Complications following Urethral Reconstructive Surgery: A Seven Year Experience at Tertiary Care Centre

Vikash Jhunjhunwala[1], Raghvendra Gupta[2], Anoop Singh[3]

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. Complication rates were determined, and subgroups were categorized based on stricture etiology, length of stricture, location of stricture and type of repair.

Results: Complication rates were seen in 22% and 16.4% of patients with inflammatory stricture and traumatic stricture respectively. When stricture was located in bulbar region, complication rate was 20% and it was 16% in cases of bulbo-membranous stricture. In 23 (57.5%) cases, no complication was observed and in 7 (17.5%) cases, anastomotic stricture developed. Six cases (15%) showed wound infection and in 2 (5%) cases, permanent erectile dysfunction developed.

Conclusions: Complications following reconstructive surgery for urethral stricture disease were mostly related to stricture recurrence or wound infection.

Keywords: Urethral Stricture, Complications, Urethroplasty, Recurrence

INTRODUCTION

In the treatment for urethral stricture disease, reconstructive urethral surgery has been shown effective and acceptable results.[1-3] Studies done by various authors also found complications after or during urethral reconstruction surgery. Andrich et al. reported complications ranged from 7% to 33% following reconstructive urethral surgery.[1] Study done by Al-Qudah et al.[4] found high complication rates (48%) although most complications were classified as minor.

Stricture recurrence is the most common complication of urethral dilation or urethrotomy. Other complications of urethral dilation and urethrotomy include major bleeding, infection, rectal injury etc. The most common complication of urethroplasty is recurrence of stricture. Although stricture recurrence rate following urethroplasty is lower in comparison to following urethral dilation or DVIU.

Stricture recurrence is defined as return of urethral strictures following thought to be a successful treatment. In case of band-like strictures, simple incision can be helpful, but in extensive narrowing cases, treatment can be very troublesome.

Compartment syndrome is one of the serious complications of positioning-related urethral stricture surgery. This is a surgical emergency and must be treated immediately. Treatment consists of making deep, long incisions in the legs (called fasciotomies) to relieve the pressure.

In some cases, sexual dysfunction such as decreased erection rigidity has been reported after urethral stricture surgery. Fortunately, this is temporary and in most of the cases, there is resolution within 6 months. Some other complications are bleeding, infection, tightness with erections and dribbling etc. Reconstructive urethral surgery is always associated with some risk but if it is properly performed then these risks are very low. The risk of a particular complication is highly related to surgeon expertise and to some extent, equipment and instrumentation.

We assessed our experience with 40 consecutive cases of single stage end to end urethroplasty over a 7-year period by a single surgeon within the same institution. A retrospective review of all urethral reconstructions, complications and recurrences over a 7-year period was performed. Aim of present study is to determine the overall incidence and specific type of complications that can occur during or after a variety of urethral reconstructive procedures.

MATERIAL AND METHODS

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

[1]Assistant Professor, Department of Surgery, Prasad Institute of Medical Sciences, Lucknow (U.P.), [2]Associate Professor, Department of Neurosurgery, GSVM Medical College Kanpur (U.P.), [3]Assistant Professor, Department of Surgery, Government Medical College Banda (U.P.), India

Corresponding author: Dr. Raghvendra Gupta, Associate Professor, Department of Neurosurgery, GSVM Medical College Kanpur (U.P.), India

How to cite this article: Jhunjhunwala V, Gupta R, Singh A. Complications following urethral reconstructive surgery: a seven year experience at tertiary care centre. International Journal of Contemporary Medical Research 2021;8(1):A11-A14.

DOI: http://dx.doi.org/10.21276/ijcmr.2021.8.1.32

urethral stricture and had undergone staged urethroplasty were excluded from the study. All patients underwent single stage perineal end to end urethroplasty using a number of maneuvers to aid in a mucosa to mucosa tension free anastomosis.

Post-operative Management

1. Restricted mobility for 4 days in cases of perineal end to end urethroplasty.
2. Patients were kept on injectable antibiotics for 24 hours after which they were switched to oral broad spectrum antibiotic cover till the catheter was removed.
3. Oral anti-inflammatory and pain killers were given for 1 week.
4. Corrugated drain was removed when there was no soakage.
5. SPC was clamped and removed at 3 weeks.
6. Urethral stent was removed after the SPC tract healed (3-4 days).

Follow Up

Before discharging the patient, Uroflowmetry was done in all patients. 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

Table 1 show that 5 patients had undergone two or more VIU before urethroplasty was done. Out of which 4 patients (80%) had no post operative complication and were considered cure at one year of follow up. One patient (20%) 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, out of which 2 patients (66%) developed anastomotic stricture within 6 months after urethroplasty. Thirty two patients underwent a end to end primary delayed urethroplasty. All patients had a pre-operative SPC done and 3 patients (9.3%) developed anastomotic stricture. They were all managed with VIU and all these strictures were stabilized after one or two VIU.

Table 2 shows complication data which was stratified by the etiology of strictures and stricture locations. In our series, complication rates were seen in 22% and 16.4% of patients with inflammatory stricture and traumatic stricture respectively. When stricture was located in bulbar region, complication rate was 20% and it was 16% in cases of bulbo-membranous stricture.

Table 3 and figure 1 shows the distribution of overall complications for the anastomotic urethral reconstructive cases. In 23 (57.5%) cases, no complication was observed and in 7 (17.5%) cases, anastomotic stricture developed. Six cases (15%) showed wound infection and in 2 (5%) cases, permanent erectile dysfunction developed.

Re-stricture was seen in 7 patients. Out of these, two had undergone railroading and one underwent urethroplasty. In 1, urethral stent accidentally came out on 3rd post-operative day leading to urinary leak. He was re-catheterized under GA after urethroscopically railroading a urethral stent over a guide wire. A peri-cather-o- gram, after three weeks of catheterization showed extravasation of contrast. Urethral stent was kept for 4 weeks and removed after there was no urinary leak seen on MCU. He developed anastomotic site stricture within three months which was managed with VIU and has a follow up of 8 months (UFR-15.4 ml/sec).

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. We sought to describe complications following 40 consecutive reconstructive procedures for urethral stricture disease and impact of these on disease recurrence. Complete understanding of complications following various available procedures for stricture disease is essential for appropriate patient counseling. We included all complications (major and minor) without discrimination. In Mamdoch Koraitim series,[5] author evaluated 100 patients with pelvic fracture and urethral injury for various methods of emergency management comparing suprapubic catheterization with delayed repair, primary realignment and primary re-suturing. His results were:

Complication	Surgical Procedure		
	SPC / Delayed repair	Primary re-alignment	Primary suturing
Stricture rate	97%	53%	43%
Incontinence	4%	5%	21%
Impotence	19%	36%	56%

He advised it against primary suturing as immediate treatment of ruptured urethra.In another study from China by Sun-Ying Mao et al. used primary realignment in treatment of bulbar urethral injury following straddle injury. They reported a better success rate with lesser rate of impotence and incontinence. It could reflect the very nature of injury where chances of bladder neck injury and damage to neurovascular bundle is less in comparison to urethral distraction injury. They believe that primary realignment in posterior urethral injury as well anterior urethral injury decreases the stricture rate as well as lessens fibrosis and future stricture length.

Study done by Navai N et al.[2] shows that the complication rate for anastomotic and substitution urethroplasty in their study was 9% and 17%, respectively and comparison of these two groups did not show a statistical difference (p = 0.19); however, a similar trend of complications following primary anastomosis and substitution urethroplasty has been previously reported in study done by Anrich DE et al.[6]

About 10-15% complication rates has been associated with high lithotomy position for urethral reconstructive surgery.[7-10] In study done by Navai N et al.[2] complications related to the high lithotomy position were occurred only in 2.2% cases. The majority of complications in our series were related to anastomotic re-stricture (7/40) followed by wound infection

(6/40). Studies done by various authors[2, 11-13]reported wound infection rates for similar procedures including perineal prostatectomy (1.6%), circumcision (1.3%) and hydrocele repair (4%).

Finally, we evaluated the chances of stricture recurrence following urethral reconstructive surgery. Stricture recurrence rate of 17.5% was observed in present study which is similar to study done by Barbagli G et al.[14] and Wood DN et al.[15] Study done by Nelson Netto et al. showed re-stricture rate following end to end urethroplasty was 10% among children. However our series had small number of paediatric patients and more studies are required to comment on the outcome of end to end urethroplasty in this age group. 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 Morey[14], 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 Corriere,[15] 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 Morey 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.

Previous studies have reported an increased incidence of impotency after urethroplasty. This could be due to damage to the neurovascular bundle during urethral dissection. Thus a through preoperative evaluation of the cause of erectile dysfunction is required before surgery is undertaken. All patients should be counseled prior to surgery about the possible worsening of ED. Following urethroplasty an additional 4 patients developed ED. Two had a temporary ED which improved after 1 year and 2 had permanent ED. In the series AR Mundy, erectile dysfunction increased by 33% after urethroplasty. In 26%, it was temporary and in 7% permanent ED was seen. However this was a contrast in comparison to a series by Allen Morey in which the percentage of ED reduced after urethroplasty in 13% patients. Two patients in our study had minor post-operative urinary leak at the anastomotic site. There was no urethro-cutaneous communication in these patients. Both the leak developed within 7 days postoperatively. Catheter was kept for additional 1 week in these patients. A pericatheter or gram was done prior to removal of catheter. When no leak or extravasation of contrast was visualized, urethral stent was removed. Both these patients developed re-stricture at anastomotic site for which VIU was done after three months. Thus extravasation of urine early after urethroplasty may increase the chance of rest enosis.

In this study, 6 patients developed superficial wound dehiscence. They were managed with regular dressing and antibiotics according to culture and sensitivity report. In all these patients, secondary suturing was done after wound was healthy. In our series wound infection rate is higher 15% as compared to just 3% in a series by Allen Morey. This could probably reflect better sterilization facility and weather

Procedure	No. of Cases	Procedures with complications (%)
VIU	5	1 (20%)
Railroading	3	2 (66%)
SPC + delayed primary repair	32	3 (9.3%)

Table-1: Complication rate by type of previous urethral stricture repair

Etiology	Total Patients	Complications (%)
Inflammatory	9	22%
Trauma	31	16.4%
Stricture Location		
Bulbar	15	20%
Bulbo-membranous	25	16%

Table-2: Complication rate by etiology of stricture and stricture location

Complication	No. of cases with %
None	23 (57.5%)
Wound infection	6 (15%)
Anastomotic stricture	7 (17.5%)
Permanent erectile dysfunction	2 (5%)
Anastomotic leak	2 (5%)

Table-3: Types of Complications for Surgical Repair

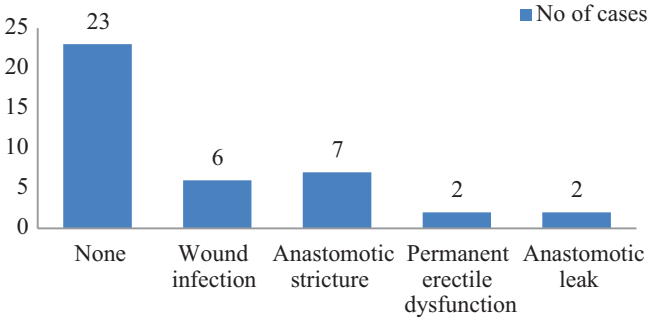

Figure-1: Types of complications for surgical repair

Procedure done	Stricture length	Procedures with complications (%)
Simple anastomosis with urethral mobilization	0.5 cm-2.0 cm	4 (12.5%)
Corporal separation	2.5 cm	1 (33.3%)
Inferior Pubectomy	3.0 cm	2 (50.0%)
Transpubic transperineal	1.0 cm	0 (0.00%)

Table-4: Complication rate by type of urethral stricture repair

conditions in their country.

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.The re-stricture rate varies from 7 to 35% in various series. In our study good long term results were seen in 90% of the patients. However the results of our series cannot be compared to other series as the criteria for successful outcome are different in different series. Mundy et al. compared long term results of end to end single urethroplasty with onlay urethroplasty for bulbar stricture and found stricture rate as:

Urethroplasty	1 Year	5 Year	10 Year
Anastomotic	7	12	12
Onlay	12	20	30

Mundy concluded that end to end urethroplasty has best long term results with least re-stricture as compared to onlay procedures which have a progressively increasing failure rate. Our study shows a similar success rate of 82.5% after end to end urethroplasty. After one or two VIU in patients with anastomtic stricture, the overall success rate increased to 90%.

CONCLUSION

The most common complication seen after surgery is re-stricture which can be successfully managed with a combination of VIU/UD in majority of the patients. Erectile dysfunction is seen in 48% of patients with trauma. The majority had permanent ED reflecting the damage to neurovascular bundle. 16% had temporary ED and could be managed with conservative treatment. All patients should be warned of the small but definite risk of post surgery permanent ED prior to the procedure. Single stage anastomotic urethroplasty is the gold standard treatment in all cases of blind ending stricture of urethra.

REFERENCES

1. Andrich DE, Dunglison N, Greenwell TJ, Mundy AR: The long-term results of urethroplasty. J Urol. 2003; 170: 90-2.
2. Navai N, Erickson BA, Zhao LC, Olcotic O T, Gonzalez CM. Complications following Urethral Reconstructive Surgery: A Six Years Experience. International Braz J Urol. 2008; 34: 594-601.
3. Santucci RA, Mario LA, McAninch JW: Anastomotic urethroplasty for bulbar urethral stricture: analysis of 168 patients. J Urol. 2002; 167: 1715-9.
4. Al-Qudah HS, Santucci RA: Extended complications of urethroplasty. Int Braz J Urol. 2005; 31: 315-23; discussion 324-5.
5. Mamdouh M Koraitim. Effect of early realignment on length and delayed repair of post-pelvic fracture urethral injury. Urology. 2012;79:912-5.
6. Andrich DE, Mundy AR: Urethral strictures and their surgical treatment. BJU Int. 2000; 86: 571-80.
7. Anema JG, Morey AF, McAninch JW, Mario LA, Wessells H: Complications related to the high lithotomy position during urethral reconstruction. J Urol. 2000; 164: 360-3.
8. Angermeier KW, Jordan GH: Complications of the exaggerated lithotomy position: a review of 177 cases. J Urol. 1994; 151: 866-8.
9. Bildsten SA, Dmochowski RR, Spindel MR, Auman JR: The risk of rhabdomyolysis and acute renal failure with the patient in the exaggerated lithotomy position. J Urol. 1994; 152: 1970-2.
10. Moses TA, Kreder KJ, Thrasher JB: Compartment syndrome: an unusual complication of the lithotomy position. Urology. 1994; 43: 746-7.
11. Krieger JN, Bailey RC, Opeya J, Ayieko B, Opiyo F, Agot K, et al.: Adult male circumcision: results of a standardized procedure in Kisumu District, Kenya. BJU Int. 2005; 96: 1109-13.
12. Audry G, Johanet S, Achrafi H, Lupold M, Gruner M: The risk of wound infection after inguinal incision in pediatric outpatient surgery. Eur J Pediatr Surg. 1994; 4: 87-9.
13. Jakse G, Manegold E, Reineke T, Borchers H, Brehmer B, Wolff JM, et al.: Expanded, radical perineal prostatectomy. Urologe A. 2000; 39: 455-62.
14. Morey AF, Mcaninch JW. Reconstruction of posterior disruption injuries: outcome analysis in 82 patients. J Uro. 1997;157: 506-10.
15. 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.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 30-12-2020; **Accepted:** 20-01-2021; **Published:** 31-01-2021