

OPTICAL INTERNAL URETHROTOMY IN THE TREATMENT OF URETHRAL STRICTURE DISEASE

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ABSTRACT

Objectives To evaluate the efficacy of internal urethrotomy in the treatment of urethral stricture disease as a first line of treatment.

Patients and methods The study has been prospectively undertaken for forty five patients with urethral stricture disease who were treated with cold-knife internal urethrotomy followed by regular self calibration or hydrostatic urethral dilatation via starting micturations while applying pressure over distal urethra so leading to urethral distention.

Results The age of the patients ranged between 22-80 years.

The follow up period was from 6 months to 3 years. The success rate was 88%. The complication occurred in 6.6% of cases.

Conclusion Internal urethrotomy could be regarded as the first treatment of choice in patients with a single, short urethral stricture or post urethroplasty stricture.

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Key words: Urethral stricture, Internal urethrotomy, Hydrostatic urethral dilatation

Urethral strictures are fibrotic narrowing composed of dense collagen and fibroblasts. The narrowing restricts urine flow and cause dilation of the proximal urethra and prostatic ducts.¹

The male urethra can be divided into 2 parts; the posterior urethra, including the membranous and prostatic urethra and the anterior urethra. The anterior urethra includes the navicularis and penile and bulbar tracts and is surrounded by the corpus spongiosum soft tissue.²

Currently urethral stricture disease is relatively common, most strictures being acquired from injury or infection. Blunt perineal trauma causes injury to the bulbar urethra; pelvic fractures result in urethral distraction defects in the posterior urethra, but iatrogenic causes, including urological instrumentation and placing indwelling catheters, which result in strictures anywhere in the urethra, are the most common causes.³

Patients who have urethral strictures most often present with obstructive voiding symptoms or urinary tract infections, such as prostatitis or epididymitis.⁴

To devise an appropriate treatment plan, it is important to determine the location, length, depth, and density of the stricture. The length and location of the stricture can be determined with

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radiography, urethroscopy and ultrasonography and the depth and density of fibrosis as evidenced by ultrasound evaluation of the urethra.⁴

The traditional treatment for urethral stricture disease is urethral dilatation or urethrotomy. Both have an ancient history but currently urethrotomy tends to be associated with visual urethrotomy, which is of course a recent development; traditional urethrotomy was blind.⁵

The purpose of this study was to evaluate the clinical experience of a tertiary regional center by applying the internal urethrotomy in the treatment of urethral stricture disease in Duhok as a first line of treatment.

PATIENTS AND METHODS

Forty five male patients were identified prospectively with signs & symptoms of urethral stricture disease. All were evaluated and operated upon in Azadi

general teaching hospital by direct internal urethrotomy using a guide wire or ureteric catheter Fr 4 to introduce it through a stenosed area.

The incision has been done at 12 o'clock position via a cold knife (Figure 1). In cases of severe stricture fibrous tissue was resected.

The ages ranged from 22 to 80 years (mean age 46.9 years).

All operations were done under general anesthesia by one urologist. Following the operations, the urethral catheter Fr 16 was left inside for 72 hours. All patients were instructed to carry out daily urethral calibration with a Foley catheter Fr 16 for 4 weeks and then biweekly for 2 months. Two patients have refused to do self catheterization.

Retrograde urethrogram and voiding cystourethrogram were considered for patients with suprapubic catheters and retrograde urethrogram was done for all patients for definite diagnosis.



Figure 1: Photograph of urethral stricture using colling knife

RESULTS

Between January 2002 and December 2005, 45 patients with urethral stricture disease (Figure 2 and Figure 3) were treated by internal urethrotomy and regular urethral calibration, and the results were as follow:

The presenting symptoms are shown in table 1. The most common presentation was weak urinary stream (24), followed by suprapubic catheter (7) and dribbling of urine (7), retention of urine (5) and renal failure (2).

The etiology of the stricture in patients included in the study is shown in the table 2.

The site and number of stricture in these patients are shown in tables 3 and 4.

Figure 4 demonstrates urethral stricture after correction.

Following internal urethrotomy the median hospital stay was 42.9 hours.

The patients were followed up for a mean of 19.2 months (3-35) months.

The results of analysis after first internal urethrotomy were as follow: Good results 30, improved 10, poor results 5.

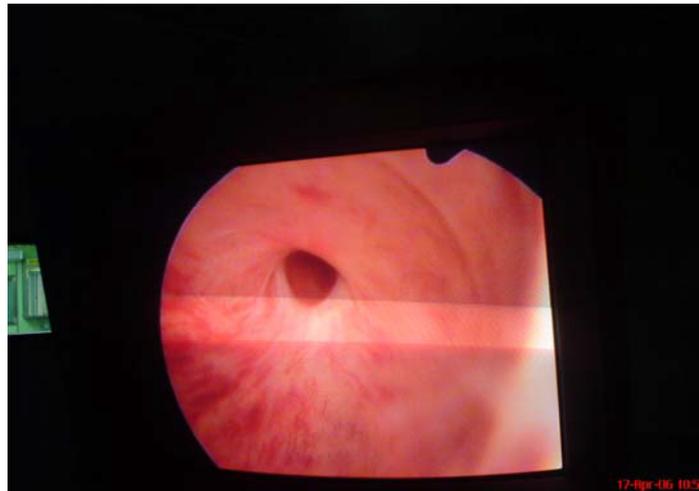


Figure 2. Photograph showing urethral stricture

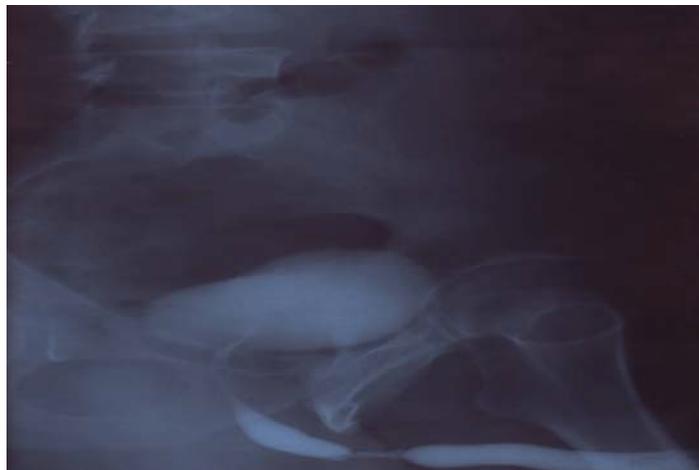


Figure 3. Retrograde urethrogram demonstrating bulbar urethral stricture

Good results

All patients have achieved normal voiding after single attempt of urethrotomy and over a period of follow up between (3- 35) months.

Improvement

The patients have improved, but they have needed another session of internal urethrotomy within 6 months period.

Poor results

The patients have required repeated admissions and repeated procedure within a short period of time (1-2 months).

All patients included in the study were potent and continent preoperatively and remained like that postoperatively except one patient who had preoperative erectile

dysfunction (a case of pelvic fracture distraction injury) and has remained impotent postoperatively.

All patients were received per and post-operative parental antibiotics.

Two patients have developed severe hematuria postoperatively which necessitate blood transfusion (2 units of blood for each).

Two patients had balanitis xerotica obliterans and have developed recurrences of stricture after a short period of internal urethrotomy, so Y-V meatoplasty were done for both of them with considerable improvement.

Four patients have developed fever and rigor and responded very well to parenteral antibiotics.

Table 1. Clinical presentation

Signs &symptoms	No. (%)
Weak stream	24 (53.3)
Dribbling	7 (15.5)
Retention	5 (11.1)
Suprapubic cystostomy	7 (15.5)
Renal failure	2 (4.4)
Total	45 (100.0)

Table 2. Etiology of urethral stricture

Etiology	No. (%)
Traumatic	12 (26.6)
Infection	11 (24.4)
Catheterization	8 (17.7)
Post-TURP	5 (11.1)
Post-urethroplasty	4 (8.8)
Others	5 (11.1)
Total	45 (100.0)

Table 3. Site of Urethral Stricture

Site	No. (%)
Bulbomembranous	24 (53.3)
Membranous	11 (24.4)
Penile	5 (11.1)
Prostatic	5 (11.1)
Total	45 (100.0)

Table 4. No. of Strictures

Type	No. (%)
Single	39 (96.6)
Multiple	6 (13.3)
Total	45 (100.0)

**Figure 4. Retrograde urethrograph of urethral stricture after correction**

DISCUSSION

Urethral stricture is one of the oldest known urological diseases and remains a common problem with a high morbidity despite earlier prediction to the contrary.⁶

Urethral dilatation has long been the standard treatment for patients with urethral stricture. However, in many patients such dilatation may be difficult, painful, or have to be done at frequent

intervals.⁷

Direct vision internal urethrotomy that was described by Sacher in 1974 is one of the most popular primary modalities of treatment.⁸

The technique of urethral dilatation was recorded in the sixth century BC in Hindu writings that described various surgical instruments, such as urethral dilators and catheters, to manage urethral obstruction.⁹

In this study we found a mean age of 46.9 years (range 22-80 years) which is similar to the finding of Meneghini et al.¹⁰

The most common presentations in our study were obstructive voiding symptoms & urinary retention. Andrew et al.³ also found that obstructive voiding symptoms remain the typical reason for evaluating urethral stricture disease.

The etiology of urethral stricture in the present study is traumatic in 26.6%, infection in 24.4%, catheterization in 17.7%, post-TURP in 11.1%, post urethroplasty in 8.8% and others in 11.1%. This is similar to report of Dobrowolski et al.¹¹ who documented that the most common cause of posterior urethral stricture is RTA (Trauma). While for anterior urethral stricture is iatrogenic (during catheterization or cystoscopy).

Thirty patients (66.6%) achieved good results after single attempt of internal urethrotomy, which is in concordance with other studies.^{12,13}

Among five patients who had poor results two of them had BXO who were treated first by internal urethrotomy and later on by Y-V meatoplasty which is the treatment of choice. Other three patients had multiple and long urethral strictures and refused to do self urethral calibration post operatively.

Frequent and regular post-internal urethrotomy self dilation of the urethra could reduce stricture recurrence rate at one year by as much as 46%.¹⁴

Patients who are poor candidates for initial or repeated internal urethrotomy include those with multiple, long (2-5 cm) penile or posterior strictures.¹⁴ All patients

were sexually potent pre operatively and remained like that except one of them who had pelvic fracture distraction injury and became impotent after injury. This patient, initially, underwent urethroplasty and internal urethrotomy later on but still is suffering from erectile dysfunction.

Many urologists suggested that incontinence and erectile dysfunction were purely traumatic rather than surgical.¹⁵

CONCLUSION

In keeping with reported literatures, internal urethrotomy could be regarded as the treatment of choice in patients with a single, short (<2cm) anterior urethral stricture or stricture following posterior urethroplasty if followed by regular self calibration for 3 months.

REFERENCES

1. Mc Aninch JW. Disorders of the penis and male urethra. In: Tanagho EA, Mc Aninch JW, editors. *Smith's General Urology*. 16th ed. USA: Appleton and Lange; 2003. p. 436-45.
2. Barbagli G, Palminteri E, Lazzeri M, Guazzoni G. Anterior urethral stricture. *BJU Int* 2003;92(5):497-505.
3. Peterson AC, Webster GD. Management of urethral stricture disease: developing options for surgical intervention. *BJU Int* 2004; 94(7):971-7.
4. Jordan GH, Schlossberg SM. Surgery of the penis and urethra. In: Walsh PC, Retik AB, Vaughan ED Jr, Wein AJ, editors. *Campbell's Urology*. 8th

- ed. Vol. 3. Philadelphia: WB Saunder; 2002. p. 3886-952.
5. Andrich DE, Mundy AR. Urethral strictures and their surgical treatment. *BJU Int* 2000;86(5):571-80.
 6. Steenkamp JW, Heyns CF, De Kock MLS. Internal urethrotomy versus dilation as treatment for male urethral strictures: a prospective randomized comparison. *J Urol* 1997;157(1):98-101.
 7. Smith PJB, Dunn M, Roberts JBM. Surgical management of urethral stricture in the male. *Urology* 1981;18(6):582-7.
 8. Gnanaraji J, Devasia A, Gnanaraji L, Pandey AP. Intermittent self catheterization versus regular out patient dilatation in urethral stricture: A comparison. *ANZ J Surg* 1999; 69(1):41.
 9. Khoury JM. Internal Urethrotomy. In: Graham SD, Glenn JF, editors. *Glenn's urologic surgery*. 5th ed. Philadelphia: Lippincott Raven; 1998. p.124-31.
 10. Meneghini A, Cacciola A, Cavarretta L, Abatangelo G, Ferrarrese P, Tasca A. Bulbar urethral stricture repair with mucosa graft urethroplasty. *Eur Urol* 2001;39(3): 64-7.
 11. Dobrowolski ZF, Weglarz W, Jakubik P, Lipczynski W, Dobrowolski B. Treatment of posterior and anterior urethral trauma. *BJU Int* 2002;89(7):752-4.
 12. Shittu OB. Internal optical urethrotomy in the management of urethral strictures in Nigerians: technique and outcome. *Afr J Urol* 2001;7(2):62-5.
 13. Wright JL, Wessells H, Nathens AB, Hollingworth W. What is the most cost-effective treatment for 1 to 2-cm bulbar urethral strictures: societal approach using decision analysis. *Urology* 2006;67(5):889-3.
 14. Naudé AM, Heyns CF. What is the place of internal urethrotomy in the treatment of urethral stricture disease? *Nat Clin Prac Urol* 2005;2:538-45.
 15. Jalbani MH, Shaikh NA. Experience with cold knife optical internal urethrotomy and temporary dilatation. *Pakistan J Med Res*;41(4):145-7.

پوخته

چاره سه ریا تهنگیا میزروا کورت ب برینا دهرونی میزروا کورت ب ریکا دیتنی

نارمانج: بو هه لسه نگاندا کار نه مه دیا برینا میزروا کورت یا دهرونی دهرمانی نه خوشیا تهنگیا میزروا کورت وهک چاره سه ریا سه ره کی.

نه خوش وشیوه: فه کولینهک ب شیوی نایندهنگه ری بو 45 نه خوشین توشی تهنگیا میزروا کورت هاته نه نجامدان کو هاته چاره سه رکن ب برینا دهرونی میزروا کورت ب ریکا دیتنی وپاشی فره کرنا میزروی ب ریکا مایعی ودهست پیکرنا میزکونی ودهر فی وهختی دا فشار دئبخسته سه ر دوماهی یا میزروا کورت دا میزرو فره بیت.

نه نجام: ژیی نه خوشان 22-80 سال بو، وهختی دوویف چوونی 6 هه یف هه تا 3 سالان بو. پلا سه رکه فتنی 88% بو ناریشین پشتی نشته رگه ری بو 6.6% ژ نه خوشان پیشهاتن.

به ره هم: دشین بیژین کو برینا دهرونی میزروی چاره سه ریا سه ره کی یه بو وان نه خوشین تهنگیا و به راهییا میزروی یان تهنگیا پشتی نشته رگه ری هه ی.

الخلاصة

قص الاحليل الداخلى المرئي في علاج تضيق الاحليل

الاهداف: لتقييم مدى كفاءة قص الاحليل بواسطة المنظار في علاج تضيق الاحليل كعلاج اولي.
الطرق و المرضى: اجريت دراسة مستقبلية لعدد من المرضى المصابين بتضيق الاحليل (45 مريض) و الذين عولجوا بواسطة المنظار المرئي في قص الاحليل و تبعها توسيع الاحليل الذاتي بشكل منتظم بواسطة الصوندة او انحباس البول مع وضع ضغط على اقصى الاحليل.
النتائج: تتراوح اعمار المرضى بين 22-80 سنة. فترة المتابعة تتراوح بين 6 اشهر الى 3 سنوات. معدل النجاح كان 88%. معدل المضاعفات 6.6%.
الاستنتاج: يعتبر قص الاحليل بواسطة المنظار الخطوة الاولى لعلاج تضيق الاحليل اذا كان قصيرا و مفردا. و ك ذلك لعلاج تضيق الاحليل الناتج من تضيق الاحليل السابق.