

A RETROSPECTIVE ANALYSIS OF THE ETIOLOGY AND TREATMENT OF URETHRAL STRICTURES

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Abstract: Urethral stricture refers to a narrowing of the urethra, caused by several factors. It has been a dilemma due to the high incidence of recurrence and the poor outcomes. The purpose of the study was to evaluate the etiology of symptomatic urethral strictures and the treatment applied in a large series of patients presenting for urologic treatment. During the year 2015 a total of 120 patients who underwent treatment for urethral stricture were included in our study.: This study included 120 patients with a mean age of 69,21 years. Etiologically, the most common reason were urological endoscopic surgical procedures (75%) and the most common used treatment was optical internal urethrotomy with urinary catheter, associated in case of patients with additional pathologies with other surgical procedures (TUR-p, TUR-v, bladder neck resection or cystolitholapaxy). 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.

Key words: urethral strictures, internal optical urethrotomy, Transurethral Resection of the Prostate, Transurethral resection of the bladder tumor.

1. Introduction

Urethral stricture refers to a narrowing of the urethra, caused by several factors. It has been a dilemma due to the high incidence of recurrence and the poor outcomes. The main effect of urethral stricture is the obstruction of the lower urinary tract, the consequence of this obstruction has an impact on the patient quality of life causing micturition

disturbances and even damage on the entire urinary tract that can result in loss of renal function [7].

The incidence of male urethral stricture remains unknown, especially because of the differences based on mean country income, population and geography. The number of urethral strictures increases after 55 years old in the male population, and remains a common and also challenging disease [13].

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The main causes of urethral strictures are congenital anomalies of the mucosal membrane, urethral instrumentation, catheterization, infection, hypospadias failures, traumatic scarring after pelviperineal trauma and inflammatory disease of the corpus spongiosum caused by lichen sclerosus. Idiopathic and iatrogenic etiology are the main causes of urethral strictures in developed countries while trauma remains the most common etiology of urethral strictures in developing and Third World countries.

Urethral manipulation (traumatic catheterization, correction of hypospadias, prostatectomy or transurethral interventions) are considered as iatrogenic and represents the frequent etiology of urethral strictures [4]. A study from 2011 of *Tasci et al* found that the incidence of urethral stricture after the most common intervention for prostate - TUR-p (Transurethral Resection of the Prostate) was up to 5% [14], [16].

Pelvic fracture associated with traumatic urethral rupture is another cause of this disease. Untreated gonorrhea can also lead to this pathology (with an incidence of approximately 20%).

A study on 78 patients of *Park et al* pointed out that 30% of urethral strictures are idiopathic, the most likely triggers being considerate some minor traumas that occurred in the past [11].

2. Objectives

The purpose of the study was to evaluate the etiology of symptomatic urethral strictures and the treatment applied in a large series of patients presenting for urologic treatment at the Emergency County Clinical Hospital of Brasov - Urology Clinic.

3. Material and Method

From January 2015 to December 2015 a total of 120 patients who underwent treatment in the Emergency County Clinical Hospital of Brasov -Urology Clinic for urethral stricture were included in our study.

Preoperative evaluation included a thorough clinical history, physical examination, urine culture, residual urine estimation, uroflowmetry, and retrograde and voiding cystourethrography. Ultrasound was performed to all patients.

4. Results

In our study the age range was from 35 to 87 years, with a mean age of the patients included in the study of 69,21 years with an increase of the disease in the interval of 63 and 66 years old (23 patients).

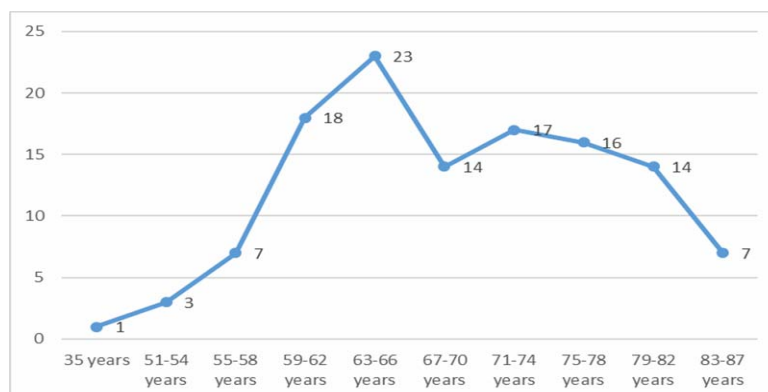


Fig.1. *Distribution of patients by age*

We found various etiological factors involved in the occurrence of urethral stricture, as showed in Table 2. In case of 90 patients (75%) instrumentation was responsible for urethral strictures (40

after TURP and 50 after TURBT (*Transurethral resection of the bladder tumor*), 20 % of cases were after trauma or catheterization and 5% were found to be caused by infection.

Various etiological factors

Table 1

<i>Etiology</i>		Number of cases	Percent of cases
<i>Postprocedural</i>	TURP	90	75%
	TURBT	40	45%
		50	55%
<i>Trauma/post catheterization</i>		24	20%
<i>Infection</i>		6	5%

In our study 99,17% of patients were male, only 0,83% female (1 patient), case in wich the diagnosis was external meatal

stenosis and it was performed dilatations of the urethra.

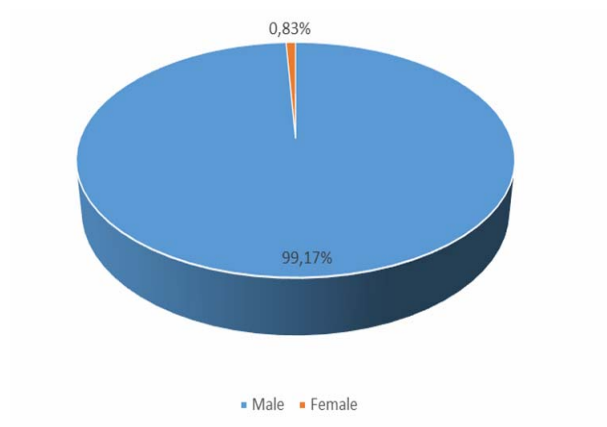


Fig.2. Distribution of patients by gender

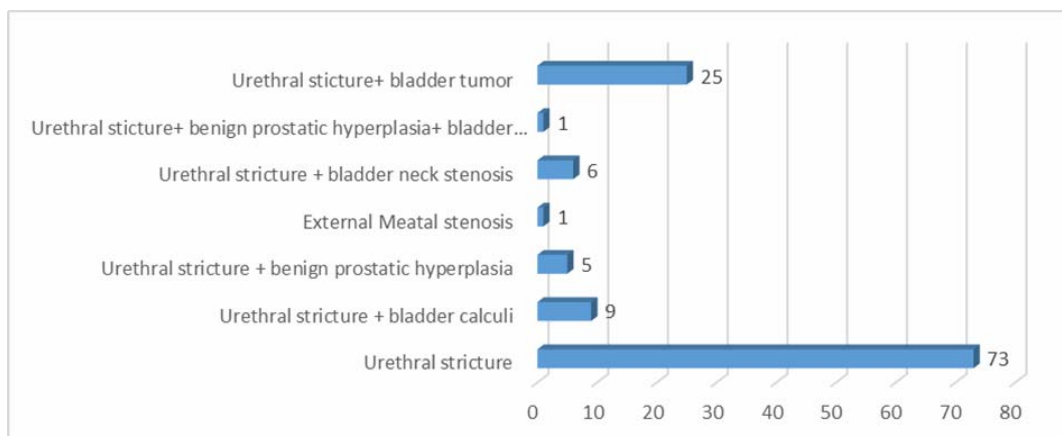


Fig.3. Distribution of patients according to their diagnosis

Of the total cases, 73 of patients (60,83%) were admitted with the following symptoms: difficult micturition, thin and threadlike urinary stream, postmictional bladder residue the diagnosis being of urethral stricture.

After rigorously investigations, in case of 9 of the total patients there was found in

addition to urethral stricture also bladder calculi, 25 with bladder tumors and 6 with bladder neck stricture. 1 (0,83%) patient was discovered with urethral stricture, bladder tumors and benign hyperplasia of prostate.

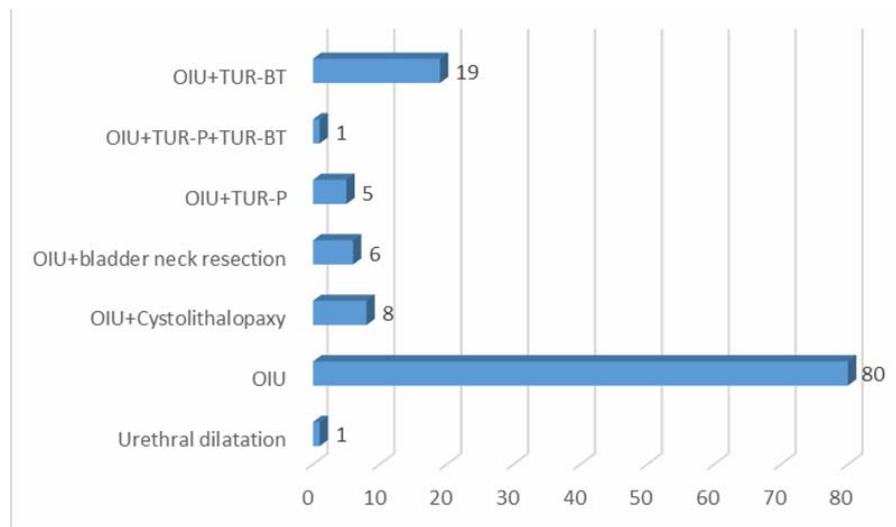


Fig. 4. *Distribution of patients according to the treatment*

Regarding the treatment performed, in 66,67% of cases (80 patients) it was performed only optical internal urethrotomy, while in the case of patients with secondary diagnosis (bladder tumors, bladder calculi, benign hypertrophy of prostate) there were added complementary treatments (TUR-v, TUR-p, bladder neck resection or cystolitholapaxy).

5. Discussions

Urethral stricture is a very challenging to the treating urologists, being a troublesome disease of human male. Major causes of stricture in this study were trauma, previous catheterization, infections and iatrogenic causes [7].

Several studies have been done to identify the major etiologies for stricture

formation, notwithstanding their actual impact on the long term outcome post-surgical intervention.

A first review of 20 articles regarding the etiology of strictures, was published in 1981, the most common cause at that time being urethritis in approximately 40% of the cases [2]. Other major series in the developed world, also report a 32% to 79% rate of iatrogenic causes [1,5] In 2002, a study conducted by Jordan et al pointed out that in the recent era, most strictures are a result of external trauma [6], [11]. Our study also observed such transition to the etiology of strictures, with 75% incidence of urethral strictures occurring post procedural (45% after TUR-p and 55% after TUR-v).

Characteristics of urethral strictures

Table 2

Study	Number of patients	Mean age	Etiology (%)		
			Trauma	Iatrogenic	Idiopathic
Stein et al [15]	2589	45.1	36.1	16.6	23.6
Fenton et al [5]	175	NR	9.6	31.9	31.9
Palminteri et al[10]	1439	42.7	10.8	38.6	35.8
Mathur [9]	302	NR	54	26.7	3.9

Venn et al concluded in their study that gonorrheal infection, infections by chlamydia and ureaplasma urealyticum or lichen sclerosus are the main cause of the inflammatory urethral strictures [17].

DePasquale et al found 15,2 % of cases from their study with post infective strictures, the most common isolate germ from urine cultures being Escherichia Coli suggesting that urethral obstruction may induce organisms which are cleared rapidly from the normal urinary tract, to cause bacteriuria, bacteremia and even pyelonephritis [3].

Urethral strictures are also caused by iatrogenic urethral injuries (urethral instrumentation or catheterization). The main cause for this pathology are considered the transurethral surgery and also prolonged catheterization. Several studies [1], [5], [7] found a rate of 32% to 79% of iatrogenic causes in their study of 375 patients conducted in 2008. We recorded in our study an incidence of iatrogenic urethral strictures of 75%.

Several studies from 2006 and 2009 reported that urethral stricture is considered a major late complication of TUR (9.8% of cases), as well as, radical (8.4%) and simple (1.9%) prostatectomy [8,12]. In our study it was observed that 45% of urethral strictures are after TUR-p and 55% after TUR-v. The exact mechanism of this complication, remains undetermined to date. Numerous causes of stricture formation post transurethral resection have been suggested (improper traumatic insertion of the resectoscope with perforation of the bulbous urethra and instrument friction at the penoscrotal

angle, eventually exacerbated by the narrow urethral caliber as well as monopolar current “leak „due to insufficient resectoscope isolation) [12]. In addition to this, patients undergoing this urological procedure are also catheterized in the post-operative period.

Prolonged catheterization is another cause of urethral stricture and leads to urethral ischemia and inflammation, and as a consequence the stricture formation [5].

Post instrumentation strictures are commonly located in the bulbomembranous urethra and usually short and well defined, correlating well with our findings.

Idiopathic strictures or strictures without any apparent reason have been observed in different studies. Although several theories have formulated, its mechanism remains unknown.

6. Conclusions

Urethral stricture disease is relatively common, and in many instances debilitating. The etiology of urethral stricture disease varies geographically. In general, the incidence of infection-related urethral stricture has decreased, especially in the developed world.

The basic principle in treatment of urethral stricture is that internal urethrotomy promises success only in short, first-time strictures. In a recurrent stricture, treatment should be changed to open reconstruction, in order to avoid lengthening the defect by repeated urethrotomy.

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.

It is important that open reconstructive surgery should be carried out at centers with adequate experience, as this is the only way to achieve the best results.

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