OUTCOME OF OPTICAL INTERNAL URETHROTOMY AND ANASTOMOTIC URETRHOPLASTY FOR SHORT SEGMENT BULBAR URETHRAL STRICTURE

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Abstract

Background*: Urethral stricture diseases are common urological problems in our country. The etiologies include iatrogenic, trauma, infection, congenital and very few are idiopathic. Urethral strictures have the potential for great negative impact on patients. These have several treatment modalities, ranging from simple dilations to complex multistaged urethroplasties. Optical internal urethrotomy and anastomotic urethroplasty are the common procedures among them which are particular topics in this study.*

Objectives*: To evaluate the outcome of two surgical techniques- Optical Internal Urethrotomy (OIU) and Anastomotic Urethroplasty.*

Methodology*: A total of 50 patients with short segment bulbar urethral strictures were consecutively included in the study. Purposive sampling method was applied. The present outcome clinical study was conducted in the department of Urology, National Institute of Kidney Diseases and Urology, Sher-E-Bangla Nagar, Dhaka, Bangladesh over a period of 1 year from February 2016 to January 2017. Student's t-test and chi-square test were applied for hypothesis testing. 'P' value <0.05 was considered as significant.*

Result*: There is no significant difference between two groups regarding age, history of previous operation for stricture urethra, mode of clinical presentations before intervention, immediate post-operative complication and uroflowmetry during follow-up. But length of stricture of two groups, urinary stream at 3 and 6 months after operation, urinary tract infection at 6 month after operation, recurrence of stricture in two groups were statistically significant (p<0.05).*

Conclusion*: The study concluded that anastomotic urethroplasty was an effective and satisfactory technique for the treatment of short segment bulbar urethral stricture. The morbidity and complications were low and outcomes were excellent.*

Kea words*: Stricture urethra, anastomotic urethroplasty, OIU.*

Bangladesh J. Urol. 2019; 22(1): 30-35

Introduction

Urethral stricture is the narrowing of the caliber of the urethra caused by the presence of a scar mostly consequence of infection or injury. It is one of the common urological problems. The term urethral stricture refers to anterior urethral disease or a scarring process involving the spongy erectile tissue of the corpus spongiosum. The spongy erectile tissue of the corpus spongiosum underlies the urethral epithelium and in some cases the scarring process extend through the tissue of the corpus spongiosum and into adjacent tissue. Contraction of this scar reduces the urethral lumen[7].

Stricture disease can have profound impact on quality of life. It may lead to urinary tract infection, bladder calculi, urethrocutaneous fistula, sepsis and renal failure. Urethral stricture is one of the most important

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Received: 05 August 2018 **Accepted:** 15 November 2018

causes of bladder outflow obstruction which may be resulted from varieties of pathology e.g. inflammatory disease, injuries of urethra, neoplasm of urethra, congenital stricture etc[15]. The diagnosis of bulbar urethral stricture and estimation of stricture severity can be established on the basis of physical examination, retrograde urethrogram, cystourethroscopy and most recently sonourethrography[23].

A multitude of treatment modalities have evolved aiming to cure these patients but none has proven to be suitable for all types of strictures[1]. To devise an appropriate treatment plan, it is important to determine the location, length, depth, and density of the stricture[25]. Surgical treatment of the urethral strictures includes numerous options such as dilatation, OIU, stent and reconstructive surgical techniques[6]. A variety of closed and open techniques now exist for treatment of urethral stricture diseases, perhaps underscoring the inability of any one form of treatment to be applicable uniformly[25]. Peterson and Webster (2004) suggested that no one technique was appropriate for all stricture diseases and the urologist must be familiar with the various surgical techniques to deal with any condition of the urethra during surgery.

Optical Internal urethrotomy (OIU) which is also termed as Direct Visual Internal Urethrotomy (DVIU), refers any procedure that opens the stricture by incising or ablating it transurethrally[9]. The urethrotomy procedure involves incising scar tissue to allow the stricture segment to expand (release of scar contracture) and the lumen to heal enlarged. OIU continue to be the most commonly used techniques and the goal is for the resultant larger luminal caliber to be maintained after healing[10]. Urethroplasty is an open surgical procedure for urethral reconstruction. It can be performed by two methods; primary repair which involves complete excision of the narrowed part of urethra. The proximal and distal patent parts are then rejoined. It is termed as Excision and Primary Anastomosis (EPA). The second method of urethroplasty utilizes tissue transfer or free graft technique. Short strictures especially of the bulbar urethra, are successfully managed with simple excision and anastomotic urethroplasty[16].

Therefore, I have attempted the task of two types of stricture treatment by prospective study selecting a group of patients with bulbar urethral stricture.

Methods:

Total 50 patients with short segment bulbar urethral strictures were consecutively included in the study and was conducted in the department of Urology, National Institute of Kidney Diseases and Urology, Sher-E-Bangla Nagar, Dhaka, Bangladesh over a period of 1 year from February 2016 to January 2017. Purposive sampling method was applied as per inclusion and exclusion criteria. The cases were numbered chronologically and odd number grouped as Group A for OIU and even number as Group B for anastomotic urethroplasty. This was a quasi-experimental study. The patients with bulbar urethral stricture of size <2 cm, age ranging from 11 to 50 years and no other co-existing diseases e.g. ESRD, BXO, active infection, immune-compromise, malignant stricture urethra or history of PUDD, were admitted for anastomotic urethroplasty & OIU fulfilling the selection criteria. The etiology of the stricture was recorded. The age of the patients, site and length of the stricture were noted.

Preoperatively, both retrograde urethrography, micturating cystourethrogrphy and ultrasonography was used to evaluate the location, length and density of the stricture. Patients with documented urinary tract infection (UTI) were treated with appropriate antibiotics before the procedure & confirmed by repeat culture sensitivity (C/S). The surgical procedure was performed with the patients under spinal anesthesia. A structured collection form was developed (research instrument) containing all the variables of interest. Data were collected and recorded in data collection sheet. Variables were assessed systematically. After meticulous checking and rechecking, data were compiled and statistical analysis were done using computer, based on statistical software (SPSS-Statistical Package for Social Science, version-16). Student's t-test and chi-square test were applied for hypothesis testing. 'P' value <0.05 was considered as significant.

Result:

The mean age was almost identical between optical internal urethrotomy and anastomotic urethroplasty groups (33.6 ± 9.1 year and 33.9 ± 10.4 years; p=0.931). Inflammatory stricture was predominant in both OIU (52%) and anastomotic urethroplasty (60%) group. Three (12%) and six (24%) of 25 patients in OIU group had history of previous dilatation and optical internal urethrotomy for urethral stricture, compared to 28% dilatation and 12% OIU in anastomotic group

respectively. No significant difference was observed between groups in terms of operative technique (p= 0.268). Clinical presentation shows that all the patients of both groups had a history of poor urinary stream. 76% LUTS and 4% acute urinary retention in OIU and anastomotic urethroplasty group respectively. No significant difference was found between groups with respect to clinical presentation (p> 0.005). 24% of patients in OIU group experienced bleeding, 4% epididymitis and another 4% incontinence. In contrast, 8% of patients in anastomotic urethroplasty group complained of periurethral leakage, 8% fever and another 8% wound infection. Apart from bleeding, all the complications are almost homogeneously distributed between two groups which was nonsignificant (p> 0.05). Six (24%) of patients in OIU group exhibited narrow urinary stream at month 3, as opposed to none in anastomotic urethroplasty group(p=0.001). 28% of patient in OIU group had narrow urinary stream at month 6 compared 4% in anastomotic urethroplasty group. Here, Q-max in uroflowmetry less than 10 ml/sec was considered as 'narrow' urinary stream. The difference was statistically significant in terms of urinary stream (p= 0.024). Of the 25 patients of OIU group, 1(4%) developed UTI at 3 month and 5 (20%) at 6 month. None of patient in anastomotic urethroplasty group developed UTI. There was significant difference between two groups in terms of UTI at 6 month (p=0.025). The mean length of stricture was 1.5 ± 0.3 cm and 1.8 ± 0.2 cm in both OIU and anastomotic urethroplasty group respectively. The recurrence rate of stricture in OIU was 24% (6 out of 25 patients) at month 3. However, none in anastomotic urethroplasty group had history of recurrence of stricture in same duration (p =0.011). Seven (28%) patients in OIU needed second urethrotomy, whereas only 1 (4%) required anastomotic urethroplasty at month 6 (p=0.024). The mean uroflowmetry at baseline was 5.5 ml/sec in both groups which steeply increased in both OIU and anastomotic urethroplasty groups reaching a mean uroflowmetry of 25.3±2.6 ml/sec and 23.9± 2.2 ml/sec respectively and then dropped to 18.4±6.3ml/sec and 20.2± 2.6 ml/sec in OIU and anastomotic urethroplasty groups respectively at 3 month and to 17.8±6.4 ml/sec and 19.6±2.6 ml/sec respectively at 6 month which were clinically significant.

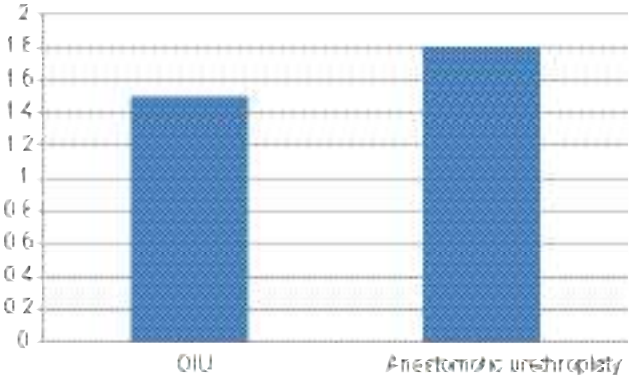

Fig.-1:

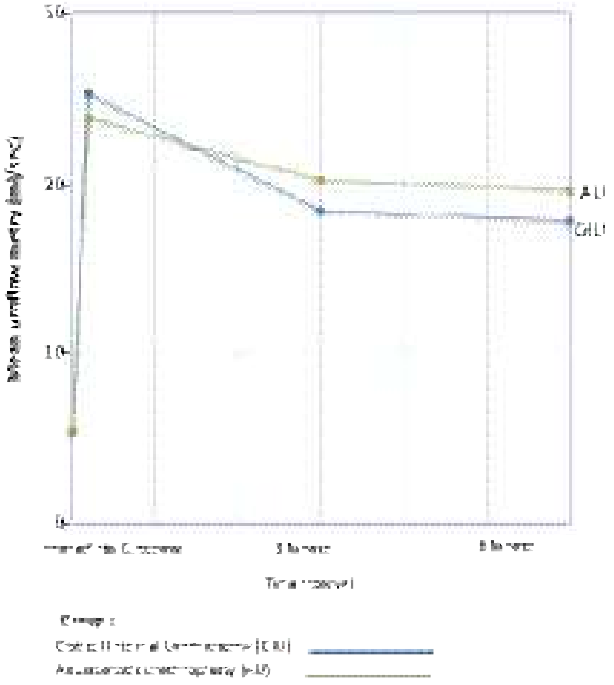

Fig.-2: *Uroflowmetry at different time interval (n=50)*

Discussion

This study was designed to evaluate the outcome of optical internal urethrotomy (OIU) and anastomotic urethropasty in the treatment of short segment bulbar urethral stricture. Andrich et al. (2003) stated that the result of anastomotic urethroplasty was good and sustained in the long term, while the result of OIU deteriorated steadily with time. An anastomotic repair should be performed in presence to an optical internal urethrotomy when possible. Primary end-to-end anastomosis was the gold standard reconstructive technique for short segment bulbar stricture urethra

(<2 cm), with free graft and pedicle flaps best reserved for longer strictures[3]. Eltahawy et al. (2007) found new onset ED to be negligible following anterior anastomotic urethroplasty (2.3%)[11]. Similarly, Santucci, Mario and McAninch (2002) reported that new onset of ED occurred in less than 1% of 168 men having bulbar urethroplasty via primary anastomosis. Others had reported a range of 5% -26% of men with anastomotic reconstruction for anterior strictures complaining of ED. These figures taken together, justified the continued aggressive use of primary anastomosis for short segment urethral stricture[22].

All the patients of the present study were within 11-50 years of age range. The mean age of the subjects in both OIU and anastomotic urethroplasty groups were identically distributed (33.6± 9.1 years and 33.9 ±10.4 years respectively). The mean length of stricture was 1.5±0.3 cm and 1.8±0.2 cm in OIU and anastomotic urethroplasty group respectively. Kane et al. (2002) demonstrated mean age were 32 years (range 17 to 64) and the mean length of stricture were 3.6±1.8 cm[16].

In OIU group, inflammatory stricture was found in 52% of cases, traumatic stricture in 20%, iatrogenic in 12% and idiopathic in 16% of cases; while in anastomotic urethroplasty group inflammatory stricture was in 60%, traumatic in 16%, iatrogenic in16% and idiopathic in 8% of cases. No significant difference was observed between groups in terms of causes of stricture. Albers and his associates (1996) reported stricture due to iatrogenic (so-called post transurethral resection), inflammatory (particularly from long-term use of transurethral catheters) and traumatic strictures, and those without a known cause (so called idiopathic) were the main types of urethral strictures in men. The idiopathic strictures were found in 51% of patients[1].

Immediate outcome of intervention shows that 24% of patients in OIU group encountered bleeding, 4% developed epididymitis and another 4% incontinence of urine. In contrast, 8% of patients in anastomotic urethroplasty group had periurethral leakage, 8% fever and another 8% wound infection. All the complications except bleeding were almost identically distributed between groups. Johnston et al., 1980 reported that complications were minimal: blood transfusion was never needed, infections were all of short duration. Among 67 of OIU patients, UTI in 4 cases, epididymitis in 1 case, bleeding in 6 cases and only one patient who had a significant pyrexia and rigors.

Forty-seven of the OIU procedure were done under topical anesthesia. Urethral bleeding requiring repeat endoscopic examination and fulguration was the only complication and occurred in a patient who was incised at the 6 o'clock position[25].

The complication rate was <6 per-cent. No serious bleeding, epididymitis, priapism, impotence or fistula was observed. There was considerable extravasation of the irrigating fluid involving the penis and scrotum but this resolved spontaneously in all cases in 2 to 3 days with elevation of the scrotal sac 8. All immediate complications except bleeding were nearly identical between OIU and anastomotic urethroplasty group[23].

In my study at month 3, one-quarter (24%) of patients in OIU group exhibited narrow urinary stream, as opposed to none in anastomotic urethroplasty group. Narrow urinary stream at month 6 demonstrated its significant presence in OIU group (28%) compared to that in anastomotic urethroplasty group (4%). Here, Q-max in uroflowmetry less than 10 ml/sec was considered as 'narrow' urinary stream. It also represents the recurrence of stricture urethra. Albers et al. (1996) demonstrated in their study a recurrence rate of 44.8% after primary urethrotomy and 34.6% underwent a second OIU. Stricture recurrence occurred after upto 8 years after the initial operation. Because of the chronic nature of the urethral stricture, a follow-up time of at least 10 years is needed before the final results of urethrotomy can be evaluated 20. Strictures recurred in 8 patients among 168, including within a year in 6, and at 20 and 80 months in the remaining 2 (mean time to recurrence 15 months). Of the 8 recurrences, 5 were managed successfully by OIU, while repeat urethroplasty was required in 3[22].

In this study, the mean uroflowmetry at baseline was 5.5 ml/sec in both groups which steeply increased in both OIU and anastomotic urethroplasty groups reaching a mean uroflowmetry of 25.3±2.6 ml/sec and 23.9± 2.2 ml/sec respectively and then dropped to 18.4±6.3ml/sec and 20.2± 2.6 ml/sec in OIU and anastomotic urethroplasty groups respectively at 3 month and to 17.8±6.4 ml/sec and 19.6±2.6 ml/sec respectively at 6 month. Kane et al. (2002) reported in his study that average peak urinary flow rates increased from 7.9 ml/sec at baseline to 30.1ml/sec postoperatively in anastomotic group.

Conclusion

From the findings of the study and discussion thereof, it can be concluded that anastomotic urethroplasty is an effective and a satisfactory technique for the treatment of short segment bulbar urethral strictures. The morbidity and complications are low and outcomes are excellent.

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