

THE LONG-TERM RESULTS OF URETHROPLASTY

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ABSTRACT

Purpose: We update our long-term data on the effectiveness of urethroplasty.

Materials and Methods: A total of 166 patients operated on before 1990 are currently under followup or lived at least 10 years after surgery. Anastomotic urethroplasty was performed in 82 patients and substitution urethroplasty in 84.

Results: The 5, 10 and 15-year re-stricture rates after anastomotic urethroplasty were 12%, 13% and 14%, respectively, and the complication rate was 7%. The 5, 10 and 15-year re-stricture rates after substitution urethroplasty were 21%, 31% and 58%, respectively, and the complication rate was 33%.

Conclusions: The results of anastomotic urethroplasty are good and sustained in the long term, while the results of substitution urethroplasty deteriorate steadily with time and there is definite room for improvement. An anastomotic repair should be performed in preference to a substitution repair when possible.

KEY WORDS: urethral stricture; anastomosis, surgical; postoperative complications

Urethroplasty has been in common use for more than 50 years. Despite this fact and numerous descriptions of the technique there are no published long-term results. Previous reports on urethroplasty mix different types together and include relatively short-term data.¹⁻⁴ Given that it has been routine for many years to report the results of cancer surgery in terms of 5, 10 and 15-year survival rates, it seems desirable to report surgery for other conditions in a similar way. We reported previously followup data on a cohort of 200 patients who had undergone urethroplasty, and compared the differences in outcome between anastomotic and substitution urethroplasty.⁵⁻⁷ We update our long-term data on this cohort of patients.

PATIENTS AND METHODS

A cohort of 201 patients underwent urethroplasty between 1981 and 1990, of whom 35 were lost to followup. The remaining 166 patients are currently under followup (155) or died of unrelated causes after at least 10 years of followup (11). These 166 patients were 8 to 73 years old at the time of urethroplasty (mean age 47.2).

The etiology of the strictures is shown in table 1. All 48 patients with traumatic strictures or defects presented with indwelling suprapubic catheters. Of the remaining 118 patients 39 also had indwelling suprapubic catheters at the time they were referred for urethroplasty. In 57 patients it was not clear how much of the current stricture problem was due to an initial inflammatory or infective condition and how much was due to repeated instrumentation. In 50 patients there was no apparent cause of the stricture in 34 of these 50 patients the stricture was bulbar and short enough for excision and end-to-end anastomosis, and in 16 a substitution repair was necessary. The remaining 11 patients had penile urethral strictures following either repeated surgery for hypospadias or long-standing lichen sclerosus (balanitis xerotica obliterans).

All patients with nontraumatic strictures had undergone repeated instrumentation in many instances for many years.

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Except for the 34 patients with idiopathic bulbar strictures who were still amenable to anastomotic urethroplasty, the remaining patients were only referred for urethroplasty when the stricture was regarded as impassable or when dilation or urethrotomy was frequent or regularly associated with bleeding or a septic episode.

An ascending urethrogram and voiding cystogram were performed in all patients preoperatively to determine stricture length and location. Patients with traumatic strictures or short strictures of the bulbar urethra underwent anastomotic urethroplasty using the techniques developed by Marion,⁸ Turner-Warwick⁹ and Waterhouse et al,¹⁰ refined and promulgated by Turner-Warwick,⁹ and then defined and popularized as a progressive approach by Webster and Ramon.¹¹ Initially most surgery for pelvic fracture urethral distraction defects (PFUDD) was performed abdominoperineally. Subsequently almost all surgery for PFUDD and bulbar strictures amenable to anastomotic repair was performed transperineally. Details of the surgical procedure are described elsewhere.¹² Longer strictures of the bulbar urethra and all strictures of the penile or pendulous urethra were treated by substitution urethroplasty using a 1-stage onlay flap technique, generally of penile or preputial skin.^{9,13-17} When necessary scrotal skin flaps were used.¹⁸

Postoperatively all patients were followed with symptomatic assessment and urinary flow rate studies at 3 months, 6 months and annually thereafter, with an ascending urethrogram and voiding cystogram at 3 to 6 months postoperatively and then a year or so later. Subsequent radiological assessment and endoscopy were only performed if the symptoms developed or flow rate deteriorated.

RESULTS

Of the 166 patients 11 died of unrelated causes but only after 10 years of followup and they are included in this review. The re-stricture rates at 1, 5, 10 and 15 years after anastomotic urethroplasty and substitution urethroplasty are shown in table 2. Re-stricture is defined as symptoms and investigations showing the presence of a recurrent stricture whether or not patients chose to have further treatment. The results of anastomotic urethroplasty were good and sustained in the long term, whereas those after substitution

TABLE 1. *Etiology*

	No. Pts
Anastomotic urethroplasty:	
Pelvic fracture	39
Straddle	9
Idiopathic bulbar stricture	34
Total	82
Substitution urethroplasty:	
Iatrogenic/inflammatory	57
Idiopathic	16
Post-hypospadias surgery	7
Lichen sclerosus	4
Total	84

repair steadily deteriorated with time so that by 15 years more than half of the patients required evaluation for further treatment.

The complications after substitution urethroplasty are listed in table 3. There were marked differences between the 2 groups, as erectile dysfunction (6 of 82 patients, 7%) was the only complication of anastomotic repair and occurred almost exclusively after repair of a PFUDD. After substitution urethroplasty complications (28 of 84 patients, 33%) were 5 times more common and generally related to out-pouching of the repair and failure of the urethra to empty after voiding with consequent irritative or infective symptoms.

Many patients noticed a degree of urgency and stress incontinence with a full bladder after anastomotic repair for a PFUDD, which was attributed to loss of sphincter function as a result of the original injury rather than to the surgery and which improved with time. In both groups there was a definite incidence of erectile dysfunction in the early postoperative weeks, which was higher in the anastomotic group (26%) than in the substitution group (10%), and usually resolved within 2 to 3 months.

DISCUSSION

The literature on re-stricture rates after urethroplasty is sparse with no data on other complications, although anecdotally other surgeons seem to have had similar experiences with substitution urethroplasty. Jenkins et al reported a 20% re-stricture rate after anastomotic urethroplasty in 73 patients followed 1 to 20 years,¹ and Rogers et al reported a 7% re-stricture rate in 211 patients followed 3 to 20 years after substitution urethroplasty.² These rates are almost the reverse of our experience. After more than 5 years of followup Hermanowicz et al reported a 52.4% re-stricture rate in 287 patients³ and de Jong et al reported a re-stricture rate of 67.9% in 56 patients.⁴ All of these reports noted that stricture may recur as long as 15 years after an apparently successful urethroplasty.

The diagnosis of re-stricture is a subject for debate. In our patients the diagnosis was made when symptoms and further investigation showed a recurrent stricture. Clearly other patients may have had a recurrent stricture but unless they were symptomatic, the recurrences would have been overlooked. However, faulty as the nature of the diagnosis of re-stricture is in this review, it is the way in which re-stricture has been diagnosed in nearly every report on the results of the urethroplasty to published data.

Our data are by definition historical. They represent a

TABLE 2. *Re-stricture rates with time*

Yrs	% Anastomotic	% Substitution
1	7	12
5	12	21
10	13	31
15	14	58

TABLE 3. *Complications of substitution urethroplasty*

	%
Erectile dysfunction	2
Post-void dribble	28
Palpable or visible pouch	12
Urinary tract infection	5
Urethrocuteaneous fistula	3
Chordee	3

learning curve and, although the techniques of anastomotic urethroplasty used are still more or less the same, the approach to substitution urethroplasty has changed considerably. Today grafts have largely replaced flaps for the repair of bulbar strictures¹⁹ and 2-stage repairs have replaced 1-stage flap repairs for difficult penile urethral strictures.²⁰ Our as yet unpublished 5 to 10-year data for this current approach to substitution urethroplasty suggest that we are getting significantly lower re-stricture rates but there is still a tendency for deterioration with time.

Perhaps more importantly the patient population has changed. Patients before 1990 were on average 10 years old and most had impassable strictures that had been subjected to years of instrumentation. Bulbar strictures were much more common than penile strictures. Today patients are younger and have usually undergone far fewer urethrotomies or dilations before being referred for urethroplasty, although the use of repeated instrumentation or self-catheterization is still depressingly common. On the other hand, patients are more critical of surgical outcomes today. Post-void dribble, for example, which is the most common complication of substitution cystoplasty, was quantitatively more severe in the series described than it is today but it is also a more frequent complaint of patients now than in the past. However, the fact that patients are being treated earlier and more selectively with a wider range of surgical options seems to be the main reason that our 1990 to 2000 cohort of patients will experience significantly better long-term results than earlier cohorts.

CONCLUSIONS

The results of anastomotic urethroplasty are good, sustained and associated with a low complication rate so that it should be performed in preference to a substitution repair when possible.⁶ It seems unlikely that there will be any new technique in the future that will be significantly better for strictures. In contrast, the results of substitution urethroplasty are less satisfactory with a definite tendency to deteriorate with time and considerable room for improvement.

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