

Success rate and complications of different urethroplasty techniques at a single center in Pakistan

Rashid Hamid, Mohammad Khan, Manzoor Hussain, Hasan Askari, Altaf Hashmi, SAH Rizvi, Muhammed Mubarak

Abstract

Received:
17th June 2016

Accepted:
2nd January 2017

Objective: To determine the success rate and complications of different urethroplasty techniques at a single tertiary care center in Pakistan.

Materials and methods: All consecutive patients who underwent various types of urethroplasty at Sindh Institute of Urology and Transplantation (SIUT), from January 2010 to August 2015 were included in this study. Urethroplasty techniques were divided according to the site. Short-term success rate and complications were noted. Data was retrieved from the case files and entered and analyzed on SPSS version 10.0.

Results: A total of 467 patients underwent various urethroplasty techniques during the study period. The mean age was 32.01 ± 13.35 years (range: 14 to 67 years). Regarding the location of the strictures, 167 (35.7%) were PFUDD, 201 (43%) bulbar, 64 (13.7%) penile and 35 (7.4%) pan urethral strictures. The overall success rate in PFUDD was 84.4% (141/167), in bulbar strictures, 89.0% (179/201), in penile, 93.7% (60/64) and in pan urethral strictures, 71.4% (25/35). The success rate according to type of urethroplasty showed that EPA for anterior urethral stricture had success rate of 96.1% (99/103), for posterior urethral stricture, 94% (157/166). In BMG urethroplasty, the success rate was 93.2% (124/133), in genital skin flap success rate was 87.1% (34/39) and in abdominal wall skin grafting the success rate was 84.0% (21/25). The complications varied according to the type of urethroplasty. EPA urethroplasty had lowest complication rate, i.e., 8.7%, especially when done for short bulbar stricture, while complication rate increased to 13% in EPA urethroplasty done in PFUDD. The hospital stay ranged from 2-5 days.

Conclusions: The success rate of various type of urethroplasty in our institute is comparable with other tertiary care centers in the world.

Keywords: Urethral stricture, urethroplasty, complications, graft, urethral dilatation, direct vision internal urethrotomy (DVIU)uu

Introduction:

Urethral stricture is a high volume disease and constitutes 4-5% of urology workload at Sindh Institute of Urology and Transplantation (SIUT), Karachi, Pakistan.¹ Road traffic accidents constitute the commonest cause of urethral stricture and disruption. The management includes urethral dilatation, direct vision internal urethrotomy (DVIU) and urethroplasty.² Urethroplasty is a complex procedure and not every urologist performs it.³ Indeed, all too often, patients with recurrent strictures un-

dergo multiple urethrotomies, despite its poor success rate.⁴ Urethral stricture disease is commonly found in males and its management has undergone change over time from regular dilatation, direct visual urethrotomy to urethroplasty, which has proven to be the best primary intervention for the disease. The best results reported from various studies of urethroplasty made us think of more in favor of urethroplasty with curative intention rather than as a palliative procedure.

Sindh Institute
of Urology and
Transplantation (SIUT)

Karachi

R Hamid

M Khan

M Hussain

H Askari

A Hashmi

SAH Rizvi

M Mubarak

Correspondence:

Prof. Muhammed Mubarak

Professor of Pathology

Department of

Histopathology,

Sindh Institute of Urology

and Transplantation,

Karachi-74200, Pakistan,

Email: drmubaraksiut@

yahoo.com

Tel: (009221) 99215752

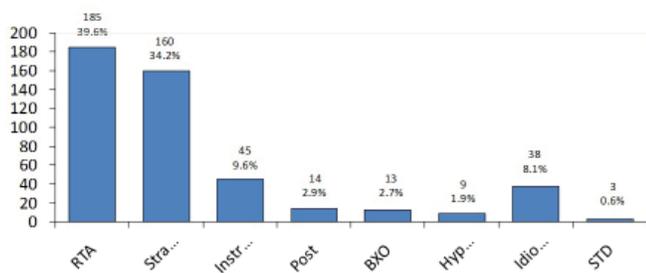


Figure 1. Etiology of the benign urethral strictures

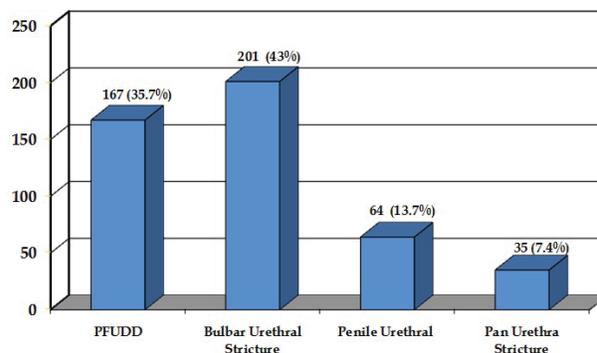


Figure 2. Distribution of the site of the benign urethral strictures

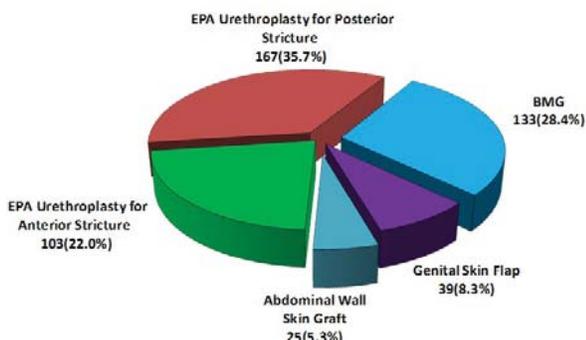


Figure 3. Various types of urethroplasty done for benign urethral strictures

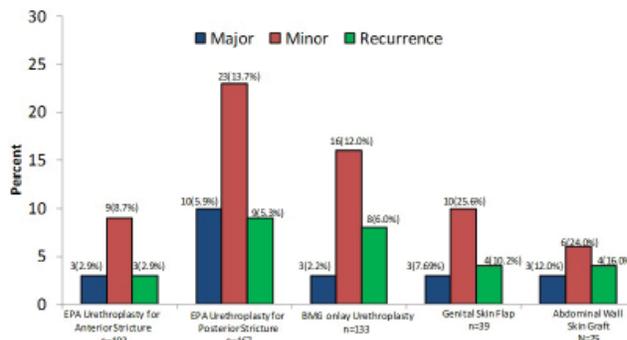


Figure 4. Various complications and recurrence rates of urethral strictures according to type of urethroplasty

The objective of this study was to determine the success rate and complications of different urethroplasty techniques at our institute.

Patient and Methods:

All consecutive patients who underwent various types of urethroplasty at SIUT, Karachi, Pakistan from January 2010 to August 2015 were included in this study. Urethroplasty techniques were divided according to the site of stricture, i.e., penile, bulbar, posterior urethral and pan urethral stricture, based on of pre-operative urethrogram and urethrocystoscopy. The study was retrospective in nature and involved retrieval of data from case files of patients. Written informed consent was obtained from patients prior to the operative procedure. The study was done according to ethical guidelines as laid down in the Declaration of Helsinki.

In the penile urethroplasty, buccal mucosa graft (BMG) and penile skin flaps were used as a patch. In short bulbar stricture, excision and primary anastomosis (EPA) and for more than

3 cm length, BMG urethroplasty was done. For pan urethral strictures, abdominal wall skin grafting was used as lateral onlay graft urethroplasty. In pelvic fracture urethral distraction defect (PFUDD), EPA urethroplasty with or without extra maneuvers were used for repair. In cases of excision of the stricture, the excised tissue was sent for histopathological examination. After discharge, these patients were followed up in stricture clinic of the institute with history, examination and uroflowmetry (UFM). If Qmax was less than 10 ml/sec, urethroscopy was advised. Success was defined as no outflow obstructive symptoms and Qmax more than 15 ml/sec.

The data items were entered and analyzed by SPSS version 10.0. Simple descriptive statistics were used for computing the continuous and categorical data.

Results:

A total of 467 patients underwent various urethroplasty techniques during the study period.

The mean age was 32.01 ± 13.35 years (range: 14 to 67 years). The etiology of urethral strictures is shown in Figure 1. As is apparent from this figure, the road traffic accident (RTA) is the single most common cause of stricture urethra in this study, followed by straddle injury to the groin areas. Regarding the location of the strictures, 167 (35.7%) were PFUDD, 201 (43%) bulbar, 64 (13.7%) penile and 35 (7.4%) pan urethral strictures, as shown in Figure 2. Various urethroplasty techniques employed are shown in Figure 3. The overall success rate in PFUDD was 84.4% (141/167), in bulbar strictures, 89.0% (179/201), in penile, 93.7% (60/64) and in pan urethral strictures, 71.4% (25/35). The success rate according to type of urethroplasty showed that EPA for anterior urethral stricture had success rate of 96.1% (99/103), EPA for posterior urethral stricture had 94% (157/166) success rate. In BMG urethroplasty, the success rate was 93.2% (124/133), in genital skin flap success rate was 87.1% (34/39) and in abdominal wall skin grafting the success rate was 84.0% (21/25). Histopathological examination was done in 37% of cases and showed benign scar tissue. No evidence of tuberculosis or tumor was seen. Various complications and recurrence rates are shown against the site of stricture and type of urethroplasty are shown in Figure 4. The hospital stay ranged from 2-5 days.

Discussion:

This study describes the short-term success rate and complications of different urethroplasty techniques according to different sites of urethral stricture at one tertiary care urological center in Pakistan. Although all age groups can be affected by urethral stricture disease, but in our study, the mean age was 32.01 ± 13.35 years. The exact incidence and prevalence of the disease in general population in Pakistan is unknown but the reported incidence from the West is around 8-10 cases/million population.⁵

Out of a total of 467 patients, 167 (35.7%) had PFUDD, 201 (43%) had bulbar urethral stricture, 64 (13.7%) had penile urethral stricture while 35 (7.4%) had pan urethral stricture. Trauma is more common in younger age group.⁶

The increasing frequency of the disease in older population (>60 years) shows more cases of trauma due to prostate surgery (transurethral resection of prostate [TURP] or open surgery) as a cause of stricture urethra.⁷ RTA leading to PFUDD was the commonest cause seen in 185 (39.6%) patients in this study. This reflects the increasing incidence of trauma in this country, which is in contradiction with reports from Western literature which showed iatrogenic/instrumental trauma as the commonest cause seen in 32-79% of cases.^{8,9} Fall astride, fall from the ceiling or wall or occupational trauma is the second most common cause constituting 160 (34.2%) patients, which showed trauma is the most common cause of stricture in our series.

Initial management of acute trauma at this institute is by suprapubic cystostomy, followed by delayed repair. After suprapubic cystostomy, antegrade and retrograde urethrogram is done under local or general anaesthesia, also accompanied by rigid or flexible urethrocystoscopy from above and below to see the site, the length of stricture and associated abnormalities of bladder, but many cases in the series were referred from all over the country with previous history of rail-road catheterization, DVIU, dilatation and failed urethroplasty.

Urethroplasty technique may be determined by the causative agent, the site and the length of stricture. Excision and primary end-to-end anastomosis (EPA) was done in 270 (57.8%) patients because of short bulbar urethral stricture i.e. 1-3 cm of length. Our study confirmed the excellent surgical results with EPA. This is based on the favorable pathology of short stricture.¹⁰ Strictures longer than 3 cm and with previous history of rail-road catheterization, DVIU, dilatation and failed urethroplasty, indicate the need for substitution graft or flap. At our institute, oral buccal mucosa is used as the favorite substitution graft because it allows the most diverse techniques. In 133 (28.4%) patients, we used BMG for urethroplasty. Despite the increasing use of BMG, it has its limitations when dealing with very long or pan urethral strictures. At our institute, genital skin flap and abdominal wall skin grafting is

done for treatment if the stricture is longer than 10 cm. In our study, genital skin flap was used in 39 (8.3%) patients. Abdominal wall skin was taken as graft in 25 (5.3%) patients.

The overall success rate varied by the urethroplasty type and the site of the stricture. In PFUDD, 141 out of 167 (84.4%) were successful. In bulbar stricture, the success rate was 179 out of 201 (89.0%) for EPA urethroplasty. In penile stricture, 60 out of 64 (93.7%) had success rate while in pan urethral stricture, 25 out of 35 (71.4%) had success rate. The success rate according to type of urethroplasty showed that EPA for anterior urethral stricture had success rate of 96.1% (99/103), EPA for posterior urethral stricture had 94% (157/166) success rate. In BMG urethroplasty, the success rate was 93.2% (124/133), in genital skin flap success rate was 87.1% (34/39) and in abdominal wall skin grafting the success rate was 84.0% (21/25). Our success rates are more or less similar to those reported recently from around the world 11-17.

The complications varied according to the type of urethroplasty. EPA urethroplasty had lowest complication rate, i.e., 8.7%, especially when done for short bulbar stricture, while complication rate increased to 13% in EPA urethroplasty done in PFUDD. Minor complications included bleeding in 2.2%, fever in 3.4%, wound infection in 7% and scrotal swelling in 6%. In 2.9% patients, major complications occurred, i.e., chordae and erectile dysfunction. Recurrence of stricture was seen in 3 (2.9%) patients. In BMG urethroplasty, overall complication rate was 12.0% and recurrence of stricture was noted in 8 (6.0%) patients. In genital skin flap and abdominal wall skin grafting, overall complication rate was 20% and recurrence of stricture was seen in 10.2% and 16.2% patients, respectively. Our complications rates are also low as reported recently by other investigators from around the world 11-17.

Conclusion:

The success rate of various types of urethroplasty in our institute is comparable to that reported

from other urology centers in the world. The success rate for EPA gives the best results and should be used whenever possible. BMG is the gold standard for substitution urethroplasty. Penile skin flap can also be used as a salvage procedure in which BMG is not available. Abdominal wall skin graft provides adequate supply of good material for long strictures with acceptably good results.

Conflict of interest: None

Funding source: None

Role and contribution of authors:

Dr Rashid Hamid, wrote the initial writeup after collecting the data.

Dr Mohammad Khan, helped in collecting the data also collected references and helped in discussion writing

Dr Manzoor Hussain, critically analyzed the study and reviewed the discussion and results.

Dr Hasan Askari, helped in collecting the data and references and also helped in discussion writing

Dr Altaf Hashmi, critically reviewed the article and made the necessary changes and discussion and the result writing

Dr SAH Rizvi, went through the whole article, critically review the article and made the necessary changes

Dr Muhammed Mubarak, conceived the idea, collected the data with other doctors, critically review the article and gave the final touchup.

References:

1. Hussain M, Soomro R, Hashmi A, Hussain Z, Naqvi A, Rizvi A. Urethral stricture disease: a review of 100 cases. *Pak J Surgery* 1997;13(3): 117-19.
2. Hussain M, Askari H, Lal M, Naqvi SA, Rizvi SA. Experience at a stricture clinic in a developing country. *J Pak Med Assoc.* 2013 Feb;63(2):234-8.
3. Van Leeuwen MA, Brandenburg JJ, Kok ET, et al. Management of adult anterior urethral stricture disease: Nationwide survey among urologist in the netherland. *Eur Urol* 2011;60:159-

- 166.
4. Santucci R, Eisenberg L. Urethrotomy has a much lower success rate than previously reported. *J Urol* 2010;183:1859-1862.
 5. Mundy AR. Transperineal bulbo-prostatic anastomotic urethroplasty. *World J Surg* 1998;16:164-70.
 6. Brandes S, Borrelli J. Pelvic fracture and associated urologic injuries. *World J Surg* 2001;25:1578-87.
 7. Santucci RA, McAninch JW, Mario LA, Rajpurkar A, Chopra AK, Miller KS et al. Urethroplasty in patients older than 65 year. Indication, result outcome and suggested treatment modification. *J Urol* 2004;172:201-3.
 8. Lumen N, Hoebake P, Willemseam P. Etiology of urethral stricture disease in the 21st century. *J Urol* 2009;182:983-7.
 9. Fenton AS, Morey AF, Aviles R, Garcia CR. Anterior urethral stricture: etiology and characteristics. *Urology* 2005;65:1055-7.
 10. Andrich DE, Mundy AR. What is the best technique for urethroplasty? *Eur Urol* 2008;54:1031-1041.
 11. Lucas ET, Koff WJ, Rosito TE, Berger M, Bortolini T, Neto BS. Assessment of satisfaction and Quality of Life using self-reported questionnaires after urethroplasty: a prospective analysis. *Int Braz J Urol*. 2017 Mar-Apr;43(2):304-310.
 12. Zhou SK, Zhang J, Sa YL, Jin SB, Xu YM, Fu Q, Lazzeri M. Etiology and Management of Male Iatrogenic Urethral Stricture: Retrospective Analysis of 172 Cases in a Single Medical Center. *Urol Int*. 2016;97(4):386-391.
 13. Vasudeva P, Nanda B, Kumar A, Kumar N, Singh H, Kumar R. Dorsal versus ventral onlay buccal mucosal graft urethroplasty for long-segment bulbar urethral stricture: A prospective randomized study. *Int J Urol*. 2015 Oct;22(10):967-71.
 14. Siegel JA, Panda A, Tausch TJ, Meissner M, Klein A, Morey AF. Repeat Excision and Primary Anastomotic Urethroplasty for Salvage of Recurrent Bulbar Urethral Stricture. *J Urol*. 2015 Nov;194(5):1316-22.
 15. Aboutaleb H. Role of the urethral plate characters in the success of tubularized incised plate urethroplasty. *Indian J Plast Surg*. 2014 May;47(2):227-31.
 16. Soliman MG, Abo Farha M, El Abd AS, Abdel Hameed H, El Gamal S. Dorsal onlay urethroplasty using buccal mucosa graft versus penile skin flap for management of long anterior urethral strictures: a prospective randomized study. *Scand J Urol*. 2014 Oct;48(5):466-73.
 17. Kluth LA, Dahlem R, Reiss P, Pfalzgraf D, Becker A, Engel O, Chun FK, Fisch M, Ahyai SA. Short-term outcome and morbidity of different contemporary urethroplasty techniques--a preliminary comparison. *J Endourol*. 2013 Jul;27(7):925-9.