

Research Article

Outcome of Internal Optical Urethrotomy in Combination with Corticosteroids Injection in Recurrent Anterior Urethral Strictures

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Abstract

Background: Urethral stricture is a common urological disease and can occur mostly as a result of recurrent infections, inflammation, trauma or unknown factors. Internal optical urethrotomy is a useful treatment modality for the management of urethral strictures. Several adjuvant interventions are suggested to decrease the recurrence rate of urethral strictures.

Objectives: To report the success rate of internal optical urethrotomy in combination with corticosteroids in recurrent anterior urethral strictures.

Materials and Methods: This prospective clinical randomized control trial was performed on 70 patients from 1st January 2017 to 31st Dec 2018. Patients fulfilling the inclusion criterion were randomly divided into two groups. The experimental group comprises 34 patients who received a corticosteroid injection in combination with internal optical urethrotomy while the control group consisting of 36 patients who received distilled water in combination with internal optical urethrotomy. All the patients were advised not to do clean intermittent self-catheterization (CISC) and were followed for 24 months.

Results: The mean follow-up time was 9 ± 5.40 months (6-24 months). Complications occurred in 14 patients. In the experimental group recurrence of stricture occurred in 11 patients, extravasation into perispongial space in 3 patients (8.82%), infection in 1 (2.94%) and bleeding in 2 (5.8%) patients. In the control group recurrence of stricture occurred in 16 patients, Infection occurred in 3 patients and extravasation and bleedings in 2 and 3 patients respectively. Moreover, the difference between the recurrence in the experimental and control groups is also not significant ($p.0.05$). However, the stricture-free duration that is the time of recurrence was significantly delayed in the experimental group (8.07 ± 5.51 versus 3.8 ± 1.53 months).

Conclusion: It is concluded that internal optical urethrotomy in combination with corticosteroid injection delays the recurrence rate of urethral stricture significantly. It can also be a feasible procedure for those who do not want urethroplasty or those with high risk for general anesthesia.

Keywords: Urethral stricture; Urethrotomy; Urethroplasty; Retrograde urethrography; Corticosteroids

Introduction

Urethral stricture is a common urological disease and results in high morbidity. It can occur mostly as a result of recurrent infections, inflammation, trauma or unknown factors. In the affected area of urothelium scar tissue forms that result in stricture formation. Stricture can occur anywhere along the length of the urethra [1]. Different treatment modalities have been developed to treat urethral strictures based on the position, depth and length of the scar. Internal optical urethrotomy is a useful treatment modality for the management of urethral strictures up to 1.5cm in length. However, recurrence with this treatment modality is high [2]. Steenkamp et al. did a comparative study between dilatation and internal optical urethrotomy and found no statistically significant difference between dilatation and internal optical urethrotomy [3]. Several

adjuvant interventions are suggested to decrease the recurrence rate of urethral strictures after internal optical urethrotomy [1]. Hebert suggested a local injection of corticosteroids (triamcinolone) after urethrotomy for the first time [4]. Corticosteroids reduce scarring by reducing the synthesis of collagen and glycosaminoglycans and the expression of inflammatory mediators [5]. Hebert's study was followed by Sachse and Gaches and colleagues, who reported favorable results when injecting corticosteroids [6,7], Abourachid and his team recommended intralesional steroid injection to reduce the rate of recurrence of urethral stricture [8]. In the intended study, we examined the results of the triamcinolone acetonide injection with the frequency of recurrence of the stricture after internal optical urethrotomy. In addition, we observe the interval between urethrotomy and recurrence of urethral stricture in the longitudinal direction.

Materials and Methods

This clinical trial was conducted at institute of Kidney Diseases Peshawar. A convenience sample of 70 outpatients patients were taken fulfilling the inclusion criterion which was divided randomly into two groups that is experimental and control group. Each group has 35 subjects. Experimental group received corticosteroid injection in combination with internal optical urethrotomy while the control group received distilled water in combination with internal optical urethrotomy. The length of stricture was 10mm to 20mm located in anterior urethra. All the patients presented with indwelling catheters, urinary tract infection, immunologic disease, neurogenic bladder and previous history of urethrotomy or dilatation were excluded from the study. Patients included in the study signed the written informed consent before commencement of surgery. Cystourethroscopy and pre-op urethrogram was used to evaluate length and location of stricture. A single surgeon performed the whole procedure and the patients were followed prospectively. Before conducting the study an ethical committee approval was taken from the Institute of Kidney Diseases Peshawar.

Surgical Technique

All the patients included in our study were pre-operatively evaluated such as history taking, physical examination and retrograde urethrography. The procedure was performed under spinal anesthesia. A single incision by urethrotome is given at 12 o'clock position at fibrous tissue of stricture endoscopically and the study solution (triamcinolone) was injected into all around the fibrous tissue. Intravenous antibiotics were given before the start of procedure. Every patient was catheterized (16FR) for 3 to 5 days and after the removal of catheter, all the patients were followed for 24 months. The patients were evaluated in follow-up visits with history taking, physical examination, lower urinary tract symptoms and retrograde urethrogram. Cystoscopy can also be performed if indicated.

Results

The mean follow-up time was 9±5.40 months (6-24 months). Among 70 patients, complications occurred in 14 patients. No complication occurred merely due to corticosteroids use. The mean time at which recurrence of stricture occurred was 6.41±4.90 months. In the experimental group recurrence of stricture occurred in 11 patients, extravasation into peri spongel space in 3 patients (8.82%), infection in 1(2.94%) and bleeding in 2(5.8%) patients. In the control group recurrence of stricture occurred in 16 patients, Infection occurred in 3 patients and extravasation and bleedings in 2 and 3 patients respectively. Though the complications rate occurred in the experimental group was less than the control group but the difference is not statistically significant. Moreover, the difference between the recurrence in the experimental and control groups is also not significant that is 32.3% in experimental and 44.4% in the control group. However, the stricture-free duration that is the time of recurrence was significantly delayed in the experimental group as compared to control group (8.07 ± 5.51 versus 3.8 ± 1.53 months) (Table 1 and 2).

Discussion

Urethral stricture is the narrowing of the urethral lumen due to

Table 1:

Complications	Experimental group	Control group
Extravasation into peri spongel space	3	2
Infection	1	3
Bleeding	2	3

Table 2:

S.no	Experimental Group	Control Group
Recurrence	11	16

ischaemic spongiofibrosis. The main challenge of currently available management options is recurrence of the stricture. The causative factors of stricture of urethra have changed over time. Trauma has taken over infection as the commonest cause. The management options of stricture also have changed over the times. In spite of different management options for the treatment of stricture urethra, internal urethrotomy has remained a popular option among the urologists due to its simple procedure technique, safety and shorter learning curve. Internal optical urethrotomy is nowadays considered as a treatment of choice for correction of the urethral strictures up to 1.5 cm; however, the main problem with this technique is a high recurrence rate [2]. Fibrous tissue formation is the final common pathway for many fibrotic diseases. Following on from this, intralesional injection of antifibrotic agents/drugs (e.g. mitomycin C, corticosteroids, etc.) after internal optical urethrotomy has been studied in the past [9]. Holm-Nielsen et al. reported a 50% to 75% recurrence rate during a 2-year follow-up period [10]. The overall recurrence rate in our study is 38.6% in the experimental group while 41.7% in the control group which is consistent with the results of Holm-Nielsen et al. The shorter duration of follow up in our study may be the reason for the low recurrence rate. Adjuvant therapies such as brachytherapy and injection of mitomycin C have been suggested to decrease the recurrence rate of urethral strictures after internal optical urethrotomy (IOU) [11,12].

Iridium-192 brachytherapy with an initial dose of 1000-1500 centigray was given which was followed by irradiations for three days. Among 17 patients, only six patients developed complications during the 20 months follow-up period [10]. Various alternative techniques have been designed for urethral stricture treatment over the years and there is no consensus on the most successful method yet. Due to advances in laser technology, laser urethrotomy is also widely used. Most common laser type used for urethral stricture treatment is Holmium:Yag laser [13]. The study conducted by Shin et al. used rhenium-188 mercaptoacetyl triglycerine (188Re-MAG3)-filled balloon dilation in five patients. Two patients developed stricture while three patients needed further interventional procedures during the 16 months follow-up period [12]. However, there is a dire need for research on the advantages of brachytherapy to treat urethral strictures. The use of captopril by shriazi et al. reported good results but the heterogeneity of patients makes the understanding of their outcomes troublesome [11]. Mitomycin C has been largely used due to its anti-collagen property to minimize the recurrence rate of stricture after internal optical urethrotomy. Urethral stricture recurred in only 10% of patients at 6 months follow-up duration [14]. Hardec and team used corticosteroid injections in combination with internal optical urethrotomy and the result was a decrease in recurrence rate

from 19.4% to 4.3% [15]. In a randomized control trial conducted by Hosseini and team, started CISC in two groups. In the experimental group, triamcinolone injection was used as a lubricant for CISC while in other group water-based jelly was used as a lubricant. Recurrence rate in the experimental group was 30% while the recurrence rate in the control group was 40% [16]. Our results were similar to this study; however, in our study, the difference between recurrence rates was not statistically significant. Taking into account not to advise CISC to the patients, the results of the intended study shows that internal optical urethrotomy along with the combination of intralesional triamcinolone injection delays the time of recurrence of urethral stricture significantly. In spite of the benefits of these, steroids comes on top due to its cost effectiveness, minimum side effects and also its widespread usage [17]. Research efforts have primarily focused on decreasing the recurrence of stricture after internal urethrotomy and constructing tissue-engineered urethral substitutes to improve clinical outcomes of urethroplasty surgeries [18]. Moreover, the recurrence rate is decreased in the experimental group as compared to the control group but not to the level of significance.

Conclusion

The adjuvant therapy of corticosteroids after internal optical urethrotomy is an effective treatment to delay the recurrence time of urethral stricture. This modality of treatment also decreases the recurrence rate but not up to the level of significance. Furthermore, it is a feasible procedure for those who do not want urethroplasty or those with high risk for general anesthesia.

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