Comparision of Optical Urethrotomy with Perineal Urethroplasty in the Management of Traumatic Blind Posterior Urethral Stricture

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ABSTRACT

Aims: To assess the efficacy, safety and complication of optical urethrotomy in traumatic blind posterior urethral stricture, and compare results with perineal urethroplasty.

Study design and setting: A prospective study of 40 cases of blind traumatic urethral stricture was conducted at the department of urology, Services Hospital Lahore from Feb: 1997 to March 1999.

Results: Majority of the patients (32) were in the 2nd to 4th decade of life. Most cases (30) belonged to the urban areas and the common site was membraneous urethra. Road traffic accident (36) and fall from height (3) were the commonest causes of stricture development. Twenty cases were treated with optical urethrotomy and 20 by urethroplasty. Although results of perineal urethroplasty were good (77.5%) as compared to optical urethrotomy (68.5%) but statistically no significant difference observed between two groups (P=0.257). The difference between morbidity, mean peak flow rate and mean residual urine was also insignificant. There was significant difference between two groups in terms of operative time, mean hospital stay and blood transfusion.

Conclusions: It is recommended that optical urethrotomy may be used as a alternative procedure to urethroplasty in patients with blind traumatic posterior urethral strictures.

Key words: Optical urethrotomy, Perineal urethroplasty, Urethral stricture, Urologic surgical procedures.

INTRODUCTION

Management of posterior urethral injuries with pelvic fracture remains a major controversy and has always been a challenge. Despite the best judgement and surgical skills, stricture almost always develops1. Urethral dilatation is the oldest surgical procedure used for the periodic dilatation of Urethral stricture but there is risk of complications like haematuria, bacteremia, infection, false passage, and periurethral abscess and fistula2,3.

Before the first endourological repair reported by Sache in 1974, surgical urethroplasty was the only method available to restore urethral continuity. Stricture excision and end to end anastomosis was regarded as the gold standard for posterior urethral strictures4. Webster et al5 reported a 90% success rate5 while Osterlinck6 reported a success rate of 90% in end to end anastomosis of posterior urethral stricture. Despite complications of internal urethrotomy like recurrent stricture formation, haemorrhage, sepsis and rectal injury, an interest in minimally invasive surgery has prompted some of the investigators to attempt an endourological approach to this problem1.

The present study was undertaken to compare optical urethrotomy and perineal urethroplasty in two groups of patients with traumatic blind posterior urethral strictures.

PATIENTS AND METHODS

This prospective study was conducted at the department of Urology, Services Hospital Lahore from February 1997 to February 1999. Forty patients suffering from traumatic blind posterior urethral stricture were included in the study. Patients were divided into two groups A and B at random. Alternate patients were selected for urethroplasty and internal urethrotomy. Group A comprised of 20 patients who underwent internal urethrotomy and Group B comprised 20 Patients who underwent perineal Urethroplasty. Patients who made failure in-group A (internal urethrotomy) were treated with perineal urethroplasty.

Patients excluded from the study were those having history of neurological deficit, diabetes mellitus, congenital, iatrogenic, infective or malignant stricture and a stricture more than 2 cm long.
All the patients were subjected to detailed preoperative clinical assessment. Investigations carried out were TLC, DLC, ESR, and hemoglobin. Urinalysis, Blood grouping and cross matching, antegrade cystourethrogram and retrograde urethrogram.

After complete evaluation of patients the procedure was performed under general/spinal anaethesia. Patients of group A were placed in lithotomy (Lyoid Devis position) and were draped. A 21 Fr urethrotome sheath with zero degree telescope was passed into the urethra upto level of blind stricture and another 17 Fr cystoscope passed in a similar way through suprapubic cystostomy. Under the guidance of suprapubic cystostomy light, stricture was incised at 12’0 clock in a gradual manner with the help of cold Knife till urethrotome was reached into urinary bladder thus making continuity between the anterior and posterior urethra. Urethrotome was removed and sheath retained. A 16 Fr two way Foley catheter was passed into bladder through this sheath. Another two way Foley catheter was passed suprapublically after removing cystoscope. Suprapubic catheter was clamped after the procedure. Per urethra catheter was removed after two weeks and retrograde urethrogram was performed. If urethrogram showed no stricture, suprapubic catheter was removed.

In patients of group B one staged perineal urethroplasty was performed, in which stricture excision and end to end anastomosis through perineal approach with or without removal some portion of pubic bone was done. The operative details included a midline perineal incision of skin. The subcutaneous fat and bulbocavernous muscle were divided in the midline to expose the bulbar urethra. This stricture was dissected away from the corpora cavernosa distally as far as the penoscrotal junction. The proximal end of bulbular urethra was than traced proximally towards the strictures at the level of pelvic diaphragm. The dissection being kept as close as possible to the midline to prevent further impairment of sexual function by dividing bilaterally the cavernosal branches of the pudendal arteries as they enter the corpora just below the pelvic floor. The distal urethra and surrounding spongiosus was then freed by transection at the level of the stricture. In bulbar anastomosis repair, the mobilized distal urethra depends on a retrograde blood supply derived from .the dorsal penile arteries via glans and perforating vessels from the corpora cavernosa, which supply the pendulous portion of the urethra.

The perineal dissection was then continued in the midline with excision of stricture until the apex of prostate was clearly visualized. The apical prostatic urethra was then widely spatulated in preparation for the bulboprostatic anastomosis over a 16 Fr catheter. The anastomosis, which is technically demanding, was performed with three or six interrupted 3/0 vicryl sutures. Accurate suture placement is critical to prevent re-stenosis or extravasation of urine, a suction drain was inserted, and wound was closed in layers. Drain was removed after 48 hours and Foley’s catheter retained after two weeks. All patients were advised to visit the department at 1 month and 3 months for follow-up.

The criteria used to assess the success of the both procedures:

a. Good
1. Patient voids as before the injury.
2. Retrograde urethrogram showing patent tube with no evidence of narrowing at the level of the stricture.
3. Flow rate is more than 15 ml/sec.

b. Fair
1. Patient void with some difficulty, stream is thin and intermittent.
2. Retrograde urethrogram shows patent but irregular and decrease in diameter at the level of the stricture and requires self-dilatation.

c. Poor
1. Voiding is so affected that patient is unable to pass urine in a stream.
2. Retrograde urethrogram shows definitive narrowing at the stricture site.
3. Flow rate is lesser than 10/ml/sec.

RESULTS

Forty patients with traumatic blind posterior urethral stricture were included in this study. Thirty-seven patients were available for follow up for a period for three month. The results of the study are summarized in Table 1.

Thirty (81.1%) patients belonged to urban areas while 7 (18.9%) were from rural areas. Ages of the patients ranged from 14 to 65 years with a mean age of 33.1±12.3 years. The peak incidence of traumatic blind posterior urethral stricture was from 20-39 year of age. Thirty patients (81.1 %) received urethral injury as a result of road traffic accidents, 3(8.1%) due to fall from height and 1 (2.7%) because of gunshot injury. All patients presented with suprapubic cystostomy and had history of retention of urine and urethral bleeding following injury. Fracture of pelvis was seen in 26 (7.3%) patients and all had blind posterior urethral strictures in
dynamic retrograde urethrogram. The duration of urethral injury ranged from 15 days to 6 years with majority (81.1%) having the problem of urethral injury for one month to one year. Five patients (13.5%) had history of urethral dilatation, 3 (8.1%) had optical urethroscopy, 2 (5.4%) railroad catheterization and 1 (2.7%) had history of perineal urethroplasty.

Table 1: Post operative data of group A (Optical Urethrotomy) and group B (Perineal Urethroplasty).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group A (Mean ± SD)</th>
<th>Group B (Mean ± SD)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean peak flow rate at one month and three months</td>
<td>19.38±2.63 17.28±1.57</td>
<td>19.86±1.41 17.46±2.71</td>
<td>P=0.10 (Insignificant)</td>
</tr>
<tr>
<td>Mean residual urine at one month and three months</td>
<td>16.54±16.33 22.69±18.48</td>
<td>12.86±9.95 17.14±13.05</td>
<td>P=0.10 (Insignificant)</td>
</tr>
<tr>
<td>Operative time</td>
<td>27.5±13.46 56.5±24.24</td>
<td>1084±231.57</td>
<td>P=0.001 (Significant)</td>
</tr>
<tr>
<td>Cost of operation (Rupees)</td>
<td>304.65±134.29</td>
<td>9.0±1.26</td>
<td>P=0.001 (Significant)</td>
</tr>
<tr>
<td>Mean hospital stay (Days)</td>
<td>2.65±1.25</td>
<td>9.0±1.26</td>
<td>P=0.001 (Significant)</td>
</tr>
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</table>

In group A 19 patients and in group B 18 patients were available for follow-up. Following optical urethrotomy, 9 (47.4%) patients had good results and 4 (21.1%) had fair result. The overall success rate was 68.5% while 6 (31.5%) patients were declared as failure. One patient (5.3%) developed fever with rigor, endoscopic knife broke in 1 patient (5.3%) and one patient (5.3%) had server bleeding. After optical urethrotomy one patient became impotent and one had stress incontinence. Recurrence of urethral strictures in this group occurred within period of three months in 3 (15.8%) patients. The overall morbidity rate was 42.2%.

DISCUSSION

Upto mid twentieth century, urethral dilatation and blind internal urethrotomy remained the treatment of choice for the posterior urethral strictures and for impassable stricture. Suprapubic cystostomy was the only alternative. Modalities of treatment like urethral dilatation and road techniques are more or less absolute because of poor efficacy and inherent complications. In 1953 Johnson introduced his two staged urethroplasty, which was later used by Turner- Warwick and Blandy et al. In modified way. At the same time larger number of one stage procedure were also introduced including badenoch pull through operation, excision and end to end anastomosis through perineal and transpubic approaches. These procedures were so successful that hundreds of patients were relived from suprapubic cystostomy. Two stage procedures involve considerable inconvenience and greater expense but they are specifically for long strictures. One stage end anastomosis has reduced the morbidity with good results. Despite complications of perineal urethroplasty success rates are between 66-95%.

Urethroplasty was the only method available to restore continuity before endourological repair. Sachse introduced visual urethrotome in 1974 which was considered as a break through in the management of urethral strictures. Complication of this procedure are rare and success rate is 56-85%.

In our study, 30(81%) patients belonged to urban areas and 7(18.9%) belonged to rural areas. Hussain et al also reported that majority of patients belonged to the rural areas. The peak incidence of traumatic blind posterior urethral stricture was between 20-39 years of age. High incidence of urethral strictures in third and fourth decades has also been reported in other studies which are comparable to our study. In our study, fracture of pelvis was seen in 26(70.3%) patients while incidence of pelvic fracture ranges from 76-80% in other series, which is comparable with our study. The duration of urethral injury ranged from 15 days to 6 years. Majority of patients presented with problem of urethral injury from one month to one year. Same range of duration has been
reported by others, which is comparable to our study. In our study, overall success rate in group A (optical urethrotomy) and group B (perineal urethroplasty) was 68.5% and 77.8% respectively and the difference was insignificant. Similar results have been reported in other studies which show 56-85% and 66.95% success rate respectively.

The morbidity rate in group A and group B was not significant (P=0.25). In another series morbidity rate ranged form 25.55% after optical urethrotomy and 20.61% after perineal urethroplasty respectively. Their results are comparable to our study.

The recurrence of urethral strictures in group A was 26.2% and in group B 16.7% respectively within period of three months, similar results have been reported in other series which have a recurrence rate of 25.40% in optical urethrotomy and 20.35% in perineal urethroplasty.

In our study all patients were continent and sexually potent before injury. After injury three patient (8.1%) developed erectile dysfunction while after surgery one patient in each group developed erectile dysfunction and became incontinent which was comparable to other studies where the incidence of erectile dysfunction after trauma was 2.5-60%. The incidence of incontinence in our study was seen in 2 (5.4%) patients, one patient in each group which is similar to other studies of 5-10%.

Mean peak flow rate at one month in group A was 19.38±2.63 ml/sec and in group B was 19.86±1.41 ml/sec. Similarly at three months in group A mean peak flow rate was 17.28±1.57 ml/sec and in group B was 17.46±2.17 ml/sec. Difference of peak flow rate was statistically insignificant. In other studies peak flow rate after optical urethrotomy has been reported as high as 17 to 25 ml/sec while in studies using perineal urethroplasty mean peak flow rate ranges from 18 to 26 ml/sec. These results are comparable to our study.

Mean residual urine at 1 month and 3 months after optical urethrotomy was 16.54 ml and 22.69 ml respectively, while in perineal urethroplasty, it was 12.86 ml and 17.14 ml respectively which was insignificant both statistically and ultrasonologically. Wilbert et al also noted insignificant residual urine. The operative time in group A and group B was 27.5±13.46 and 56.5±14.24 minutes respectively and was significantly less in group A (P≤0.001). Hussain et al and Mark et al also reported less operative time in optical urethrotomy then perineal urethroplasty. Cost is major factor as majority of patients who came to teaching hospitals belonged to the poor socio-economic group. Mean estimated cost of operation was Rs. 304±134.29 in group A and 8 Rs.1084±231.57 in group B. This difference was because of use of vicryl suture during repair, use of antibiotics and longer hospital stay in group B. Hussain et al) and Ali and Shukry reported cost effectiveness of group B than group A which is similar to our study. Other workers have also reported cost effectiveness of internal urethrotomy versus urethroplasty. In our study the hospital stay of patients undergoing optical urethrotomy was significantly less as compared to perineal urethroplasty (P ≤0.0009) similar results have been reported by others.

Statistical analysis showed insignificant difference between group A and B in the success rate, morbidity and mean peak flow rate but significant statistical difference in the operative time, cost of operation, blood transfusion and hospital stay. The morbidity rate of open surgery can be avoided in 61 % of patients. Hospital stay, loss of work morbidity and related complications are also markedly decreased with endoscopic therapy. Workers have reported that endoscopic reconstruction of urethral occlusion avoids extensive surgery, and is particularly useful for surgeons who lack experience with urethroplasty, and patients who refuse or are poor candidate for urethroplasty. Moreover endoscopic procedure is effective, simple, safe, repeatable, inexpensive and minimal invasive and it does not require special sophisticated guiding instruments.

**REFERENCES**