

TREATMENT OF MALE URETHRAL STRICTURES: IS REPEATED DILATION OR INTERNAL URETHROTOMY USEFUL?

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ABSTRACT

Purpose: We evaluate the efficacy of repeated dilation or urethrotomy as treatment of male urethral strictures.

Materials and Methods: Between January 1991 and January 1994, 210 men with proved urethral strictures were prospectively randomized to undergo filiform dilation (106) or internal urethrotomy (104). Followup was scheduled at 3, 6, 9, 12, 24, 36 and 48 months. Dilation or internal urethrotomy was repeated at the first and second stricture recurrence. The Kaplan-Meier method was used to estimate survivor function for the treatment methods (survival time being the time to first stricture recurrence) and the log rank test was used to compare the efficacy of different treatments.

Results: Followup (mean 24 months, range 2 to 63) was available in 163 patients (78%). After a single dilation or urethrotomy not followed by re-stricturing at 3 months, the estimated stricture-free rate was 55 to 60% at 24 months and 50 to 60% at 48 months. After a second dilation or urethrotomy for stricture recurrence at 3 months the stricture-free rate was 30 to 50% at 24 months and 0 to 40% at 48 months. After a third dilation or urethrotomy for stricture recurrence at 3 and 6 months the stricture-free rate at 24 months was 0 ($p < 0.0001$).

Conclusions: Dilation and internal urethrotomy are useful in a select group (approximately 70% of all patients) who are stricture-free at 3 months, and of whom 50 to 60% will remain stricture-free up to 48 months. A second dilation or urethrotomy for early stricture recurrence (at 3 months) is of limited value in the short term (24 months) but of no value in the long term (48 months), whereas a third repeated dilation or urethrotomy is of no value.

KEY WORDS: urethral, stricture, treatment outcome

The first known form of treatment for male urethral stricture was dilation but currently optical internal urethrotomy is widely considered as first line therapy.¹⁻⁴ Earlier studies reported a success rate of 66 to 95% for internal urethrotomy^{2,5-13} but later studies showed that with longer followup the recurrence rate after urethrotomy varied from 62 to 89%.^{14,15} There appear to be few studies comparing the efficacy of dilation and internal urethrotomy but at least 2 groups have reported that these procedures are equally efficacious as initial treatment of male urethral strictures.^{16,17} Previous studies have indicated that repeated urethrotomy may be worthwhile, even for extensive and multiple strictures, and have suggested that in elderly and unfit patients urethrotomy can be performed 5 to 6 times.⁶ However, other studies have shown that repeated urethrotomy achieved only temporary improvement.^{14,18} We determine whether repeated dilation or urethrotomy is worthwhile for stricture treatment.

PATIENTS AND METHODS

From January 1991 to January 1994, 210 consecutive men with proved urethral strictures were randomized to undergo dilation (106) or internal urethrotomy (104). Preoperative evaluation included a complete history and physical examination, urine culture and urethrography under x-ray fluoroscopy. The only exclusion criterion was if the urethrogram showed complete occlusion of the urethra.

All procedures were performed on an outpatient basis by a single surgeon (J. W. S.). Lignocaine jelly was instilled into the urethra and antibiotic prophylaxis was administered with intravenous injection of 80 mg. gentamicin. In patients randomized to undergo dilation a Philips filiform leader was passed through the stricture under direct urethroscopic vision using a

19F rigid cystoscope, after which dilation to 24F was performed with serial filiform followers. In patients randomized to undergo internal urethrotomy a 5F whistle tip ureteral catheter was passed under direct urethroscopic vision, after which optical internal (Sachse) urethrotomy was performed in the 12 o'clock position using a 21F urethrotome. In all patients an 18F silicone Foley catheter was passed, the patient was discharged home and the catheter was removed 4 days later.

Followup was scheduled for 3, 6, 9, 12, 24, 36 and 48 months after the initial procedure. Retrograde urethrography was performed under fluoroscopic control and a transurethral 16F catheter was passed. If recurrence of the stricture(s) was found the primary procedure was repeated. If more than 3 recurrences of the stricture occurred in 1 year urethroplasty was performed. The Kaplan-Meier method was used to estimate survivor function for the 2 treatment methods (survival time was regarded as the time to first stricture recurrence) and the log rank test was used to compare the efficacy of treatments.

RESULTS

Followup was available in 163 patients (78%) (mean 24 months, range 2 to 63). Kaplan-Meier survival function analysis showed that the estimated stricture-free rate at 48 months was 39% after internal urethrotomy and 12% after dilation but the difference was not statistically significant ($p = 0.13$) (fig. 1). This finding has been reported previously.¹⁷ The median time to stricture recurrence was 12 months after urethrotomy and 6 months after dilation. For the purpose of further analysis, dilation and urethrotomy were regarded as equivalent forms of treatment, and the entire group of patients was used to determine the effect of repeated treatment on stricture recurrence. When all patients were

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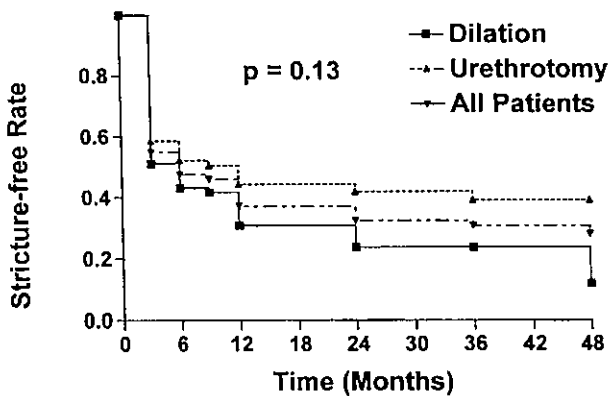


FIG. 1. Stricture-free rate after dilation or internal urethrotomy and in entire study group.

considered, the estimated stricture-free rate after a single initial treatment was about 30% at 24 and 48 months (fig. 1).

Before randomization 68 patients (32%) had undergone previous stricture treatment including dilation in 17 (8%), internal urethrotomy in 47 (22%) and urethroplasty in 8 (4%). (Some patients had more than 1 form of treatment.) In most cases these procedures had been performed more than 6 months before randomization. Stricture-free survival, calculated from the time of first study treatment, did not differ significantly between the groups with and without stricture treatment before study entry ($p = 0.76$).

The stricture-free rate after dilation or internal urethrotomy of the entire cohort, regardless of previous stricture treatment, was compared among those who underwent only 1 treatment at study entry and were stricture-free at 3 months (73 patients at risk), those who had a second treatment for stricture recurrence at 3 months (20), and those who had a third treatment for recurrences at 3 and 6 months after initial treatment (14) (fig. 2). Stricture-free survival was calculated from the time of the last treatment. In these patients the estimated stricture-free survival after 1, 2 or 3 repeated treatments was approximately 60, 30 and 0% at 24 months, and about 60, 0 and 0% at 48 months, respectively ($p < 0.0001$) (fig. 2). Thus, of the total of 107 patients at risk 73 (68%) who were stricture-free at 3 months after 1 initial treatment maintained a stricture-free rate of 60% at 48 months. Median time to recurrence was 21 months after 2 treatments and 4.5 months after 3 treatments.

The recurrence rate after dilation or internal urethrotomy in patients not treated before randomization was compared among those who had only 1 treatment at study entry (56

patients at risk), those who had a repeated procedure for stricture recurrence at 3 months (16) and those who underwent a third treatment for recurrences at 3 and 6 months after initial treatment (8) (fig. 3). Stricture-free survival was calculated from the time of the last treatment. In these patients the estimated stricture-free rate after 1, 2 or 3 repeated treatments was approximately 60, 40 and 0% at 24 months, and about 50, 0 and 0% at 48 months, respectively ($p < 0.0001$) (fig. 3). Thus, of the 80 patients without previous treatment 56 (70%) who were stricture-free at 3 months after initial treatment maintained a stricture-free rate of 50% up to 48 months. When previous stricture treatment was considered as the first treatment, dilation or urethrotomy at study entry as second treatment and repeated dilation or urethrotomy for recurrence at 3 months as third treatment, the estimated stricture-free survival, calculated from the time of the last treatment, was approximately 55, 50 and 0% at 24 months, and about 50, 40 and 0% at 48 months after 1, 2 or 3 repeated treatments, respectively ($p < 0.0001$) (fig. 4).

DISCUSSION

Although the success of urethrotomy at 5 years is less than that of urethroplasty (50% compared to 83% in 1 study³), the ease and safety of urethrotomy make it the procedure of first choice for the treatment of male urethral strictures.¹⁻⁴ Despite initial enthusiasm for the new technology, laser urethrotomy appears to offer no advantage over conventional internal urethrotomy.^{5,19}

Few studies have compared the efficacy of dilation and internal urethrotomy. In a retrospective study of 199 men with strictures treated at the Mayo Clinic between 1976 and 1990, 101 (67%) underwent dilation and 39 (26%) underwent direct vision internal urethrotomy.¹⁶ The strictures were primarily iatrogenic (47%), less than 2 cm. long (96%), single (99%) and in the bulbar urethra (57%). At a median followup of 3.5 years the probability of not requiring re-treatment within 3 years was 65% for dilation and 68% for urethrotomy, indicating that these procedures were equally efficacious as initial treatment of bulbar strictures.¹⁶ Our previous report of the present prospective study cohort of 210 patients with a mean followup of 15 months showed no statistically significant difference in the stricture recurrence rate between dilation and urethrotomy.¹⁷

The recurrence rate after internal urethrotomy or dilation is lower for single, short (less than 1 to 2 cm.) bulbar strictures,^{2,14,17} and the risk of recurrence is higher for penile strictures and those with periurethral scarring.^{14,17,20} Previous studies have shown that nearly one-half to two-thirds of strictures recur within the first year after treatment,^{17,19,21,22} with a median interval to recurrence of 4

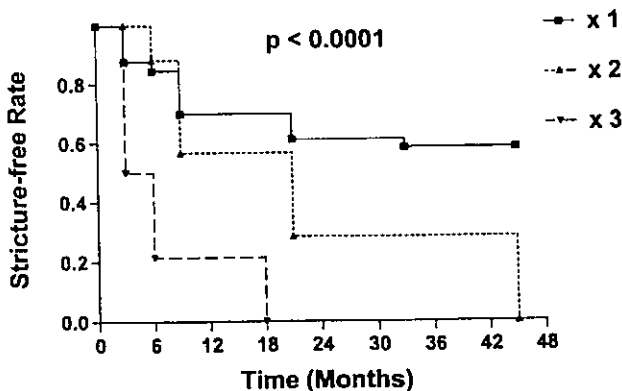


FIG. 2. Stricture-free rate after 1, 2 or 3 times (x1, x2, x3) repeated dilation or internal urethrotomy of entire study group, regardless of stricture treatment before randomization.

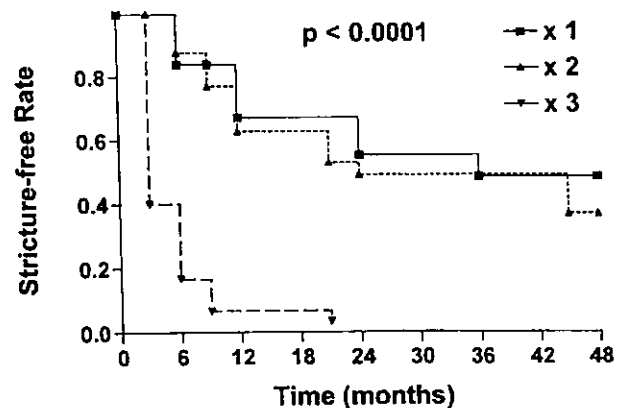


FIG. 3. Stricture-free rate after repeated dilation or internal urethrotomy (x1, x2, x3) in patients not treated before randomization.

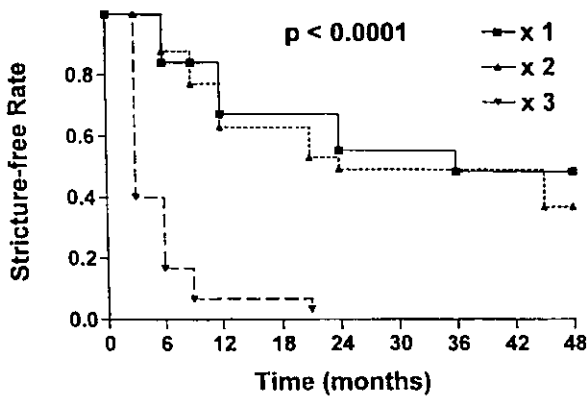


FIG. 4. Stricture-free rate after repeated dilation or urethrotomy ($\times 1$, $\times 2$, $\times 3$) when stricture therapy before randomization was considered as first treatment.

months.¹⁵ In our study the median time to recurrence was 12 months after urethrotomy and 6 months after dilation. However, strictures can recur up to 8 years after urethrotomy and, thus, followup to 10 years is recommended.²³

Several solutions for stricture recurrence have been suggested, including endoscopic resection of callus or injection of steroids, such as triamcinolone acetonide.¹¹ Clean intermittent self-catheterization can prevent stricture recurrence, provided it is continued for more than 12 months.^{15, 24-26} Recurrent strictures may be managed with urethral stenting but this is expensive.^{27, 28} There is controversy as to whether repeated urethrotomy is worthwhile.^{6, 14, 18} Our study shows that dilation and internal urethrotomy are equally effective as initial treatment for male urethral strictures, and are useful in a select group (approximately 70% of all patients) who are stricture-free at 3 months, and of whom 50 to 60% will remain stricture-free up to 48 months.

CONCLUSIONS

A second dilation or urethrotomy for early stricture recurrence (at 3 months) is of limited value in the short term (24 months) but of no value in the long term (48 months). However, if the stricture recurs more than 6 months after initial treatment a second dilation or urethrotomy may produce a stricture-free rate of 40% at 48 months (fig. 4). A third repeated dilation or urethrotomy for stricture recurrence at 3 and 6 months is of no value, with a stricture-free rate of 0% at 24 months. It has been suggested that urethroplasty has a higher failure rate in patients primarily treated with 3 or more urethrotomies within a short time, and open surgical repair is advised when 1 or 2 urethrotomies fail.²⁹ However, in elderly and unfit patients with a limited life expectancy, repeated urethrotomy or dilation may be useful to obviate the need for urethroplasty.⁶

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