm with success rate of 87%. They did not give blood transfusion to any of their patients. The results in our series are slightly inferior but not statistically significant. This may be due to the fact that 4/7 failures in this series were seen in patients who had some procedure prior to urethroplasty. This may also be because ours is a teaching institute and different surgeons have performed these surgeries. In the series by AR Mundy, all surgeries were performed by him.

Out of the 25 patients with bulbo-membranous stricture, 12 patients had erectile dysfunction preoperatively. All these patients had associated pelvic fracture suggesting that distraction injury and severity of trauma plays an important role in erectile dysfunction. On comparing our result with study done by Allen F Morey¹⁰, we found that incidence of erectile dysfunction was 26% in his series as compared to 48% in our series. In a study by Joseph N Corriere¹¹, the incidence of erectile dysfunction after posterior urethral distraction injury was 48% which improved after urethroplasty to 33% at one year. In our study 2/12 (16.6%) patients were able to achieve erectile function sufficient for intercourse. In series by Allen Morey¹⁰ potency was regained in 13% of patients. Various studies report this figure to be in 3-17% range. However the quality of erection was inferior compared to erection before trauma.

We followed the entire patients at quarterly interval for a period of one year and subsequently one year interval. On each visit, a complete history and focused examination was performed along with uroflowmetry. If required, a urethroscopy was done. We observed that uroflow and patient history do not correlate at times and uroflow is not a very sensitive tool to assess urethral patency as the stream is not reduced until the UFR < 12ml/sec. Hence retrograde urethrography along with urethroscopy should be done to reveal the exact status of urethra. Mundy, Webster and rest all now commonly do flexible urethroscopy at 6 months after urethroplasty because the anastomotic site stabilizes after 6 months. They follow their patients 6 monthly with uroflowmetry for one year. This stricture rate after one year is negligible as fibrosis is complete at 6 months.

Gerald H Jordan et al. follow their patients following Urethroplasty with flexible Urethroscopy. They believe that post operative RGU is at times misleading specially in anterior urethral stricture disease. The success rate in world literature after end to end urethroplasty are as reported in various series:

Study	Success rate after urethroplasty
Mundy AR	96%
Webster	94%
Mandoub K	93%
Keith	6%
Daniel	75%
Rachrburn C	65%
Our series	82.5%

We believe that a careful and complete excision of the scar tissue along with a wide spatulated mucosa to mucosa anastomosis is a key to successful outcome. Merely dilating the scar and anastomosing the scarred urethra eventually leads to failure. These scars do not respond to internal urethrotomy as they are associated with significant spongiofibrosis. However anastomotic site stricture after complete scar excision is usually a mucosal ring stricture and it responds to VIU. Netto et al reported a success rate of 72% after VIU in anastomotic strictures.

CONCLUSION

Present study shows that commonest cause of urethral stricture is vehicular accident followed by fall from height and most common site for stricture was in bulbo-membranous urethra. Majority (80-90%) of patients got good results along with less post-operative complications (re-stricture etc) with end to end urethroplasty provided a widely spatulated end to end tension free anastomosis along with excision of strictured segment is carried out. Therefore single stage anastomotic urethroplasty is the gold standard treatment in all cases of blind ending stricture of urethra and also in very narrow stricture where VIU has failed.

REFERENCES

1. Jackson MJ, Sciberras J, Mangera J et al. Defining a patient reported outcome measure for urethral stricture surgery. *Eur Urol.* 2011;60:60-8.
2. Santucci RA, Joyce GF, Wise M. Male Urethral Stricture Disease. *J. Urol.* 2007;177:1667-74.
3. Kumar NA, Chaitanya SV, Pinni S, Goyal N et al. Management of stricture urethra: our experience at a tertiary care center. *International Journal of Contemporary Medical Research.* 2020;7:D1-D5.
4. Wiegand LR, Brandes SB. The urethral stricture score: A novel method for describing anterior urethral stricture. *J Can Urol Assoc.* 2012;6:260-4.
5. Micheli E, Ranieri A, Peracchia G, Lembo A. End to end urethroplasty: long term results. *BJU International.* 2002;90: 68-71.
6. Mundy AR. Urethroplasty for posterior urethral stricture. *BJU.*1996;78:243-47.
7. Webster GD, Ramon J. Repair of pelvic fracture urethral defect using an elaborate perineal approach: experience with 74 cases. *J. Uro.* 1991;145:744-8.
8. Warwick T. Urethral stricture surgery. Current operative surgery-urology. London: balliere Tindall. 1988;160:218.
9. Mundy AR. The treatment of sphincter strictures.

*BJU.*1996;64:626-28.

10. Morey AF, Mcaninch JW. Reconstruction of posterior disruption injuries: outcome analysis in 82 patients. *J Uro.* 1997;157: 506-10.

11. Corriere JN. 1-stage delayed bulboprostatic anastomotic repair of posterior urethral rupture: 60 patients with one year follow up. *J Urol.* 2001;165:404-7.

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