
Unravelling the Role of Internal Optical Urethrotomy in Male Urethral Stricture Management

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Received: 28 October 2021

Accepted: 16 January 2022

Published: 24 February 2022

Abstract: *Background and aim: Male urethral stricture is still regarded as one of the most common and perplexing urological problems. Dilation, endoscopic urethrotomy, and urethroplasty are all options for treatment, however internal optical urethrotomy has a faster recovery time, less scarring, and a decreased risk of infection. The purpose of this study was to see how effective internal optical urethrotomy was in treating patients with urethral stricture. Materials and Methods: Between August 2020 and May 2021, the author at National institute of urology and nephrology, Cairo, Egypt, conducted this research. Internal ocular urethrotomy was used to treat a group of 18 male patients aged 22 to 51 who had urethral strictures. The follow-up time was between one and two months. The outcome was given a good, fair, or bad rating.*

Results: 44.44 % of the 18 patients were between the ages of 45 and 51. Trauma was the most common cause of stricture in 8 (44.4%) of patients, and poor urination was the most common presenting symptom in 6 (33.3%). The bulbous urethra was found to be the most common region of restriction in 9 (50%), followed by the penile urethra in 6 (33.3%) cases. The overall response rate was good in 12 individuals (66.7%). Only urethral hemorrhage was observed in 2 (11.1%) of the patients after surgery, with no additional significant problems.

Conclusion: Internal optical urethrotomy is a dependable and effective procedure in treating urethral stricture.

Keywords: *Urethrotomy, Penile, Urethral Stricture, Management*

1. INTRODUCTION

A urethral stricture is a scarred constriction of the urethra that prevents the lower urinary system from functioning properly [1]. The effects of this blockage can significantly reduce the patient's quality of life by producing micturition problems; they can even harm the whole urinary system, leading to renal failure. Strictures are separated into two types: anterior and posterior, which differ not only in location but also in the pathophysiology that causes them [2].

Adult lower urinary tract problems such as infection, acute urine retention, high voiding pressure causing secondary thickening and irritation of the bladder, diverticula or fistulas, and perineum abscess are all caused by urethral strictures [3]. Patients with urethral strictures frequently have obstructed emptying symptoms as well as urinary tract infections such as epididymis or prostate gland infections [4].



The first issue to ask is if the patient has urine retention or upper tract blockage, which would entail urinary diversion and treatment of any associated urinary tract infection. Blind transurethral bougienage of the urethra with an indwelling catheter must be avoided in patients with urinary retention or substantial quantities of leftover urine, since tissue damage will worsen the urethra's state. A suprapubic bladder fistula should be administered to these individuals [5]. Any existing urinary tract infection should be treated based on the findings of the test. After the acute crisis has been addressed, the stricture must be treated definitively. and open surgical techniques are the two primary options [6].

The majority of urethral stricture patients are treated by optical internal urethrotomy, which involves slitting the stricture under direct vision with a soft movable scalpel. In fact, this surgery is used as the primary therapy for both new and recurring strictures. Optical urethrotomy often results in a 20 % to 30 % recovery rate [7].

Our goal was to better understand the role of optical urethrotomy in the management of urethral stricture, as well as to elucidate post-procedure problems and their relationship to sample factors.

2. MATERIALS AND METHODS

Between August 2020 and May 2021, this study was conducted at Cairo's National Institute of Urology and Nephrology. The study comprised 18 male patients with urethral stricture who were between the ages of 22 and 51 years old. Patients with neurological deficits, diabetes, bladder stones, enlarged prostates, and metal stenosis were excluded from the study.

Clinically, all patients were assessed using a medical history, physical examination, and laboratory tests such as urinalysis, urine culture & sensitivity, blood urea, serum creatinine levels, blood sugar, and complete blood picture, as well as abdominal and pelvic ultrasonography. Uroflowmetry and a retrograde urethrogram were used to diagnose the urethral stricture. However, urethroscopy was used to make the definitive diagnosis.

The surgery was carried out under either general or spinal anaesthesia. Patients were flag draped appropriately and put in a dorsal lithotomy posture. The urethra was helped by a guide wire to function as a guide for correct incision of the stricture, which was done at 12 o'clock positions cutting the fibrous tissue until the urethroscope could pass easily into the urine bladder.

Irrigation with 0.9 % normal saline was utilized. An indwelling 16 Fr silicon urethral catheter was placed and remained in place for 3 to 2 weeks, depending on the length and intricacy of the stricture. Prior to the surgery, a prophylactic antibiotic was administered, and it was maintained for a few days after the catheter was removed. All patients were directed to attend the department once per 3 months for a year for subjective and clinical evaluation.

Good (continuous strong urinary stream, maximum flow rate > 23 ml/s without proof of narrowing at the site of stricture on retrograde urethrogram), fair (diminished, intermittent urinary stream, maximum flow rate > 17 ml/s and irregular reduced diameter at the stricture level), and poor (weak urinary stream, maximum flow rate > 12 ml/s with decisive narrowing at the stricture site) were the outcomes.

a. Statistical analysis

Univariate statistical analysis was used, P-values of equal or less than 0.05 were considered significant.

3. RESULTS

This was a cross-sectional study that included 18 male patients with urethral strictures, the majority of them (44.44%) were between the ages of 45 and 51. According to complains, Poor urinary flow was the most common complaint, with 6 (33.3%) patients reporting it, followed by urinary tract infection in 4 (22.2%) cases. Regarding the site of strictures, out of 18 patients, 3 (16.6 %) had prostatic membrane, 6 (33.3 %) had penile stricture, and 9 (50.0 %) had bulbar stricture as shown in **Table (1)**.

Table (1): Age, complains, and site of strictures distribution between patients

Parameters	No of patients (%)	Total (%)
Age (years) (%)		
- < 25	2 (11.11%)	18 (100%)
- 25-30	4 (22.22%)	
- 31-45	4 (22.22%)	
- 45 -51	8 (44.44%)	
Complains (n, %)		
- Poor urination	6 (33.3%)	18 (100%)
- Retention of urine	2 (11.11%)	
- Intermittency	3 (16.6%)	
- Incomplete emptying	3 (16.6%)	
- UTI recurrence	4 (22.2%)	
Site of stricture		
- Prostatic membrane	3 (16.6%)	18 (100%)
- Penile	6 (33.3%)	
- Bulbar	9 (50.0%)	

In terms of the etiological variables of our patients' urethral strictures, as shown in **Table (2)**. 44.4 % of our 18 patients had a history of trauma, whereas 27.7% of our patients had an iatrogenic etiology. Inflammatory causes account for 22.2 %, whereas idiopathic causes account for 5.6 %.

Table (2): Etiological variables of strictures among the patients.

Etiology	No of patients (%)	Total (%)
- traumatic	8 (44.4%)	18 (100%)
- Iatrogenic	5 (27.7%)	
- Inflammatory	4 (22.2%)	
- idiopathic	1 (5.6%)	

Extravasation of irrigation fluid into perispongiosal tissues occurred in 1 (5.6%) of the patients which was handled conservatively and did not necessitate surgical intervention. Urethral hemorrhage occurred in 2 (11.1%) of the patients with no one requiring a blood transfusion. one patients (5.6%) of the patients developed perineal hematoma. Recurrent stricture was recorded in 3 (16.6%) patients. Two of them (11.1%) were treated by re optical urethrotomy, while 1 (5.6%), required urethroplasty as sown in **Table (3)**. Regarding the overall outcome of optical urethrotomy rate was good in 12 (66.7%) patients, fair in 4 (22.2%) and poor in 2 (11.1%) cases as shown in **Table (4)**.

Table (3): distribution of patients regarding the Post-operation obstacles.

Post-operation obstacles	No of patients (%)	Total (%)
- Extravasation of irrigation fluid into perispongiosal tissues	1 (5.6%)	7 (38.9%)
- Urethral hemorrhage	2 (11.1%)	
- Perineal hematoma	1 (5.6%)	
- Recurrent stricture	3 (16.6%)	

Table (4): Overall outcome of optical urethrotomy

Post-operation obstacles	No of patients (%)	Total (%)
- Good	12 (66.7%)	18 (100%)
- Fair	4 (22.2%)	
- Poor	2 (11.1%)	

When compared to patients with urethral strictures elsewhere, people with penile strictures were decreased in complication after an ocular urethrotomy. Patients who had a good outcome after the surgery were less likely to have a problem. Accordingly, all parameters of patients were less likely to have a complication except those having incomplete emptying and recurrent urinary tract infection with (57.1%) as shown in **Table (5)**.

Table (5): The distribution of the analyzed sample as a result of developing problems during optical urethrotomy based on the sample's characteristics.

Parameters	NO complication	With complication	P-value
Age			
- <35	4 (66.7%)	2 (33.3%)	0.325
- >35	6 (54.5%)	5 (45.5%)	
Complains			
- Poor urination, Retention of urine, Intermittency	7 (63.6%)	4 (36.4%)	0.048
- Incomplete emptying, UTI recurrence	3 (42.9%)	4 (57.1%)	
Site of stricture			
- Penile	4 (66.7%)	2 (33.3%)	0.039
- others	8 (66.7%)	4 (33.3%)	
Etiological variables			
- traumatic	5 (62.5%)	3 (37.5%)	0.029
- Iatrogenic	3 (60.0%)	2 (40.0%)	
- Inflammatory	3 (60.0 %)	1 (40.0%)	
- idiopathic	1 (100.0%)	0 (0.0 %)	
Outcome			
- Good	9 (75.0%)	3 (25.0%)	0.001
- Not	4 (66.7%)	2 (33.3%)	

Data is expressed by (n, %); P-value is significant at 0.05, abbreviation: UTI: urinary tract infection

4. DISCUSSION

The ancient Egyptians were aware of the Urethral Stricture, which is still discussed today in urological practice [8]. The Urethral Stricture leads to the production of fibrotic scar tissue, which narrows the urethra and causes substantial voiding difficulties [9]. Voiding disorder might be asymptomatic or yield clinically important results [9]. On the other hand, because of its simplicity and ease of use, internal optical urethrotomy is now considered the standard method for treating urethral stricture. This operation has gained widespread acceptance for treating urethral stricture [10].

The most common etiology of urethral strictures is iatrogenic causes [11]. However, in our study, the etiology of urethral stricture was traumatic in 44.4% of the patients. This is in agreement with the study of Heyns et al. [12] who revealed that 59.2% for trauma and 27.2% for iatrogenic injuries. Chelton et al., [13] on the other hand, reported a trauma rate of 11.5 percent. Road traffic accidents traumas contributed to the increased prevalence of traumatic stricture in our study.

Our study revealed that the patients' ages ranged from 22 to 51 years in our study, which was similar to the study held by Mathur et al. [14]. Poor urine flow was the most prevalent complaint, with 6 (33.3%) patients reporting it, followed by urinary tract infection, which was



reported by 4 (22.2%) patients. This complains in agreements with several studies and systematic review [8], [15], [16].

Our study revealed that the overall outcome of optical urethrotomy rate was good in 12 (66.7%) patients, fair in 4 (22.2%) and poor in 2 (11.1%) cases. These were quite comparable with Holm-Nielsen et al. [17] conveyed success rate 77% and Pansadoro [18] reported 11% poor results.

In our results, extravasation of irrigation fluid into perispongiosal tissues was seen in one (5.6%) of the patients, although it was treated conservatively and did not need surgery. In 2 (11.1%) of the patients, urethral bleeding occurred, although no one required a blood transfusion. Perineal hematoma occurred in one patient (5.6%) of the subjects. Three patients (16.6 percent) had recurrent stricture. Re optical urethrotomy was used to treat two of them (11.1%), whereas urethroplasty was necessary for one of them (5.6%). This is in agreement when compared to previous work by Younas [19], although it was greater than the 4.4 % reported according to the outcomes of complications.

The study's limitations were a small sample size, a lack of a reference group, and sampling from only one Egyptian center.

In conclusion, internal urethrotomy is only effective in brief, first-time strictures, according to the core premise of urethral stricture therapy. To avoid extending the defect by repeated urethrotomy, therapy for a recurring stricture should be switched to open reconstruction. Open reconstructive surgery should only be performed by facilities with sufficient expertise, since this is the only method to get the greatest outcomes.

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