Management of urethral strictures in children

Accepted: 17 August 1995

Abstract We report the results of a long-term follow-up study in 78 children with urethral strictures. The ages ranged from 1 month to 20 years and the follow-up from 8 months to 15 years (average 5.9 years). Balloon dilation was the primary treatment in 66 patients. Manipulative management (balloon dilation and endoscopic urethrotomy) was performed in 68 cases and was successful in 55. There were no complications. Balloon dilation alone provided an 80% success rate (53/66). Twenty-two patients were treated by one-stage urethroplasty, with an overall 95.5% success rate. The surgical repair was performed in 12 patients as a secondary procedure after failure of conservative treatment. Our data do not support the rather poor results usually reported in the pediatric literature associated with the balloon dilation technique.

Key words Urethral strictures • Urethral dilation • Urethroplasty

Materials and methods

The purpose of this paper is to present a series of 78 cases of USD treated at our surgical department with particular focus on the procedure of urethral dilation using an inflatable balloon catheter.

The records of all patients admitted to our surgical department with the diagnosis of USD were reviewed. Between 1978 and 1994, 78 patients were diagnosed as having USD; meatal stenosis was excluded. The patients’ ages ranged from 1 month to 20 years, with an average of 9 years.

According to Kaplan and Brock, urethral strictures are ascribed to four etiologies: iatrogenic, congenital, traumatic, and inflammatory [3]. Strictures were considered iatrogenic if they occurred following surgery, endoscopy, or catheterization. They constituted the largest group in our series, with a total of 67 cases. Fifty-one patients developed strictures after urethral surgery. Of these, 47 were secondary to hypospadias repair, 2 occurred after posterior urethral valve fulguration, and the remaining 2 resulted after urethral sphincterotomy performed in neurogenic bladders before an artificial sphincter implant. In 10 patients strictures were secondary to urethral catheterization and in 6 they occurred following endoscopic examinations.

Iatrogenic strictures involved the anterior urethra in 61 patients (57 penile, 4 bulbous) and the posterior urethra in the remaining 6 (5 membranous, 1 prostatic). Most of the patients with USD secondary to surgery or catheterization had been previously operated upon or treated elsewhere.

Strictures were considered congenital if recognized in patients without a history of trauma, inflammation, instrumentation, or surgery. We identified 7 patients with congenital strictures: the bulbous urethra was involved in 4 and the membranous urethra in 3. Four of the 7 congenital strictures were discovered before 1 year of age (2 in the neonatal period). Of these, 2 were initially managed at our hospital and 2 were unsuccessfully operated upon elsewhere. No congenital stricture had the endoscopic appearance of a urethral valve.

Strictures were considered traumatic if recognized in patients without a history of trauma, inflammation, instrumentation, or surgery. We identified 7 patients with congenital strictures: the bulbous urethra was involved in 4 and the membranous urethra in 3. Four of the 7 congenital strictures were discovered before 1 year of age (2 in the neonatal period). Of these, 2 were initially managed at our hospital and 2 were unsuccessfully operated upon elsewhere. No congenital stricture had the endoscopic appearance of a urethral valve.

The stricture was located in the anterior urethra in 67 patients: 57 in the penile urethra and 10 in the bulbous urethra. Posterior urethral strictures occurred in 11 cases; in all but 1 (prostatic urethra) the membranous urethra was affected. Micturition cystourethrography (MCUG), uroflowmetry, and cystoscopy, either alone or combined, were used to establish or confirm the diagnosis.
Balloon dilations were performed under fluoroscopic control. A guidewire was inserted through the urethral lumen, followed by passage of the balloon catheter over the guidewire. Contrast medium was then injected for fluoroscopic determination of the exact location of the stricture, which was visible as an indentation along the circumference of the balloon. Radial dilation was performed by expanding the inflated balloon. A urethral catheter was usually left in place for 24 h and the patient was discharged the following day (Figs. 1 and 2).

A total of 22 patients were treated by one-stage urethroplasty, which was performed as a primary procedure in 10 while the remaining 12 underwent surgical repair after failed dilation. The treatment of choice in the 10 patients with short strictures was excision followed by end-to-end anastomosis (Fig. 3).

A long stricture was identified in 12 patients. Of these, 6 were managed by a free graft using the inner surface of the prepuce or a vascularized cutaneous perineal patch with the purpose of enlarging the strictured area after longitudinal urethrotomy. The remaining 6 had long, tight strictures, all of which were managed by a vascularized tube of perineal skin, aiming to circumferentially substitute the entire strictured area.

In the surgical group, 6 patients had posterior (membranous tract in 5, prostatic tract in 1) and 16 anterior strictures (penile tract in 11, bulbous tract in 5).