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Outcomes Of Endoscopic Urethrotomy and Urethroplasty On Uretheral Strictures

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ABSTRACT

Background: A small percentage of males get urethral stricture. As a first line of defence, urethrotomy is performed. A little over half of the strictures come back within four years. Repeat urethrotomy or open urethroplasty are two options for further therapy.

Objective: The purpose of this research is to find out how well endoscopic urethrotomy and urethroplasty work for treating uretheral strictures.

Methods: This retrospective analysis included 110 male patients underwent for uretheral stricture. Group I had 55 patients who got urethroplasty, whereas group II had 55 who received endoscopic urethrotomy. All patients in both groups were followed for 4-6 months. Both groups were compared for post-treatment success and complications. All data was analysed with SPSS 24.0.

Results: The mean age of the patients in group I was 47.18±6.53 years and in group II was 50.14±11.78 years.Most common symptoms were dysuria, urinary retention and pollakiuria among both groups. Infection was the most common cause followed by urethral trauma. Membranous urethra strictures were most prevalent. A substantial difference in Q max flowmetry was seen between the two techniques after surgery (p-value <0.05). Postoperative success rate was higher in group I compared to group II ($p < 0.004$). Group II 11 (20%) had a greater recurrence rate than group I 4 (7.3%).

Conclusion: In this study, we determined that urethroplasty is a safer and more effective procedure than endoscopic urethrotomy. Additionally, urethroplasty results in increased urine flow and an incidence of recurrence that is lower

Keywords: Urethroplasty, Endoscopic urethrotomy, Uretheral strictures, Recurrence, Success.

1. INTRODUCTION

A urethral stricture is a condition that occurs when the urethra becomes permanently and internally constricted, which results in a stoppage in the flow of urine. Injuries to the urethra and infections that are transferred sexually are the two situations that are described in the literature the most frequently. A number of different therapeutic methods are available for the treatment of male urethral stricture [1]. Treatments such as urethroplasty, bougienage, and endoscopic internal urethrotomy (EIU) fall within this category. The invasive procedure known as urethroplasty is done to treat urethral stricture. After undergoing this operation, a man runs the risk of developing penile abnormalities as well as sexual dysfunction issues. Because we do not have the necessary equipment, we do not make use of the bougienage technique in our environment. The recurrence rate of the EIU technique is extremely high when the extent of the stricture is more than one centimetre. On the other hand, when it comes to the treatment of urethral stricture, EIU is still the most accessible and practical solution for our circumstance [2]. Urethrotomy is the method of choice for recurrent bulbar stricture since it is minimally invasive, does not

need specific surgical skills, and requires just a short length of time for urethral catheterisation and rehabilitation. It is quite likely that it will occur once more [2]. Owing to the fact that it is more intrusive than other types of urethroplasty, open urethroplasty requires the utilisation of specific equipment, extends the amount of time that a patient must be catheterised, and delays the patient's return to their usual activities. Urethroplasty, on the other hand, has the potential to offer a permanent treatment that does not call for any more procedures in the future [3, 4]. The degree of invasiveness and the effectiveness of each surgery are two factors that need to be taken into consideration when men are deciding between these two options [5,6]. Consequently, when it comes to making decisions, local knowledge, expert suggestions, patient co-morbidities, and patient preferences are now the most important factors. However, after two years, data suggest that the recurrence rate ranges from fifty percent to one hundred percent (with a median of eighty percent) following the second (first repeat) urethrotomy [3]. It is required for a man to have repeated urethrotomies, with an average frequency of once every two years, throughout his whole life if he develops chronic stricture as a result of future recurrences [4]. The unfavourable outcomes that may occur following a urethrotomy include prolonged bleeding (which occurs in 6% of instances) and urinary tract infections (UTIs; which occur in 10% of cases). These complications can lead to a decrease in quality of life, unforeseen hospitalisations, and additional costs [5]. An alternative to endoscopic urethrotomy is the practice of reinstating the urinary system by the use of open surgical procedures. In order to get access to the urethra, a perineal incision, which is situated behind the scrotum, is utilised. A graft patch is often utilised once the constricted part has been located in order to permanently widen the lumen and restore the portion of the lumen that is affected by the illness [6]. There is a chance of a superior long-term cure rate, which is the primary advantage of having an open urethroplasty treatment performed. According to two systematic examinations of case series [7,8], the United Kingdom and the United States (US) have both reported a success rate of 90% freedom from stricture recurrence after two years. This success rate is based on the median success rate. Infection of the incision (five percent), dribbling after micturition (ten percent), and discomfort at the site of the oral graft donor (five percent) are the adverse effects that are reported the most frequently. According to the registry, endoscopic urethrotomy is still the operation of choice for guys who experience recurrent urethral strictures.[9-11] According to yearly hospital episode statistics from NHS England [12,13], there were a total of 818 urethroplasties performed in 2013–2014. Additionally, there were 9,663 endoscopic urethrotomies and urethral dilations conducted during that same time period. The research recruited male patients who had undergone one of two forms of urethral stricture surgery at our institution during the course of the previous five years so that they could participate

2. MATERIAL AND METHODS

This retrospective study was conducted at Institute of Kidney Diseases Hayatabad Peshawar from May 2023 to August 2024 and comprised of 110 patients. By collecting informed written consent, we were able to establish demographic baseline characteristics for the recruited patients, including age, BMI, and comorbidities. Those patients who were ineligible for a 3-hour duration of anaesthesia, had perineal infections or fistulas, or were unable to provide informed consent to randomisation were not included in this study. Sampling technique was non-consecutive.

The participants' ages ranged from eighteen to seventy. In the first group, 55 patients underwent urethroplasty surgery; in the second, 55 patients underwent endoscopic urethrotomy (EU). When assessing the characteristics of the stricture, we considered its origin, length, maximum urine flow before and after surgery, and functional outcomes using serial voiding urethrography six months after surgery.

For qualitative variables, we utilized percentages to show the results, whereas for continuous variables, we used averages and standard deviations. When comparing two sets of data, the chi-square test was first employed; if it failed to achieve the necessary degree of validity, the Fisher exact test was then utilized. Since the K contrast medium did not meet the requirements for parametric testing, the nonparametric Kruskal-Wallis and Mann-Whitney U tests were employed. The significance threshold that was utilized was $p < 0.05$. The data was analyzed using SPSS 24.0.

3. RESULTS

The mean age of the patients in group I was 47.18±6.53 years and in group II was 50.14±11.78 years. Most common symptoms were dysuria, urinary retention and pollakiuria among both groups. Comorbidities were diabetes, chronic pulmonary disease andcardiovascular disease. Smoking history was found in 12 cases of group I and 14 cases of group II.(table 1)

Table-1: Features of cases that were enrolled

Variables	**Urethroplasty (55)**	**Endoscopic urethrotomy (55)**
Mean age (years)	47.18±6.53	50.14±11.78
Symptoms		

dysuria	25 (45.5%)	23 (41.8%)
urinary retention	20 (36.4%)	17 (30.9%)
pollakiuria	10 (18.2%)	15 (27.3%)
Comorbidities		
diabetes	30 (54.5%)	28 (50.9%)
chronic pulmonary disease	12 (21.8%)	16 (29.1%)
cardiovascular disease	13 (23.6%)	11 (20%)
cardiovascular disease	12 (21.8%)	14 (25.55)

Infection was the most common cause followed by urethral trauma and iatrogenic lesions. Membranous urethra strictures were most prevalent site followed by bulbar urethra and penile urethra.(table 2)

Table-2: Causes and site of uretheral strictures among both groups

Variables	Group I (55)	Group II (55)
Causes		
infection	33 (60%)	30 (54.5%)
urethral trauma	15 (27.3%)	17 (30.9%)
iatrogenic lesions	7 (12.7%)	8 (14.5%)
Site of strictures		
membranous urethra	28 (50.9%)	29 (52.7%)
bulbar urethra	22 (40%)	16 (29.1%)
penile urethra	5 (9.1%)	10 (18.2%)

A substantial difference in Q max flowmetry was seen between the two techniques(group I14.5±3.37 Vs 7.6±10.44 mL/s group II) after surgery (p-value <0.05). (table 3)

Table-3: Results compared between the two groups before and after surgery

Variables	Urethroplasty (55)	Endoscopic urethrotomy (55)
Pre-operative		
Q max (mL/s)	4.12±6.17	5.8±7.49
Post- operative		
Q max (mL/s)	14.5±3.37	7.6±10.44

Postoperative success rate was higher in group I compared to group II ($p < 0.004$). Group II 11 (20%) had a greater recurrence rate than group I 4 (7.3%).(Table 4)

Table-4: Comparison of outcomes and recurrence

Variables	Urethroplasty (55)	Endoscopic urethrotomy (55)	P value
Outcomes			
Success	48 (87.3%)	31 (56.4%)	<0.004
Failure	7 (12.7%)	24 (43.6%)	
Recurrence			
Yes	4 (7.3%)	11 (20%)	
No	51 (92.7%)	44 (80%)	`<0.003

4. DISCUSSION

Clinicians and men with recurrent bulbar urethral stricture still don't know if urethrotomy or urethroplasty is better, and a recent updated Cochrane review didn't find any additional trials to support either option [14]. Healthcare practitioners are

thereby impeded in their ability to arrange suitable services. There must be proof of efficacy and cost-effectiveness, and the OPEN trial can still give that.There was no statistically significant difference in the primary patient reported outcome between trial arms, which was consistent with the main clinical outcome finding that indicated that the two trial arms of the OPEN trial were generally equally effective, as measured by QALYs [15]. Compared to the urethrotomy group, the costs associated with urethroplasty were greater. While urethroplasty does have a lower recurrence rate than urethrotomy, the higher cost and similar QALY gain make it unlikely to be cost-effective.

According to our research, urethroplasty should be thought of as an initial option for dealing with strictures that are more than 1.5 cm in length. We highly recommend urethroplasty if the stricture is more than 3 cm in length or if internal urethrotomy is not feasible. Unfortunately, therapy has failed for a few of our patients in the past. Although it would be more beneficial to compare results from strictures of varying lengths (those less than 1.5 cm and those greater than 3 cm), we are unable to do so due to limitations in patient numbers and stricture characteristics. Nevertheless, depending on the surgical risks and patient preferences, urethrotomy as a pretreatment may be a less invasive option than urethroplasty in the long run [16].

In current study 110 male patients were included. The mean age of the patients in group I was 47.18±6.53 years and in group II was 50.14±11.78 years. Most common symptoms were dysuria, urinary retention and pollakiuria among both groups. Comorbidities were diabetes, chronic pulmonary disease andcardiovascular disease. In comparison to the findings of past study, this inquiry came to similar conclusions. [17–19] and With urethral trauma and iatrogenic lesions coming in second and third, respectively, infections were the most prevalent causes. The strictures of the membraneous urethra were the most common location, followed by those of the bulbar urethra and the penile urethra of the patient. [20] Depending on the surgical risks and the desires of the patient, preparation with urethrotomy does not have any impact on the outcomes of urethroplasty. As a consequence, it may be a less invasive treatment option.[22]The long-term outcomes of urethrotomy, on the other hand, have been demonstrated to be much less favourable than those of urethroplasty. This is something that needs to stress. [22] After the surgical procedure, it was observed that there was a significant disparity in the Q max flowmetry between the two procedures (group I 14.5±3.37 mL/s against group II 7.6 ±10.44 mL/s—p-value <0.05).

These findings were in line with those of earlier research that found urethroplasty to be more effective than urethrotomy in terms of Q max flowmetry. [23,24]

Postoperative success rate was higher in group I compared to group II ($p < 0.004$). Group II 11 (20%) had a greater recurrence rate than group I 4 (7.3%). Previous studies conducted same results.[22-24] Even though there are a variety of endoscopic urethrotomy techniques that can be used with different kinds of materials, such as laser, cold cut, or electric cut, urethroplasty, which is the operation that is used to treat urethral stricture, allows for the introduction of novel methods and alterations that are not possible with urethrotomy. [25] An increase in the availability of inorganic matrices for surgical procedures and organic matrices packed with cells derived from a variety of sources for tissue engineering has been brought about by the development of urinary tract urethroplasty. [26]

5. CONCLUSION

In this study, we determined that urethroplasty is a safer and more effective procedure than endoscopic urethrotomy. Additionally, urethroplasty results in increased urine flow and an incidence of recurrence that is lower

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