ROLE OF WALLSTENT® IN URETHRAL STRICTURE

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Urethral stricture is still a difficult urological disease entity to cure. Commonly used methods of urethral dilatation and optical urethrotomy are associated with a significant recurrence rate.[1] Urethroplasty is usually successful in the treatment of many types of urethral stricture,[2] but the results are not so encouraging in iatrogenic and post-infection strictures.[3] As a more conservative approach to recurrent stricture disease, a self-expandable stainless steel stent first used in cardiovascular systems has been used successfully for strictures of the urethra.[4] We report our experience with the urethral stent in eight patients.

Materials and Methods

Over a four-year period, eight men with recurrent urethral stricture disease were treated with a urethral Wallstent (Medivent SA, Lausanne, Switzerland, supplied by American Medical Systems). The clinical features of each patient are detailed in Table 1. Their age ranged from 24 to 67 years (mean = 46). All the strictures had been treated by various methods. The stricture was located in the bulbar urethra in six patients who had been treated with multiple dilatations and optical urethrotomy. One of the patients had a stricture in the supramembranous urethra, secondary to a pelvic fracture sustained in a road traffic accident. This patient had had urethroplasty twice previously. Another patient had developed detrusor-sphincter dyssynergia (DSD) as a result of cervical spinal cord injury in a road traffic accident. The length of stricture was from 1 cm to 3 cm, while the patient with DSD had a functional stricture of the whole posterior urethra. The maximum preoperative flow rate ranged from 0 mL to 8 mL per sec. (mean=3), as shown in Table 2. One of the patients with bulbar urethral stricture was passing urine in drops with no recordable flow, and the same was the case in the patient with the urethral stricture after pelvic fracture.

The etiology of the strictures was infection in three cases, transurethral resection of the prostate in one, pelvic fracture in one, and DSD in one. The cause of stricture was unknown in two patients who had been having voiding problems since childhood.

We used an endoscopic applicator for introduction of the stent in all cases. The length of the stent was 2 cm in two patients and 3 cm in three patients. Three patients required more than one stent overlapping each other, either because of the length of the stricture or initial placement of an undersized stent. The patients were followed at three-month intervals. Flow rates were checked regularly, ascending urethrogram (Figures 1A and B) and urethroscopy were performed when flow rate started to deteriorate.

Results

The follow-up period ranged from 15 to 74 months (mean 48.1). Five patients (62.5%) were able to micturate well with satisfactory flow rates (Table 2) and without a need for further procedures. These included the patient

TABLE 1. *Clinical features.*

Age (ys)	Etiology of stricture	Duration (ys)	Site of stricture	Length of stricture
51	Unknown	40	Bulbar urethra	1 cm
67	Post-TURP	2	Bulbar urethra	2 cm
32	Inflammatory	4	Bulbar urethra	2-3 cm
50	Urethral catheterization	10 mon.	Bulbar urethra	3 cm
52	Road traffic accident	12	Membranous	3 cm
24	Detrusor-sphincter dyssynergia	5	Posterior urethra	7 cm
26	Unknown	>5	Bulbar urethra	2 cm
34	Post-cystolithotomy	Since childhood	Bulbar urethra	2 cm

TABLE 2. *Results.*

Duration of follow-up (mon.)	Preoperative flow rate	Postoperative flow rate	Further procedures
14	Not recordable	25.6 mL/sec.	Nil
12	8 mL/sec.	14 mL/sec.	Nil
59	6 mL/sec.	22 mL/sec.	Optical urethrotomy
26	3 mL/sec.	13 mL/sec.	Optical urethrotomy
51	Not recordable	8 mL/sec.	Nil
48	Not recorded	Not recorded	Nil
24	3.6 mL/sec.	18 mL/sec.	Nil
23	3.9 mL/sec.	43 mL/sec.	Nil

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Accepted for publication 14 June 1998. Received 18 March 1997.

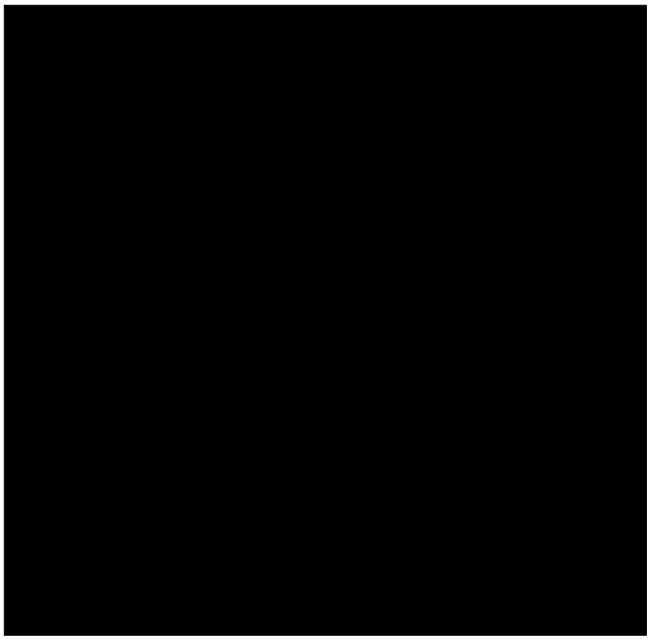

FIGURE 1A. Plain x-ray demonstrating urolume Wallstent in position.

FIGURE 1B. Ascending urethrogram showing wide open bulbar urethra at the site of stricture.

with DSD who had been unable to empty his bladder after three internal sphincterotomies. Two patients developed recurrent stricture distal to the stent, which was managed by one session of optical urethrotomy each. Another patient with a previous history of urethroplasty developed re-growth of fibrous tissue inside the lumen of the stent, leading to deterioration of the flow rate. This patient was satisfied even with the weak urination and as there was no urinary tract infection (UTI), we have refrained from performing further procedures.

Two patients developed UTI during the follow-up period. In one case, this was associated with recurrence of the stricture. The other patient with DSD had an improvement in the frequency of infections, as compared to the period before the placement of the stent.

Most of the patients complained of discomfort in the perineal area in the immediate postoperative period, but this resolved in all cases over the next few months. Three patients complained of postmicturition dribbling, and one had stress leakage of urine. In four to six months, dribbling and leakage of urine resolved. One patient had a complaint of leakage of urine during erection, which disappeared spontaneously after 13 months.

Discussion

The frustration of dealing with urethral strictures recurring after repeated urethral dilation, optical urethrotomy and/or urethroplasty is experienced by all urologists. The concept of maintaining the patency of a lumen with a self-retaining endoprosthesis is neither new nor unique to urology.[5] Intraluminal stents have been used since 1969 to prevent stenosis after balloon angioplasty.[6,7] The use of urethral stents to prevent recurrence of urethral strictures was first reported by Miller et al.,[4] and was later tried in a number of European urological units.[8,9] There has been recent enthusiasm about the use of urethral stents in the recurrent urethral strictures, giving good short-term results.[10-12] Various modifications in the material and shape of the stent have been made to make it more tissue compatible and easier to remove if the need arises.[10-12]

Our experience in the use of Wallstent in eight patients has been encouraging. Minimal complications have been encountered and the patients have been generally satisfied with the outcome of the procedure. Postmicturition dribbling and perineal discomfort resolved after a short period. Most patients with urethral stents complain of postmicturition dribbling of urine for four to six weeks. This has been suggested to be due to postmicturition trickling out of the urine remaining within the lumen of the stent.[13] Perineal discomfort has been reported in up to 42% of the patients.[14] This complaint usually resolves in four to six weeks. These patients are advised to avoid physical activities which may lead to local trauma.[13] Leakage of some urine at the time of seminal ejaculation in one patient could not be explained, since the stent was not interfering with the bladder neck function. Two patients who developed restricture close to the stent were managed by optical urethrotomy. Recurrence of the stricture after placement of the stent is more common at either end, and is probably a reaction to the stent itself[13,15] and extensive periurethral fibrosis. Polypoidal hyperplasia involving the urothelium and underlying connective tissue has been observed which showed evidence of keratinizing squamous metaplasia of the luminal urothelium on microscopic examination.[16] The patient with two previously failed urethroplasty operations developed growth of fibrous tissue

into the stent on urethrogram. This is a well-known phenomenon, occurring especially in patients who have had previous urethroplasty.[14,17] This may block the lumen of the stent, and the possible cause may be that the squamous epithelium of the inlay urethroplasty reacts in a more florid way than the normal urethral epithelium. The recommendation is that the traumatic strictures should not be managed with the urolume Wallstent.[8] The urine stream of our patient deteriorated during follow-up, but he became stable and was satisfied with his urination. He has not needed urethral dilatation over the last three years. These results of high patient satisfaction with a low failure rate have been maintained at four to six years' follow-up.[18] However, the chances of recurrence of the urethral stricture are higher with extensive periurethral fibrosis. The quadriplegic patient with DSD was again a therapeutic challenge. He had not been able to empty his bladder in spite of three previous attempts at sphincterotomy, with frequent infections needing hospitalization. The stent has been used successfully for the treatment of DSD after spinal injury.[19,20] Our experience of using the stent in this patient has been rewarding. The patient can now empty his bladder, and has very infrequent infections. Recently, concern has been shown about the potential danger of developing squamous cell carcinoma in these patients.[16] None of our patients has shown any such malignant change, however, longer follow-up is required in these patients.

In conclusion, Wallstent is an alternative form of treatment for the difficult recurring bulbar urethral stricture, and it may be one of the options for treatment of a patient with detrusor-sphincter dyssynergia.

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