



# Urethral Stricture in Saudi Arabia: Aetiological Spectrum and Results of Endoscopic Urethrotomy

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**In a series of 179 patients, urethral stricture was aetiologicaly related to iatrogenic causes in 38.3%, to specific infections in 21.1% and to accidental trauma in 14.4%. Overall, 69.4% of patients responded favourably to one or more treatments with optical internal urethrotomy (OIU). The results of OIU appeared significantly unrelated to the length of presenting strictures and there were only small differences in relation to aetiological patterns of presentation. (*Asian J. Surgery* 1995;18(1):23-27)**

The introduction of the Sachse direct-vision internal urethrotome in 1974<sup>1</sup> revolutionised the urological outlook in the treatment of urethral stricture. The operating ease and low morbidity of optical internal urethrotomy (OIU) lent it universal appeal over the more onerous surgical undertaking of urethroplasty. Although cure rates were appreciably lower with OIU,<sup>2</sup> the ability to repeat treatment with minimal invasion allowed an acceptable re-definition of treatment goals.

The advancing application and frequency of endo-urological techniques have also altered the aetiological patterns in many countries. In the West, 46-85% of all strictures now appear to be related to iatrogenic causes,<sup>3,5</sup> and there is a suggestion that these strictures do not fare as well with OIU as do those that are associated with infection or with blunt trauma.<sup>6</sup>

In a retrospective 11-year survey of all men treated for urethral stricture at the King Khalid University Hospital in Riyadh, 1983-93, we examined the regional aetiological implications and how these influence established methods of treatment. We also aim to relate the results of OIU with the length of treated strictures at first presentation and with the number of repeat procedures.

## Patients and Methods

The records of all male patients who underwent urological intervention for urethral stricture at the King Khalid University Hospital in Riyadh over the 11-year period, 1983-1993, were examined. Note was made of any aetiological finding located in each case, either from the history or laboratory findings, of the duration and severity of the clinical symptoms, and of any previous treatment. All patients, except those with an obvious distal meatal lesion, had ascending urethrography and most also had uroflowmetry.

There were 179 patients, with ages ranging from one to 85 years, four being children below the age of 12 years. The duration of symptoms ranged from 10 days to 20 years, and 20% of patients tendered a history of previous treatment of their strictures.

At the initial ascending urethrography, the site and extent of the presenting stricture was noted. This was correlated with subsequent endoscopic findings, so that a record was available of the length of the stricture, the degree of fibrosis and any complications such as urethral distortion or false passage.

Wherever this was indicated, OIU was performed with a 20F Storz urethrotome. The strictured segment was cannulated initially with a fine, 3-4F ureteral catheter, providing a guide for the advancing urethrotome, and the incision was made routinely at 12 o'clock, dividing all fibrous tissue to allow free advancement of the instrument. All patients were covered by pre-operative, prophylactic antibiotics. Urethral catheter drainage was used

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routinely, with indwelling periods ranging from 12 hours to six weeks. Sixty percent of cases had post-OIU catheter drainage for four days or less, 32% for five to 15 days and the remaining 8% for longer than 15 days.

Urethroplasties were performed in the standard Johansson two-stage procedure or with a single stage pedicled scrotal flap technique. Meatal strictures were treated simply by meatotomy and dilatation or by meatoplasty.

Patients were followed up with uroflowmetry and if this or the recurrence of symptoms warranted, they were readmitted for repeat endoscopy and calibration of their urethral passages or repeat OIU as necessary. Patients who remained recurrence-free after a reasonable period of follow-up were recorded as cured. Those with some continuing symptoms but with adequate peak flow rates were labelled 'satisfactory' and, in most cases, continued with follow-up.

## Results

Of the 179 patients, 158 (88.3%) had strictures located in the bulbar urethra, with 45 of these (25%) extending into the penile or membranous segments. There were 10 membranous urethral strictures and the remaining 11 patients had short strictures involving the penile urethra or the meatus.

Treatment procedures performed are listed in Table 1. Of the 14 reconstructive urethroplasties performed, eight were for post-traumatic strictures, two for congenital lesions and one for a complicated tuberculous stricture that presented with a 'watering-can perineum' and extensive fibrosis (Fig. 1). In three cases, surgical urethroplasty was undertaken when OIU failed.

**Table 1. Patients and treatment procedures**

	No. of patients	No. of procedures
Optical internal urethrotomy	160	363
Urethroplasty*	14	14
Urethral dilatation	5	5
Meatoplasty	3	3

\* including three patients requiring urethroplasty after failed optical internal urethrotomy

## AETIOLOGICAL SPECTRUM

The annual frequency and aetiology of the presenting urethral strictures is represented in Figure 2. Overall, 38.3% were recorded as being of iatrogenic origin and 14.4% were due to accidental trauma. The majority of the latter followed road traffic accidents and 19 patients (10.6%) also had fracture of the bony pelvis. Twenty-one percent of patients were recorded as having strictures related to sexually-transmitted infections, either from serological findings or from the history.

## RESULTS OF OPTICAL INTERNAL URETHROTOMY

The overall results of OIU are displayed in Table 2. About 24% of patients were cured after a single procedure and a further 13.8% at a second procedure, whilst a further 8.2% responded successfully with five or more OIU procedures (one patient has required 17 successive OIUs). A further 24.5% of patients were recorded as showing a 'satisfactory' result and are continuing follow-up. A total of 45 patients (28.1%) have been lost to follow-up.

Three patients had obvious failures with OIU and were treated with urethroplasty.

The association of the length and aetiological background of urethral strictures with the results of OIU is given in Tables 3 and 4.



**Figure 1.** Ascending urethrography in a man presenting with a 'watering-can perineum' due to tuberculous urethral stricture.

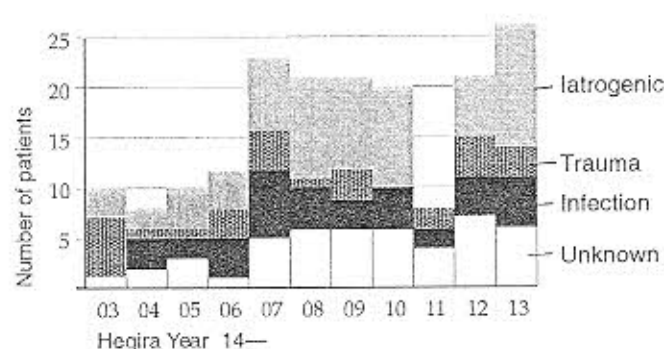


Figure 2. Annual frequency and aetiology of urethral stricture presenting to the King Khalid University Hospital, Riyadh, over the period 1983–1993.

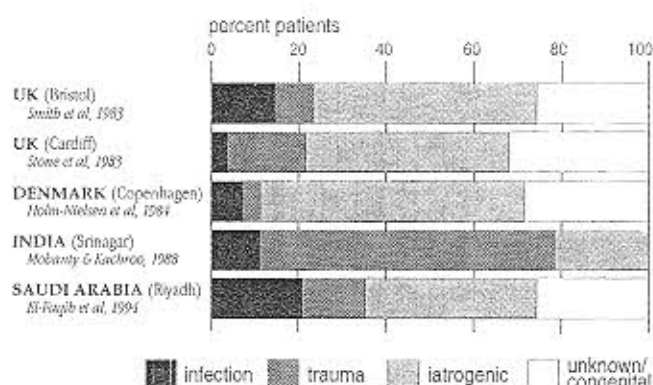


Figure 3. Geographic aetiological spectrum of urethral stricture.

## Discussion

Although proportionately less than in Western countries, iatrogenic complications are the major cause of urethral stricture in our population (Fig. 3). Infections continue to feature prominently in the aetiology, although there is evidence that this is becoming relatively less important in recent years. The relatively small number of patients with strictures due to accidental trauma is accounted for by the fact that the University hospital only shares a small part of the high regional load of road traffic injuries. Nonetheless, the relative numbers of patients presenting with stricture following urethral

trauma in countries in South Asia is notably high.<sup>7</sup>

Experience with OIU in the management of strictures has varied widely. Stone et al, reporting on a three-year experience in Cardiff in the UK,<sup>3</sup> found that 62% of patients 'improved' after one urethrotomy and 71% of the remainder with a second urethrotomy but only one-third of the remaining responded thereafter to repeat treatments. They concluded that OIU was unlikely to succeed if there was no improvement after two treatments – a conclusion that is supported in part by our own findings (Table 2). John et al,<sup>8</sup> however, found that 80% of their 170 patients in Oman with stricture needed only one urethrotomy over a two-year pe-

Table 2. Overall results of optical internal urethrotomy in 157 men with urethral stricture related to number of procedures performed

	Cured		Satisfactory		Lost to follow-up	
	n	%	n	%	n	%
Result after						
1 procedure	38	23.8	1	0.6	30	18.8
2 procedures	22	13.8	16	10.0	10	6.3
3 procedures	6	3.8	6	3.8	3	1.9
4 procedures	6	3.8	3	1.9	1	0.6
5 procedures	1	0.6	3	1.9	1	0.6
> 5 procedures*	0	-	10	6.3	0	-
Total	73	45.6	39	24.4	45	28.1

\* still under follow-up and continuing treatment

**Table 3. Results of optical internal urethrotomy related to length of urethral stricture**

	Cured or satisfactory result after					
	1 procedure		2 procedures		> 2 procedures	
	n	%	n	%	n	%
Length of stricture						
< 5 mm (n = 54)	15	27.8	9	16.7	10	18.5
5–10 mm (n = 48)	11	22.9	12	25.0	14	29.2
> 10 mm (n = 58)	13	22.4	17	29.3	11	19.0

**Table 4. Results of optical internal urethrotomy related to aetiology of stricture**

	Cured or satisfactory result after					
	1 procedure		2 procedures		> 2 procedures	
	n	%	n	%	n	%
Infection (n = 34)	9	26.5	3	8.8	12	35.3
Trauma (n = 17)	2	11.8	5	29.4	3	17.6
Iatrogenic (n = 65)	16	24.6	18	27.7	14	21.5
Unknown/Congenital (n = 44)	12	27.3	12	27.3	6	13.6

riod of follow-up, but that 18 of these patients (10.5%) then required further urethrotomies over the second two-year period of follow-up. The St Peter's Hospital (London) review<sup>2</sup> indicated that 60% of stricture patients responded to one urethrotomy over the first year of follow-up but that this diminished to 50% over a five-year follow-up period. The comparable figures for urethroplasty were 80% and 73%, respectively, suggesting that OIU offers a reasonably acceptable alternative to surgery with the advantage of significantly lower morbidity.

In keeping with the findings of Aagard et al,<sup>9</sup> we found no correlation of the results of OIU with the length of the presenting stricture. However, with respect to aetiology (Table 4), there appeared to be a significantly better response to the first urethrotomy in patients with a stricture related to infection than to trauma or iatrogenic causes. This accords with the report by Holm-Nielsen et al,<sup>6</sup> who found a 92.8% overall cure rate for strictures due to infection and trauma but a 73.7% cure rate with those related to iatrogenic causes.

The optimum period of catheterisation following OIU has not been established, but there appears to be a consensus that prolonged catheter drainage is unlikely to improve the final results.<sup>6,9</sup>

Our report is disadvantaged by the high drop-out rate at follow-up, and it is possible that a significant number of our patients who did not report back after OIU went on to treatment elsewhere. On balance, however, OIU has proven a safe, reliable and easily repeatable alternative to surgery in the primary treatment of urethral strictures, whatever the aetiology.

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