THE ROLE OF OPTICAL INTERNAL URETHROTOMY FOR MALE URETHRAL STRICTURE

Ekrem Akdeniz1, Mustafa Bolat1 and Necmettin Sahinkaya∗
∗Samsun Training and Research Hospital, Department of Urology, Samsun, Turkey

ABSTRACT

Introduction: Urethral stricture is characterized by a decrease in urethral flow severe enough to cause acute urinary retention. Urethral strictures may develop after traumas to the urethral epithelium and/or corpus spongiosum. Complication rates due to untreated urethral stricture are very high. Although various treatment methods have been described, the second most common method for urethral dilation in practice is cold knife internal urethrotomy. The purpose of this study is to evaluate data from patients who were treated with internal urethrotomy in our clinic. Methods: This study included patients who were treated with urethral urethrotomy due to internal stricture between January 2011 and May 2015. Demographic, clinical, radiological, uroflowmetric (maximum and mean urine flow rate) and relevant data of the patients were retrospectively evaluated and recorded. Results: This study included 155 patients with a mean (± standard deviation) age of 71.70 (± 13.7). Etiologically the most common reason was urological surgical procedures (67%), and the most common stricture was seen at bulbomembranous urethra region (85.2%). The mean length of stricture was 5.4 ± 2.4 mm. Mean duration to remove the catheter was 1.8 ± 1.3 days. Regional anesthesia was used in 67.7% of the patients. Our success rate was 78.1%. Comparison of maximum and mean urine flow rates pre- and postoperatively revealed significant increases postoperatively. Conclusion: Internal urethrotomy is a first line treatment method for urethral strictures because it is easily applied, has a low complication rate, and can be applied with local anesthesia in high-risk patients who are unable to take general anesthesia. Although recurrence rate is high, repeatability is its greatest advantage, and it causes significant relief in patients with urethral strictures, but it must be kept in mind that definitive treatment is urethroplasty.

KEYWORDS: Endoscopy, internal urethrotomy, urethral stricture

Introduction

Urethral Stricture (US) is a disease characterized by a decrease in urine flow sufficient to cause urinary retention [1]. It may be asymptomatic, or it may cause serious clinical findings like
prostatitis, epididymo-orchitis, hydronephrosis, periurethral abscess, infections, urinary system stone disease, fistula, sepsis, and renal failure [2]. Although it may occur as a complication of perineal trauma, inflammatory diseases like lichen sclerosus, or sexually transmitted diseases, it is most commonly iatrogenic [3]. The incidence of US is as high as 0.2-1.2 %, and its incidence markedly increases in males above 55 years of age [2].

Urethral stricture is known until ancient times, and its treatment is among the most difficult ones in Urology [4]. Treatment methods for urethral stricture are divided as endoscopic, and open surgeries, and treatment method varies according to localization, length, and shape of the stricture [1]. Internal urethrotomy is commonly used in urethral stricture treatment because it is simple, easily applied and postoperative recovery is fast [4]. The aim of internal urethrotomy is to dilate urethral lumen by cutting the stricture, and after recovery achieves a flow with higher output by establishing a wider lumen.

The purpose of this study is to evaluate retrospectively post-operative data of patients who had internal urethrotomy for urethral stricture to evaluate early results of internal urethrotomy.

Patients and Methods

After the ethics committee approval for our study, patients who had internal urethrotomy for urethral stricture between January 2011 and May 2015 were retrospectively evaluated. Demographic, clinical, radiological, uroflowmetric (maximum and mean urine flow rates) and relevant data of patients who gave informed consent preoperatively were recorded (Figure 1). Localization and length of urethral stricture were assessed with using 3 Fr ureteral catheters under direct vision, and Optical Internal Urethrotomy (OIU) was performed with 0 degree 21 Fr urethrotome. Inside stricture line, a 5-Fr guide wire or urethral catheter was pushed forward. The stricture was completely opened by withdrawing the cold-knife at 12 o’clock position, and an 18 Fr internal catheter was inserted. The patients were called for follow up at a third postoperative month. After the surgery, urinary flow rates were routinely measured.

Statistics

For statistical evaluation Statistical Package for Social Sciences version 15.0 (SPSS 15.0 Chicago, IL, USA) package program was used. For data analyzes, Mann-Whitney U test was used. All values were shown as mean ± standard deviation.

Findings

The study included 155 patients. The mean age of the patients was 71.70 ± 13.7 (26-91) years. Etiologically the most common reason was (66.4%) urological surgeries (cystoscopy, transurethral resection, ureterorenoscopy). Etiology of membranous urethral stricture due to urethral catheterization was in 6, and urological surgical intervention was in 55 patients. Of the 55 patients, 42 patient had a transurethral prostatectomy. After OIU in TURP group, insignificant incontinence was seen (1 pad/day).

Most strictures were seen at the region of the bulbomembranous urethra (85.2%). The mean length of the stricture was 5.4 ± 2.4 mm. The mean duration of the removal of the catheter was 1.8 ± 1.3 days. Spinal anesthesia was applied to 67.7% of the patients (Table 1). Mean and maximum urine flow rates were 3.8 ± 1.92 mL/sec and 8.4 ± 3.56 mL/sec preoperatively and 7.6 ± 3.25 mL/sec, and 14.1 ± 6.84 mL/sec postoperatively. Significant rises were detected for both values at the postoperative period (Table 2).

Discussion

The US is a disease commonly seen in urology practice, is known to ancient Egyptians, Greeks and Indians, and its treatment is still debated [4]. The US causes fibrotic scar formation that leads to urethral narrowing and significant voiding dysfunction. Voiding dysfunction may be asymptomatic, or it may cause significant clinical findings [2]. The most common etiology of urethral strictures is iatrogenic causes [3]. In our study, the etiology was iatrogenic in 81.9% of the patients. From this aspect,
Table 1 Demographic and clinical features of the patients

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<tr>
<td><strong>Number of patients</strong></td>
<td>155</td>
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<tr>
<td><strong>Mean age (years)</strong></td>
<td>71.70 ± 13.7 (26-91)</td>
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**Etiology of stricture (%,n)**

- Urological Surgical intervention 66.4 % (103)
- Urethral catheterization 15.5 % (24)
- Trauma 12.9 % (20)
- Primary 5.2 % (8)

**Length of stricture (mm)**

5.4 ± 2.4 mm (2-15)

**Region of stricture (%,n)**

- Bulbar urethra 45.8 % (71)
- Membranous urethra 39.4 % (61)
- Penile urethra 14.8 % (23)

**Anesthesia (%,n)**

- Local 17.4 % (27)
- Spinal 67.7 % (105)
- General 14.8 % (23)

**Time to removal of catheter (day)**

1.8 ± 1.3

our study is in parallel with previous studies. In 66.4% of our patients, urological surgeries caused the strictures. It should be remembered that this complication can be minimized by the use of appropriate technology and devices.

Although there are different methods for treatment of urethral strictures, treatment method changes according to location and size of stricture, and depth of the scar [5]. These treatments include urethral dilatation, urethral stents, laser urethrotomy, cold-knife urethrotomy, antifibrotic substance injections like Mitomycin C, urethroplasty, and perineal urethrostomies [6,7]. Cold-knife internal urethrotomy that was first described in 1974 by Sachse is the most common method for US treatment in the world [4,8].

In our study preoperative and postoperative mean urine flow rates were 3.8 ± 1.92 mL/sec and 8.4 ± 3.96 mL/sec, respectively. Dutkiewicz found mean flow rates as 3.24 ± 2.03 mL/sec and 6.52 ± 3.56 mL/sec [9]. In our study preoperative and postoperative maximum urine flow rates were 7.6 ± 3.25 mL/sec and 14.1 ± 6.84 mL/sec, respectively. Dutkiewicz found maximum rates as 5.80 ± 4.09 mL/sec and 11.92 ± 6.84 mL/sec [9]. Jain et al. found maximum flow rates as 6.73 ± 1.87 mL/sec and 22.9 ± 3.51 mL/sec [4]. Uroflowmetric parameters were similar to the literature, and internal urethrotomy leads to a significant improvement at an early period.

Success rates of internal urethrotomy vary greatly, and long-term results are poor [1]. Early success rates vary between 8-80% and long-term success rates vary between 20-30% [6]. Our study revealed 78.1% success rate at the end of the third month. Recurrence rate within 5 years is 74-86% [10]. Several different classification systems are used to determine recurrence after treatment of US with internal urethrotomy. Among them, the length of the stricture, time to recurrence, presence of recurrent internal urethrotomy, presence of urethral catheter placed during the procedure, and performance of clean intermittent catheterization are the most commonly used parameters in classifications. In an important study that classified length of the narrowed segment into three groups as <2 cm, 2-4 cm, and >4 cm showed the recurrence rates within 12 years were 40%, 50%, and 80%. Also, the same study showed that with each 1 cm increase in stricture length recurrence risk increased 1.22 (95% CI=1.05-1.43) times [11]. In a study that evaluated bulbar, penile, and membranous strictures separately, recurrence rates were found to be 58%, 84%, and 89% respectively [12]. First six months is critical for recurrence and recurrence rate is highest in the first six months period [10]. The best candidates for OIU are patients whose stricture length is lower than 1.5 cm and located in the bulbar urethra [12].

The general complication rate for internal urethrotomy is 6.5%. In detailed evaluation erectile dysfunction was found in 5%, urinary incontinence in 4%, extravasation in 3%, hematuria in 2%, urinary system infection in 2%, epididymitis in 0.5%, urinary retention in 0.4%, and scrotal abscess in 0.3% [13]. No complication was observed in our study. This may be explained by our short follow-up period.

Small number of patients, retrospective study design and short time follow-up time are limitations of our study. Despite all of these limitations, we found identical results with the literature. Also, internal urethrotomy is performed in our clinic similarly by all the surgeons by comprehensive guidelines.

In conclusion, OIU is a surgical method that can be easily applied with local anesthesia, is simple, has a low rate of complication, and has a short recovery period. It is commonly used in urology practice due to such advantages. Its short-term success rate is very high, but the long-term success rate is relatively low. Although it is not an effective treatment in the long-term, it prolongs time to urethroplasty that is the golden standard treatment method of urethral stricture. In this regard, it resembles an
intermediate station. It may be the most consistent treatment in patients with a short life expectancy due to chronic diseases or malignancies. Although open urethroplasty is the gold standard ultimate good choice, internal urethrotomy is done routinely in urology clinics almost all over the world. Therapeutic outcomes should be evaluated in the principles of evidence-based medicine. Although it was defined in 1974 by Sachse, it is still the most commonly used method in the world. Moreover, therefore it is one of the essentials of urology. OIU seems to be irrevocable currently. So technology should not only search alternative treatment methods but also provide modifications that will increase long-term effects of internal urethrotomy.

**Authors' Statements**

**Competing Interests**

The authors declare no conflict of interest.

**References**


