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Antegrade and Retrograde Endoscopic Manipulation of a Complete Posterior Urethral Stricture

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ABSTRACT

Purpose: We present our experience in doing an antegrade-retrograde maneuver in the form of cut-to-light or cut-to-sound in treating complete posterior urethral strictures.

Patients and Methods: Between April 2005 and November 2011, 31 patients out of 99 with posterior urethral strictures underwent endoscopic urethral dilation using ureteroscopes (UR) through suprapubic cystostomy and internal urethrotome reterogradely through the urethra. Their ages ranged between 16 to 70 years (mean: 35) and were caused by a car accident in 19 patients, fall astride in 4, gunshots in 3, iatrogenics in 4, and bomb explosions in 1. The length of the stricture was 4 to 10 mm (mean: 7.6).

Result: Operative time ranged between 20 to 70 minutes (mean: 37.74) and blood transfusion was needed in 2 patients. Cut-to-light was performed in 20 while cut-to-sound was performed in 11. Hospital stay ranged between 1 to 3 days. Catheter stay time was 2 to 4 weeks (mean: 2.4). Twenty-seven patients passed urine smoothly after removal of the catheter, and during a period of observation (10 days), 2 needed transurethral resection of the prostate (TURP) to pass urine strongly, so the success rate is 93.5%. Within 3 to 6 months, another 4 patients needed dilation so the success rate decreased to 80.6%. Another 2 needed dilation after 2 years, so the success rate dropped to 74.2%. Complications were in the form of bleeding in 2 patients and rectal injury in 1. Follow-up ranged between 3 and 24 months.

Conclusion: Antegrade-retrograde visual-internal urethrotomy is safe under supervision of the procedure in complete urethral strictures, so it is more or less acceptable. It markedly decreased operative time, hospital stay, and cost.

INTRODUCTION

Urethral injury is often described as rare in the literature [1,2]. It is frequently seen in our locality because of road traffic accidents and wide-spread use of weapons among people. Traditionally, suprapubic cystostomy at the time of urethral injury with delayed urethroplasty 3 to 6 months later is the standard method of treatment [3,4]. Cut-to-light technique has been used by Leonard and colleagues [5] as a less-invasive procedure, but Turner-Warwik and others have disputed this procedure because of its blind nature and high complication rates [6,7].

We present our experience in doing antegrade cystoscopy using the ureteroscope (URS) to guide the urethrotome inserted reterogradely using cold-knife biopsy in the form of cut-to-light or using suprapubic sound in the form of cut-to-sound.

PATIENTS AND METHODS

KEYWORDS: Antegrade-reterograde, posterior urethral stricture, urteroscope

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Between April 2005 and November 2011, 31 patients out of 99 with complete posterior urethral stricture underwent endoscopic antegrade-retrograde urethrotomy procedure (ARUT) after authorized approval in the Urology and Nephrology Center in Al-Thawra Hospital. The patients and stricture demographic data are in Table 1. The procedure was done under general anesthesia 3 to 6 months after trauma. We inserted the semirigid ureteroscope through the suprapubic cystostomy and examined the bladder and posterior urethra for any pathology, such as a stone or tumor, and saw an impassable stricture that was distal to the verumontanum in all cases. Then reterogradely we inserted a 21 F urethotome to the site of complete obliteration. With the retrograde light off and only the antegrade light on, we could see the light that appears as a red halo with a yellow spot. In the case of cut-to-sound, movement of the sound is our guide when performing our cut.

When performing cut-to-light procecures, the main surgeon cuts to the light (yellow spot) with a cold knife while the second surgeon gives feedback Once the surgeon feels the knife and once we see the URS, we continue to cut until the hole becomes wide enough that the second surgeon can pull the URS, followed by the urethotome. If this becomes difficult, we insert a 0.038 guide wire reterogradely through the urethotome and pull antegradely. We then widen the opening and finally enter the bladder. With our case, we found stones in 6 patients in the prostatic urethra so we dilated the tract and inserted the nephroscope to remove the stones. Finally, a silicone catheter was inserted through the guide wire.

RESULTS

The mean operative time ranged between 20 to 70 minutes (mean: 37.4) and the maneuver was cut-to-light in 20 patients and cut-to-sound in 11 patients. A blood transfusion was needed in 2 patients. The hospital stay was 1 to 3 days while catheter placement time was 2 to 4 weeks (mean: 2.4). Twenty-seven patients passed urine smoothly after removal of the catheter and during observation (10 days) period, and then the suprapubic was removed (87.09%). Two patients passed urine for a few days and then needed dilatation; the other 2 patients (65 and 70 years old) needed transurethral resection of the prostate (TURP) before micturation, with a maximum urine flow rate between 16 and 25 ml/sec (mean: 20.23). Success reached 93.5%. Within 3 to 6 months, another 4 patients needed dilatation and the success rate dropped to 80.6%. Another 2 needed dilatation after 2 years and the success rate became 74.2%. Complications were in the form of postoperative bleeding in 2 patients and rectal injury in 1 patient, which was managed conservatively by leaving the suprapubic cystostomy in place 1 week after the removal of the urethral catheter. Follow-up ranged between 3 months and 24 months.

Table 1. Demographic data of the patients and stricture.

Number of patients	31
Age	17 to 70 (mean: 35)
Stricture	
Length	4 to 10 mm (7.6)
Site	
Bulbomemb	27
Bulbous	4
Aetiology	
Car accident	19
Full astride	4
Gunshot	3
Iatrogenic	4
Bomb explosion	1
Maneuver	
Cut-to-light	20
Cut-to-sound	11

DISCUSSION

With respect to the invasiveness of therapy for complete or impassible urethral stricture, there is a discrepancy between the different conventional procedures. Combined antegrade-retrograde endoscopic procedure could enlarge the field of indications for endoscopic urethotomy and the frequency of open urethroplasty could be reduced.

Some use the rigid cystoscope after dilatation of the cystostomy [8]; others use a flexible cystoscope [9,10] as a guide. Thomas and associates believe that using a laser fiber as a guide wire can be a viable and effective option for gaining access through strictures when alternative methods fail [11]. We used a semirigid URS (8-11 F) without the need for tract dilatation, except in 6 cases associated with stones for cut-to-light in 21 patients. We used a suprapubic dilator to cut to the sound in 11 patients, and we used an index finger in the rectum as a guide without the need for fluroscopy, which is sometimes used [12,13]. The main surgeon depended on the impression given by the assistant when he felt the cut of the cold knife, and concentrated on the halo spot (yellow) in the red field to cut through. Once we saw the tip of the URS, we inserted a guide wire retrogradely, which was picked up by the forceps of the URS to the cystostomy. From there, we continued cutting until the hole was suitable for entering into the bladder.

There is no consensus in regards to the time of intervention, such

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Figure 1. Combined ascending and micturating urethrocystogram (5 mm length bulbomembranous stricture).

as those done by Melakos [14] who performed the operation 1 to 3 days after trauma while Towler and Eisen recommended that it be done 2 weeks later before any significant fibsosis develops [13]. Marshall and associates mentioned that an interval of several months is a benefit in order to reach a stable state of scar formation [15], which is the same strategy followed in our case. We succeeded in reconstructing the urethra endoscopically in all the patients, and after removal of the catheter, 29 patients passed urine satisfactorily with good flowmetery save for 2 patients older than 60 years that needed TURP. Two patients developed a weak stream and needed dilatation, so the success rate reached 93.5%, which is considered excellent on short-term follow-up. The success dropped to 80.6% after 3 to 6 months and to 74.2% after 2 years, which is considered good in the intermediate follow-up. Our high success is related to the short length of the stricture (4 to 10 mm) (Figure 1), which was also observed in a limited number of previous studies [10,16].

We don't routinely use postoperative dilatation. We observed our patients for 10 days after urethral catheter removal and we resorted to dilatation only if the urine flow dropped to half although some advise routine self-catheterization as part of the treatment [17]. Complications are accepted and managed conservatively. Rectal injury occurred in 1 patient managed conservatively by leaving the superapupic cystostomy in place 1 week after removal of the urethral catheter. Centamycine and meteronidazole were prescribed. We took care in the next case by cutting more anteriorly to avoid this complication.

CONCLUSION

Antegrade-retrograde visual-internal urethrotomy is safe under supervision of the procedure in complete urethral strictures, so it is more or less acceptable. It markedly decreased operative time, hospital stay, and cost.

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