



OUTCOME OF OPTICAL INTERNAL URETHROTOMY FOR SHORT SEGMENT BULBAR STRICTURES

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Abstract:

Optical internal urethrotomy is a commonly done procedure for stricture urethra disease.¹ We evaluated the predictors of outcome of optical internal urethrotomy for short segment bulbar urethral stricture in our institution. Patients with percentage narrowing of less than 60% on Retrograde Urethrogram had a better outcome than patients who had a percentage narrowing of more than 60% (p-value 0.001**). Alternate procedure should be considered in any case with findings of narrowing more than 60% in stricture urethra.

Introduction:

In the west, stricture urethra is more prevalent in the aged population. The incidence increases as the age increases.^{1,2} The disease is more often treated at tertiary centres rather than primary or secondary centres. In contrast, in third world countries, the disease is, by and large, due to infectious, inflammatory or traumatic causes and tends to affect younger population. It is difficult to measure the incidence of stricture urethra. In the west, the incidence rate is more (0.6%) and in excess of 5000 inpatient visits per year have been recorded. But, of late, the incidence has come down in the west owing to the increasing use of anastamotic and substitution urethroplasty procedures.

But in India, male stricture urethral disease remains to be common; trauma and inflammation being the important causes.^{3,4,5} Most often the disease is treated by conservative or minimally invasive techniques like dilatation or internal urethrotomy and hence the recurrence rates are high.

Aims and Objectives:

- 1) To evaluate patients with urethral stricture disease at our institution.
- 2) To predict the outcome of Optical Internal Urethrotomy for short segment bulbar strictures by measuring the percentage of lumen narrowing at ascending urethrogram

MATERIALS AND METHODS

STUDY DESIGN: prospective study

DURATION: September 2013 to March 2015

SETTING: Govt. Stanley Medical College and Hospital Campus

INCLUSION CRITERIA:

Patients with primary bulbar stricture

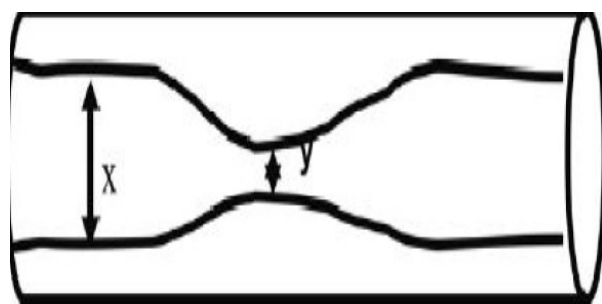
EXCLUSION CRITERIA:

1. Patients with a history of prior intervention
2. Complete block of urethral lumen
3. Stricture greater than 2 cm

Methodology:

A total number of 51 patients were studied in the above period. All patients with primary bulbar urethral stricture were selected. Of those patients, the ones who had any prior intervention in the form of dilatation, Optical Internal Urethrotomy or urethroplasty were excluded. All the patients underwent a standardised preoperative evaluation including basic urine and blood chemistries, uroflowmetry and a good quality Retrograde Urogram.

On the retrograde urethrogram film, the site of the maximal narrowing was measured. The diameter of the normal lumen distal to the stricture site was also taken. The distal urethral lumen was taken as normal as this part is maximally distended while performing a urethrogram rather than the urethral proximal to the stricture. The percentage narrowing was calculated.



$$\text{Percentage narrowing} = [(x-y/x) 100]\%$$

The patients were then subjected to Optical Internal Urethrotomy. Optical Internal Urethrotomy was done using a standard 20 fr sachse urethrotome. Following surgery the patients were advised to self-dilate with 14 fr tieman catheter starting from the 3rd day of removal of Foleys. Foleys was removed on the 7th post-op day. The patients were advised to self dilate for once daily for the first month and then once in 3 days later. Uroflowmetry was done at 3rd and 6th months.

Symptom recurrence, inability to pass the tiemans catheter and the necessity for repeat Optical Internal Urethrotomy were taken as treatment failures.

Results:

Age in years	Number of patients	Percentage
21 – 30	4	11%
31 – 40	12	32%
41 – 50	10	27%
>50	11	30%

In our study of 37 patients, majority of the patients, ie., 32% of them were in the age group of 31 – 40 years;30% more than 50 years; 27 % in 41 – 50 years and 4 patients in the age group 21 – 30 years.

Etiology

Etiology	Number of patients	Percentage
Idiopathic	15	41%
Traumatic	10	27%
Iatrogenic	7	19%
Lichen sclerosis	5	13%

In our study, the most common etiology was found to be idiopathic (41%) followed by traumatic (10%), iatrogenic (19%) and finally lichen sclerosis (13%). Iatrogenic causes include traumatic catheterization or instrumentation.

Stricture length	Number of patients	Percentage
< 1cm	15	41 %
1 – 2 cm	22	59%

Stricture length

In our study, 15 patients (41 %) had a stricture length below 1 cm and 22 patients (59 %) had a stricture length between 1 and 2.

Percentage narrowing	Number of patients	Percentage
40 – 50 %	6	16%
51 – 60%	4	12%
61 – 70 %	12	32%
71 – 80 %	13	35%
81 – 90 %	2	5%

Percentage narrowing in retrograde urethrogram

The percentage narrowing was calculated from the retrograde urethrogram as described previously with the help of a scale or a vernier calipers. It was found that out of the 37 cases, 13 patients had a narrowing in the range of 71 – 80%; 12 patients in the range of 62 – 70%; 6 patients in the range of 40 – 50%; 4 patients in the range of 51 – 60% and 2 patients in the range of 81 – 90%.

Percent-age Nar-rowing	Treatment Success	Treatment Failure
40 – 50%	6	-
51– 60%	4	-
61 – 70%	1	11
71 – 80%	-	13
81 – 90%	-	2

TREATMENT RESULT ACCORDING TO PERCENT-AGE NARROWING ON THE RETROGRADE URETHROGRAM

In our study, out of the 11 patients who did not have recurrence, 6 patients had a percentage narrowing in the range of 40 – 50%; 4 patients had a percentage narrowing in the range of 51 – 60% and one patient had a percentage narrowing in the range of 61 – 70%.

Time of Recurrence	Number of Patients
5 – 7 months	13
8 – 10 months	8
>10 months	5

Time of recurrence in failure cases

Most of the recurrences in the failure patients occurred in the first 5 to 7 months. In our study, out of the 26 treatment failure cases, around 13 patients failed in the first 5 to 7 months. Around 8 patients failed in the first 8 to 10 months and the remaining 5 failure patients had recurrence after 10 months.

		Outcome		Total	P value
% On RGU	<= 60	Count	8	1	9
		% within % On RGU	88.9%	11.1%	100.0%
		% within Outcome	72.7%	3.8%	24.3%
	> 60	Count	3	25	28
		% within % On RGU	10.7%	89.3%	100.0%
		% within Outcome	27.3%	96.2%	75.7%
Total		Count	11	26	37
		% within % On RGU	29.7%	70.3%	100.0%
		% within Outcome	100.0%	100.0%	100.0%

NOTE: ** DENOTES SIGNIFICANT AT 1% LEVEL

PERCENTAGE NARROWING ON RETROGRADE URETHROGRAM - Outcome Cross tabulation

Discussion:

Optical Internal Urethrotomy is a very safe and relatively easy procedure to perform and to learn.⁴ This attribute has made it as the procedure of choice among many urologists worldwide for the treatment of short segment bulbar urethral stricture. But when juxtaposed with urethroplasty, the success rate of Optical Internal Urethrotomy is modest, ie., 50% compared with 83% at 5 years and at 10 years it is around 33 %^{6,7,8}. Although Optical Internal Urethrotomy is being employed so widely, the fact remains that strict guidelines governing the indications and the frequency of Optical Internal Urethrotomy are lacking. Similarly, there may be evidence in literature to suggest that repeat Optical Internal Urethrotomy may actually aggravate the condition of the stricture^{9,10,11}. Therefore it is wise to have some parameters that may be employed to predict the outcome of Optical Internal Urethrotomy in a particular patient so that it may be used more judiciously and on evidence basis.

Objective variables that may forecast a better or a poorer outcome in a particular patient undergoing Optical Internal Urethrotomy may be extremely useful in patient selection and avoidance of unnecessary OIU^{12,13,14}.

The commonest imaging done to evaluate a patient of stricture urethra is Retrograde Urethrogram. But a minor disadvantage with it is that at times it may underestimate the true length of the stricture.

In spite of the above minor disadvantage, in regular urological practice it is the commonest imaging modality employed to decide upon Optical Internal Urethrotomy as a management choice for short segment bulbar stricture^{15,16}.

The wall of normal urethra is relatively thin, smooth and pliable as evidenced by a normal Retrograde Urethrogram. But in cases of stricture or any other urethral pathology, there is frequently fibrosis of the wall of the urethra thus making it non-pliable and thick-walled. This fibrosis of the corpus spongiosum can be objectively assessed by the extent of the narrowing of the urethral lumen on Retrograde Urethrogram^{17,18,19}. In other words, the degree of spongiofibrosis is considered to be a crucial parameter that influences appropriate choice of treatment and the outcome.

Usually, sonourethrogram is the modality that has been traditionally used by urologists to assess the degree of spongiofibrosis at the stricture site by comparing the lumen at the stricture site with that of the normal urethra distal to the stricture site^{20,21,22}. Although sonourethrogram is a good investigation to assess the degree of spongiofibrosis, it is hampered by the fact that it is not widely available, it is more operator dependent and has a relatively low sensitivity and specificity.

Our present study which employs the technique of measuring the percentage narrowing at the site of maximal narrowing on the retrograde urethrogram is more or less an extension of the scientific precept of assessing spongiofibrosis on a sonourethrogram. As in sonourethrogram where the degree of spongiofibrosis is measured by measuring the degree of encroachment of the lumen at the stricture site, here also the narrowing at the maximal stricture site is measured on the Retrograde urethrogram. In other words, the extent of the luminal narrowing on the retrograde urethrogram may be considered a surrogate marker for the degree of spongiofibrosis at that site. It should also be remembered that this measurement is usually not influenced by the position of the patient since the direction of the x-ray beam is almost at right angles to the length that is measured^{16,17,22}. In our study, the degree of narrowing or in other words, the percentage of narrowing at the maximal stricture site on the retrograde urethrogram was found to be associated with the outcome of Optical Internal Urethrotomy. Out of the 37 patients who had undergone Optical Internal Urethrotomy in our study period, 11 patients who had a narrowing of less than 70% had a good outcome. In particular, all the 10 patients who had a narrowing in the range of 40 – 60% had good outcome with no recurrence till date. On the other hand, out of the remaining 27 patients who had a narrowing of more than 60 % on the Retrograde Urethrogram 26 patients had treatment failure and required repeat treatment at some point during the follow-up.

Thus this method of using the percentage narrowing at the stricture site on a good Retrograde Urethrogram is a very useful method of judging the degree of spongiofibrosis at the stricture site which in turn can be used to predict the outcome of Optical Internal Urethrotomy^{12,15} .

Factors which can influence the measurement are under-distension and over distension of the distal urethra thus affecting the calculation of the percentage since the lumen of the distal urethra forms the denominator in our calculation. In order to ascertain correct filling of the distal urethra, a few hints may be taken into consideration. If there is entry of contrast into posterior urethra, it suggests a correct filling the distal urethra. In the same way if there is intravasation of contrast, it denotes overfilling and such urethrograms must be excluded and a fresh retrograde urethrogram may be ordered^{13,18} .

Other factors like length of the stricture, site of the stricture and etiology of the strictures being equal, the degree of narrowing on the Retrograde Urethrogram may play a crucial role in the result of Optical Internal Urethrotomy . Thus it may be used in prognosticating or predicting the outcome of Optical Internal urethrotomy. Studies have also indicated that a repeat Optical Internal urethrotomy does not alter the overall results, thus a repeat Optical Internal Urethrotomy may not after all be a good option in cases of failures^{22,18}.

Though there is nothing in the literature to say that multiple Optical Internal Urethrotomies may influence the outcome of a future urethroplasty, it would be prudent to restrain from doing multiple OIUs in a particular patient as there is a chance of worsening the fibrosis and increasing the length of the stricture thereby precluding the possibility of a anastamotic urethroplasty and necessitating a substitution urethroplasty^{16,19} .

Based on our present study, though the sample size is not great, there is a rough indication that those patients with a percentage narrowing of less than 60% on the Retrograde Urethrogram had a better outcome with Optical Internal Urethrotomy than those with a percentage narrowing of more than 60%. This result was found to be statistically significant with a p-value of $<0.001^{**}$. One of the limitations which we had encountered in our study was in the follow-up of the patients and the compliance of the patients to our instructions. Though we had given explicit instructions to the patient with regard to the follow up timetable, many patients turned up late and a few did not turn up at all who were excluded from the study^{15,22} . In the same way, though the patients were properly instructed and demonstrated on the Clean Intermittent Self Catheterisation technique, a few patients had not performed it. Another issue was the tool used to measure the degree of narrowing on the Retrograde Urethrogram. Vernier calipers or a conventional foot scale was used for measuring.

Sometimes the x-ray quality was not good enough to allow precise measurement of the degree of narrowing especially conventional film x-rays. With digital x-rays it was possible to measure the narrowing on the console. These issues may have to be addressed and taken into consideration when conducting and interpreting any study of this nature and similarity^{20,22}.

Conclusion:

Though Optical Internal Urethrotomy is a simple and safe procedure for bulbar urethral stricture patients it should not be used indiscriminately. Improper selection of patients may necessitate multiple procedures on the same patient thus adversely affecting the quality of life and economic well-being of the patient.

An easy way to assess the degree of spongiosis without using a sonourethrogram is calculating the percentage narrowing at the maximal site of stricture on a Retrograde Urethrogram. This may be used to predict the outcome after Optical Internal Urethrotomy. In our study, patients with percentage narrowing of less than 60% on Retrograde Urethrogram had a better outcome than patients who had a percentage narrowing of more than 60% (p-value 0.001**). Thus alternate treatment may be considered for such patients who have a high degree of narrowing on the Retrograde Urethrogram.

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