

Anastomotic Urethroplasty in Patients of Pelvic Fracture Urethral Distraction Defect: Outcome Analysis in 35 Patients

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Abstract

Aim : To review the records of patients at our center who underwent anastomotic urethroplasty for posterior urethral distraction defect with a focus on short and long-term outcomes to assess the efficacy of this approach.

Methods : Records of 35 patients who underwent posterior urethral reconstruction were reviewed who presented with posterior urethral distraction defect to our center from 2014 to 2018.

Results: Only excision of fibrosis and simple perineal anastomosis was performed in 10 patients (28.6%), crural separation was also needed in 12 patients(34.2%)while inferior pubectomy was also required in 13 patients (37.14%) to attain a tension-free anastomosis. Anastomotic urethroplasty alone was successful in 25 cases (71.4%). Seven patients(20%) required endoscopic urethrotomy after urethroplasty. In 3 patients (8.5%) urethroplasty ultimately failed and they remained untreated. Overall, long-term success was observed in 32 patients (91.4%).

Conclusions: Anastomotic urethroplasty remains the cornerstone in the management of urethral distraction defect . A spatulated, wide caliber, mucosa-to-mucosa anastomosis is essential. Subsequent optical internal urethrotomy usually provides durable relief of recurrent stenosis after posterior urethral reconstruction . Posterior urethral reconstruction does not significantly increase chances of impotence.

Key word: Anastomotic urethroplasty, posterior urethral distraction defect, pelvic fracture urethral distraction defect.

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I. Introduction

The posterior urethra is the part between the bladder neck and the bulbar urethra and includes the bladder neck, the prostatic urethra, and the membranous urethra surrounded by the internal and the external urethral sphincter mechanism.¹One of the most technically difficult problems in urology is the treatment of posterior urethral defects following pelvic fracture with urethral distraction . Distortions of normal lower urinary tract anatomy along with dense fibrosis , make surgical repair of these injuries difficult.^{1,2}Due to the difficulty of open posterior urethral reconstruction ,some minimally invasive therapies have recently been used as alternatives including core-through internal urethrotomy, immediate or delayed realignment with "cut-to-the-light" procedures, two-stage endo-urethroplasty and use of stents.³⁻⁶

We manage patients with posterior urethral disruption with immediate suprapubic cystostomy and delayed urethral reconstruction. We reviewed the records of 35 patients at our center with a focus on short and long-term outcomes to assess the efficacy of this approach.

II. Methods

40 patients with posterior urethral distraction defect presented to our center from January 2014 to June 2018. Records of 35 patients who underwent posterior urethral reconstruction were reviewed in an observational study.

Initial treatment.At the time of referral 29 patients (82.8%) had suprapubic catheter placed due to failed per urethral catheterization. After referral to our institution dilatation or further internal urethrotomy was not attempted before urethroplasty.

Preoperative evaluation. Retrograde urethrography with micturating cystography was done to assess the magnitude of urethral separation.

Operative management Standard perineal anastomotic urethroplasty was employed. The patient was placed in the social lithotomy position . The anterior urethra was exposed through a midline perineal incision, about 2 cm proximal to the anus, circumferentially mobilized proximally and transected at the distal margin of the stricture. A 30 F sound was passed through the cystostomy site and the tip was palpated at the site of the stricture. Fibrotic tissue was excised completely until the sound passed easily through the prostatic apex. Resection of periurethral scar tissue was done .The corpus spongiosum was mobilized distally upto the penoscrotal area and the bulbar urethral margin was debrided until it calibrated easily to at least 28F. 8 sutures of 4-0 monofilament polyglyconate were used to perform a spatulated anastomosis over a 16F silicone catheter. When the anastomosis was under tension, the corpora was sharply divided in the midline. Inferior pubectomy was done when required. Suprapubic cystostomy was maintained for 7 more days after the urethral catheter was removed at 21 days after a normal pericatheter retrograde urethrogram and the patient had voided normally. Drains were placed when required.

III. Results

Majority of the patients (77.1%) were between 18 to 40 years of age.The mechanism of injury in majority of patients was blunt trauma during a motor vehicle accident 28 (80%) while 5 (14.2%) were due to crush injury and 2(5.8%)were due to other causes. Most of the patients had multiple associated injuries. The most common associated injury was pelvic fracture in 32 patients (91.4%). Associated bladder ruptures were repaired with suprapubic cystostomy in 5 patients

Most common length of fibrosis observed was <2cm in about (23)65.7% and longer defects more than 2cm were seen in about about (12)34.3%. Only excision of fibrosis and simple perineal anastomosis was performed in 10 patients (28.6%), crural separation was also needed in 12 patients(34.2%)while inferior pubectomy was also required in 13 patients (37.14%) to attain a tension-free anastomosis.

Table 1 : Length of defect

Length	No of patients	Percentage
<1cm	10	28.5%
1-2cm	13	37.1%
2-3cm	7	20%
>3cm	5	14.2%

Table 2: Procedures done for tension free anastomosis

Procedure	No of patients	Percentage
Only end-end anastomosis	10	28.6%
End-end anastomosis + crural separation	12	34.2%
End-end anastomosis +crural separation+ inferior pubectomy	13	37.2%

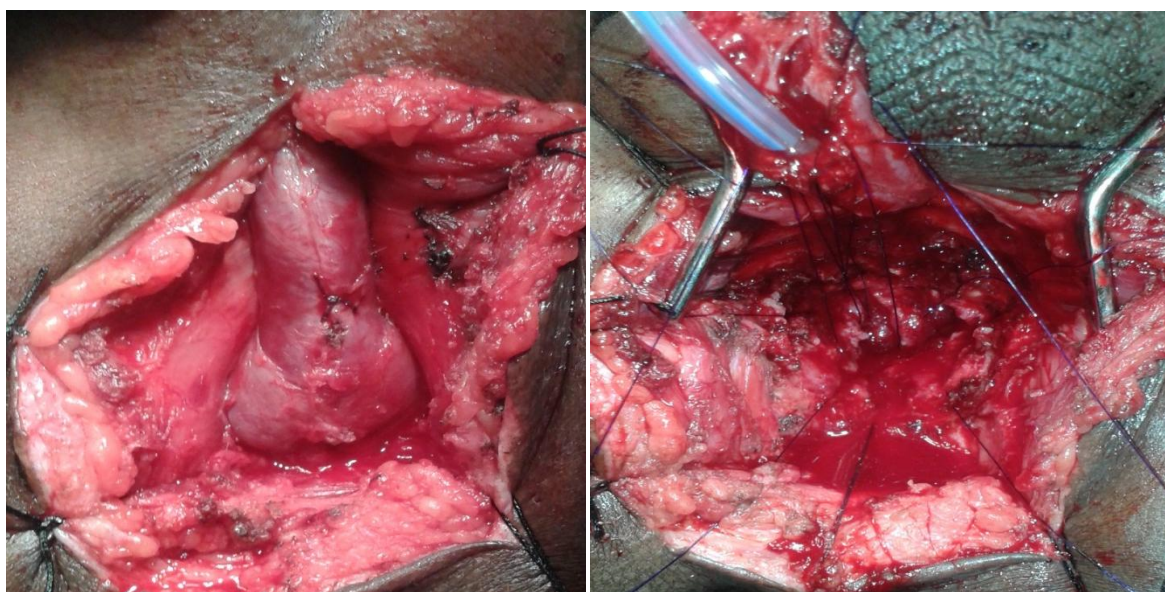
Median followup was longer than 1 year. Posttraumatic impotence changed from 60% before reconstruction to 65.7% postoperatively. Acceptable urinary continencewas achieved in 80% of patients. Anastomotic urethroplasty alone was successful in 25 cases (71.4%). These patients were able to void normally without need for subsequent dilation . Seven patients(20%) required endoscopic urethrotomy after urethroplasty. A soft mucosal web like narrowing in the area of the anastomosis was the usual finding endoscopically. While 4 of the 7 patients who underwent post urethroplasty optical urethrotomy needed no further intervention , in 3 patients (8.5%) urethroplasty ultimately failed and they remained untreated. Overall, long-term success was observed in 32 patients (91.4%).

Follow up	No of patients	Percentage
Acceptable continence	28	80%
Anastomosis alone successful	25	71.4%
Post operative endoscopic urethrotomy	7	20%
Redo urethroplasty	2	5.7
Delayed failure	3	8.5%
Overall long term success	32	91.4%

IV. Discussion

Delayed reconstruction after urethral disruption is usually done under elective conditions when the patient has recovered from major associated injuries. Immediate repair of urethral defects is difficult and is usually not done. Suprapubic catheter placement at the time of initial injury is an effective emergency technique that does not interfere with treatment of associated life threatening injuries.

Posterior urethral reconstruction is one of the most challenging clinical problems for an urologist. The pathogenesis of these defects is different from that of most anterior urethral strictures. With urethral disruption urethral ends become separated and the intervening defect is replaced with fibrosis and urethral continuity is interrupted. Very few centers in India have experience with open urethral reconstruction in large numbers of patients. Success rates of end-to-end anastomosis in several large series of anastomotic prostatic membranous urethroplasty range from 80 to 95%. In a recent study Qiang Fu et al concluded that in 301 delayed transperineal bulboprostatic anastomosis procedures, 263 (87.4%) were successful and 38 (12.6%) were unsuccessful. In this study simple perineal anastomosis without ancillary procedures reflected an 89.3% success rate, perineal anastomosis with separation of the corporeal body had an 86.5% success rate, perineal anastomosis with inferior pubectomy had an 84.2% success rate, and perineal anastomosis with urethral rerouting had an 85.7% success rate.⁷ It can be concluded that urethral anastomosis should initially be attempted by a perineal approach alone. Inferior pubectomy is adequate in most instances when some form of pubectomy is indicated. Distal mobilization of the corpus spongiosum with corporeal separation when necessary, precludes any form of pubectomy. Rerouting the urethra around a corporeal body to provide additional length was not required in any of our patients. Most disruption defects were less than 2 cm long and direct anastomosis without pubectomy was adequate. Complete excision of periurethral fibrosed tissue is the most important step for achieving a successful outcome from posterior urethral reconstruction. Stay sutures placed in periurethral fibrosed tissue provide excellent control during stricture excision, and these sutures may be sequentially excised until normal-appearing tissue surrounds the urethral mucosa .



Distal mobilization of the corpus spongiosum from the corpora cavernosa is another step that decreases tension on the suture line. Persistent fibrosis around the affected area prevents any long-term success with endoscopic treatment . Consequently , the majority of patients treated primarily by endoscopic methods will require multiple repeated instrumentations.⁸⁻¹⁰ Some have favored early or immediate endoscopic realignment,^{11,12} long-term results do not appear to differ significantly from those obtained with delayed endoscopic methods.¹³ On the contrary, endoscopic treatment of recurrent strictures after open urethral reconstruction is highly successful. Mostly, recurrent strictures after open posterior urethroplasty are narrow mucosal rings. As the surrounding fibrosis is already excised, the chances for success are much greater.¹⁴ Potency changed from 60% before urethral reconstruction to 65.7% postoperatively. Most reports confirm impotence rates close to the range in our series.¹⁵ Even patients who do not undergo any prostatic or periurethral manipulation after posterior urethral disruption appear to have similar rates, thus it can be concluded that long-term prognosis for erectile function depends more on the magnitude of the injury than the form of treatment.¹⁶

V. Conclusion

Anastomotic urethroplasty remains the cornerstone in the management of urethral distraction defect , even in previously failed repairs, provided adequate resection of fibrotic tissue from the defect is done until proximal calibration is accomplished easily. Further to decreases tension on the suture line, liberal mobilization of the urethra, corporal separation or inferior pubectomy may be required. A spatulated, wide caliber, mucosa-to-mucosa anastomosis is essential. Subsequent optical internal urethrotomy usually provides durable relief of recurrent stenosis after posterior urethral reconstruction because the surrounding fibrosis is greatly reduced. Failing endoscopic treatment ,a redo urethroplasty is required in some cases. Posterior urethral reconstruction does not significantly increase chances of impotence.

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