THE PLACE OF ENDOSCOPIC URETHROTOMY IN THE MANAGEMENT OF URETHRAL STRICTURE

Pages with reference to book, From 99 To 102

J.P. Mitchell (Dept. of Surgery, Bristol Royal Infirmary, Bristol BS2 8HW, U.K.)

Stricture of the urethra is probably one of the oldest problems for which man has attempted to find a remedy. Dilatation by a variety of extremely crude instruments is known to have been practised in Egypt three to four thousand years ago, in Persia 1,400 years ago, and more recently by Ambroise Pare in Paris in the 16th century. Endoscopy of stricture was possible over a hundred years ago with some of the earliest forms of endoscope, using external illumination. No telescopic lens system was required to obtain an adequate view for a diagnosis with instruments such as Bozzini's lichtleiter. Even before the turn of the century a telescope had been introduced and by the early twenties excellent illustrations drawn from the view down the optical telescope were available.

With the early telescopes it was difficult to construct an end-viewing instrument owing to the need for a bulb to illuminate the view and, as a compromise, a 30° telescope was used with an offset view. Unfortunately, this meant advancing the instrument in a different direction from the line of view, which occasionally resulted in unnecessary trauma to the urethral mucosa (Fig. 1).

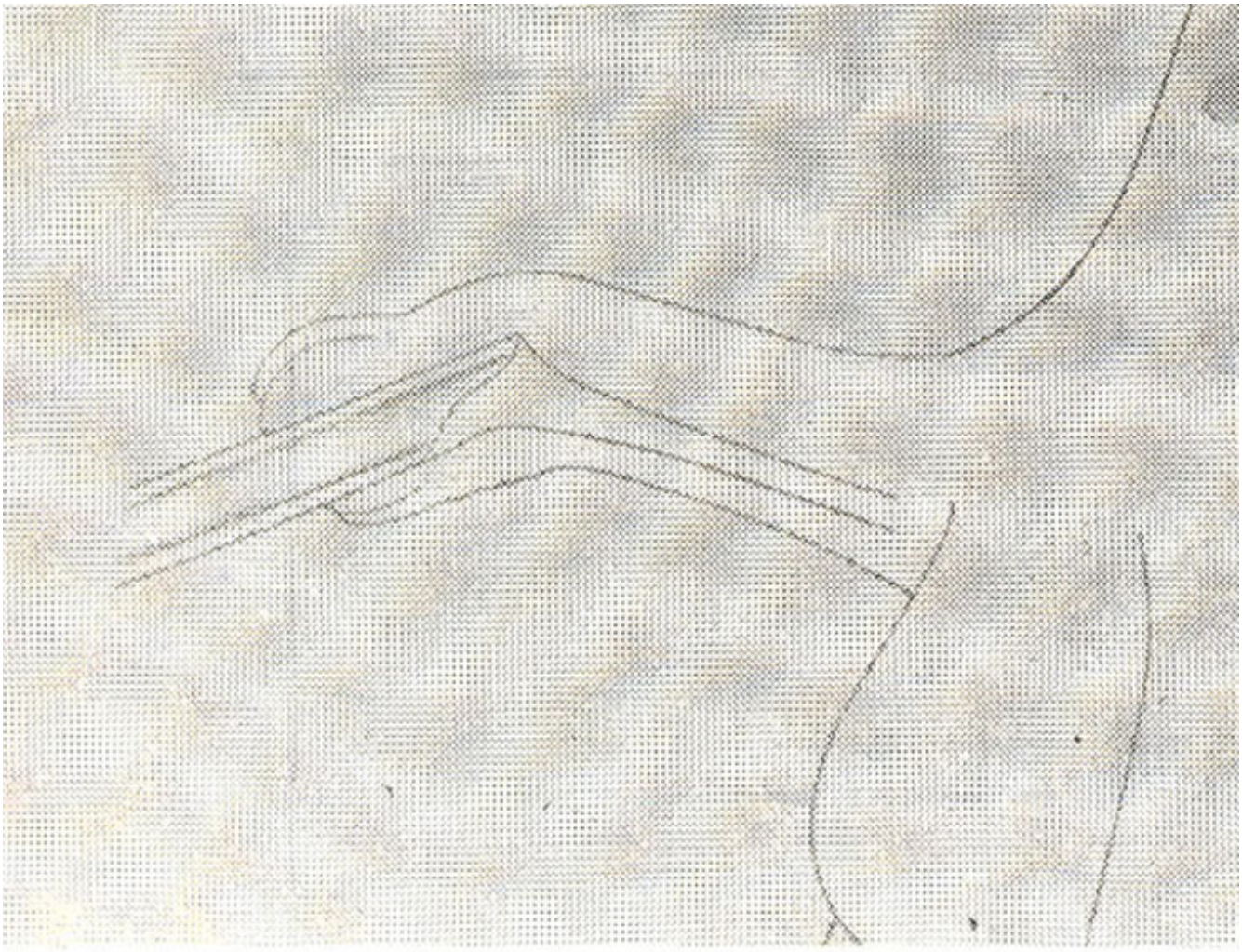

Fig. 1: As the view down the endoscope is 30° off the straight, the instrument has to be advanced in a different direction from the line of view, consequently there is a risk of damage to the urethral mucosa.

Just over ten years ago fibre illumination was introduced and this enabled us to dispense with the terminal bulb and a direct viewing instrument was extremely easy to construct. Urethroscopy became a much more frequent procedure. In fact, today the trainee urologist is encouraged to introduce an endoscope under direct vision, rather than passing the endoscope sheath with the obturator in position so that the first instrumentation of the urethra was negotiated blindly.

In the anterior urethra, the operation of urethroplasty is relatively successful, but in the posterior urethra several problems arise. Even though we may overcome the difficulties of further stenosis occurring at the mucocutaneous junction, hair tends to grow on the implanted skin. Electrocautery destruction of the hair follicles is an impossible procedure in the very hirsute man. Hairballs will form and, in Bristol the incidence is somewhere in the region of three to four per cent (Fig. 2).

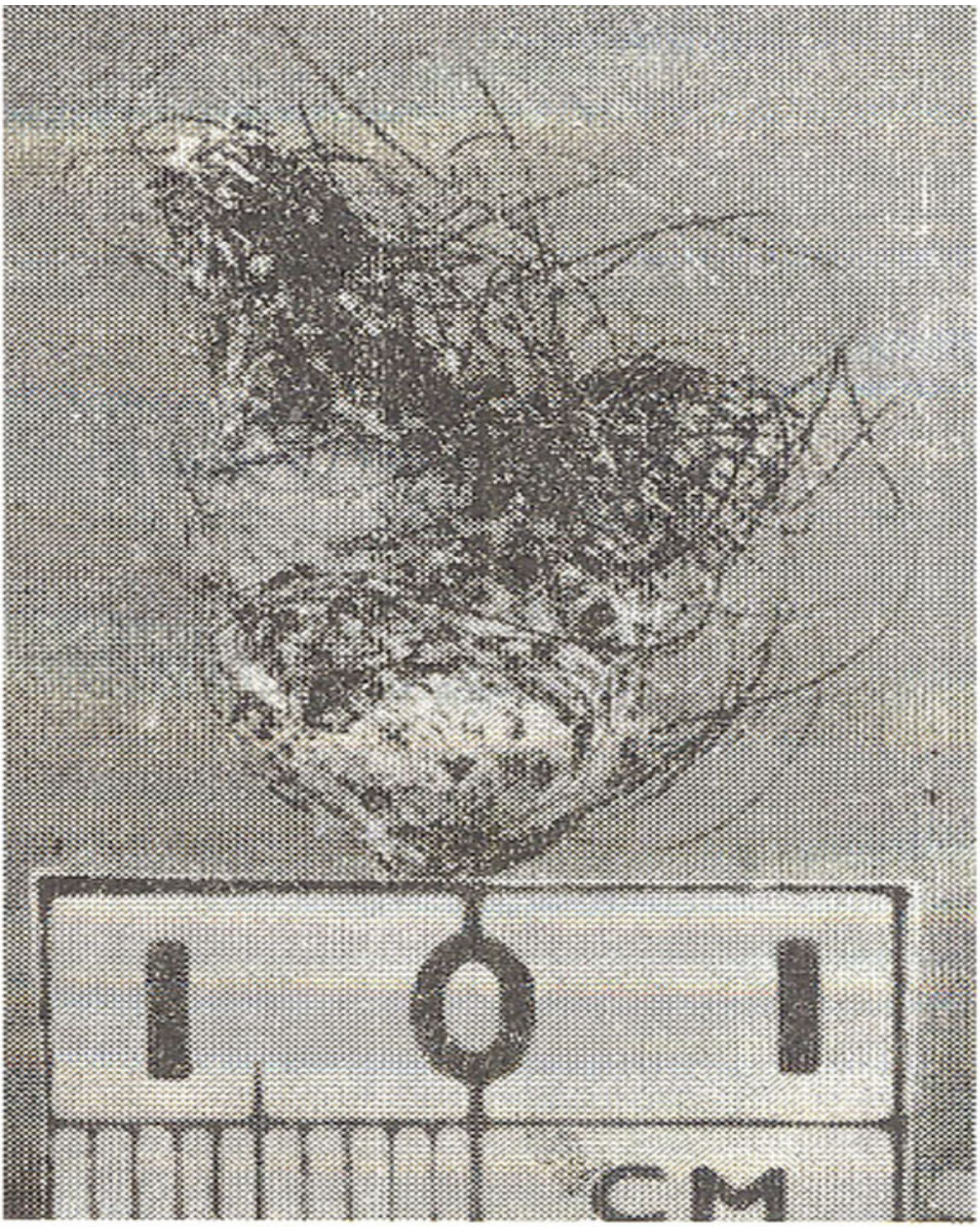

Fig. 2: Hairball which developed in the urethra, following urethroplasty with the implant of hair-bearing skin.

These hairballs then go on to develop encrustation, as does any foreign body in the urethra, ultimately forming a complete stone. Even in children, who are treated for hypospadias by an extensive skin implant, hair can grow if the skin is taken from the scrotum or perineum. It is an extraordinary fact that a child of 7 or 8 years of age, with nothing more than the finest down hair in the pubic area, can grow

hairs 3 to 4 cm long when this skin is used for a urethral implant.
Dilatation of the implanted skin segments is a further problem that has arisen following urethroplasty. This may occasionally be an advantage in that the hair bearing part of the implant can be subsequently diathermised without the risk of causing a further stricture. On occasions when the implanted area has dilated considerably, resection of the implanted skin area has been carried out with success.
Finally, infolding of the skin implant to form a bridge across the urethra has been reported by all surgeons who have been practising urethroplasty for any length of time. Only a long period of an indwelling catheter following the operation can stop the suture lines uniting across the lumen of the urethra.
With all these problems of urethroplasty, the advent of the direct vision telescope providing an excellent view of the stricture, made it immediately tempting to dilate the stricture under direct vision. In Bristol 12 years ago, using an instrument with a beak which could probe its way through the stricture (Fig. 3),

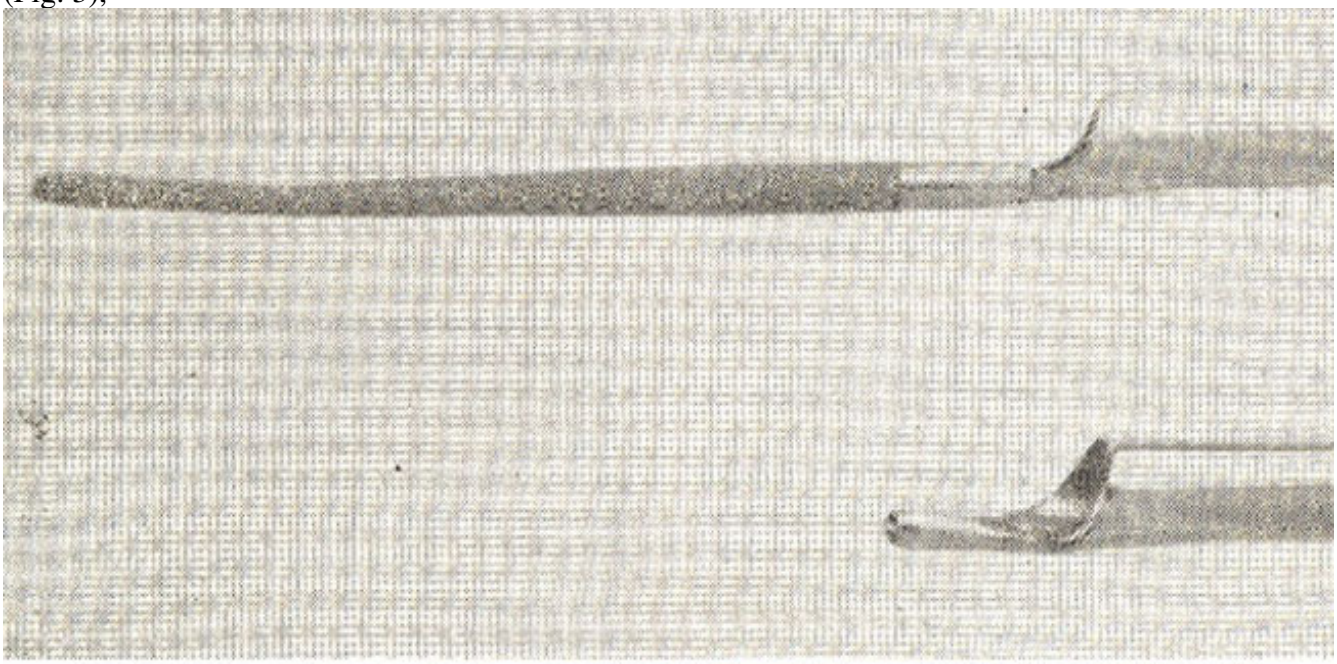

Fig. 3: Probe-pointed endoscope used for dilating strictures under direct endoscopic vision. The lower picture shows the probe replaced by a short filiform bugie.

the results of urethral dilatation immediately improved. The types of beak used were either a rigid short beak or a beak with a filiform tip. The results were so encouraging that the beak was replaced with a small blade and the overall size of the instrument was reduced to 17 Char-riere so that irrigating fluid would flow back easily between the urethral wall and the instrument, in those patients in whom the stricture was so tight that no flow could be encouraged through the stricture itself.
Cutting a urethral stricture with a rigid urethrotome gave a much cleaner lumen, than splitting the stricture with dilators. The urethrotome, constructed to a size of 17 Charriere for adults, takes the standard direct vision 4 mm telescope. For children a similar rigid urethrotome has been constructed (Fig. 5) at a size of 10 Charriere with a blade that has a back cutting edge specially designed for cutting urethral valves. The telescope used for the children's instrument is 8 Charriere (2 mm diameter). This child's instrument has been used in five children who have had severe strictures of the posterior urethra following traumatic rupture.
Subsequently various direct vision urethrotomes have been designed and constructed by Wolf, Storz and A.C.M.I. All of these urethrotomes incorporate a moving blade which can be retracted within the sheath while the instrument is passed up to the face of the stricture, and then the blade is extruded to

cut the stricture until it is open sufficiently for the sheath of the instrument to pass. As a result of using a moving mechanism to protrude the blade, the instrument has, of necessity, to be larger in size, either 22 or 24 Charriere. The blades can be changed when blunt but in all these instruments the blade is built onto such a small shaft that it does tend to be a little unstable. The advantage of the rigid urethrotome is, first that the instrument is only 17 Charriere in size and secondly the blade is completely stable and the pressure applied to cut the stricture can be felt exactly as the instrument is tilted. In this rigid urethro-

At first the blade was protected (Fig. 4),

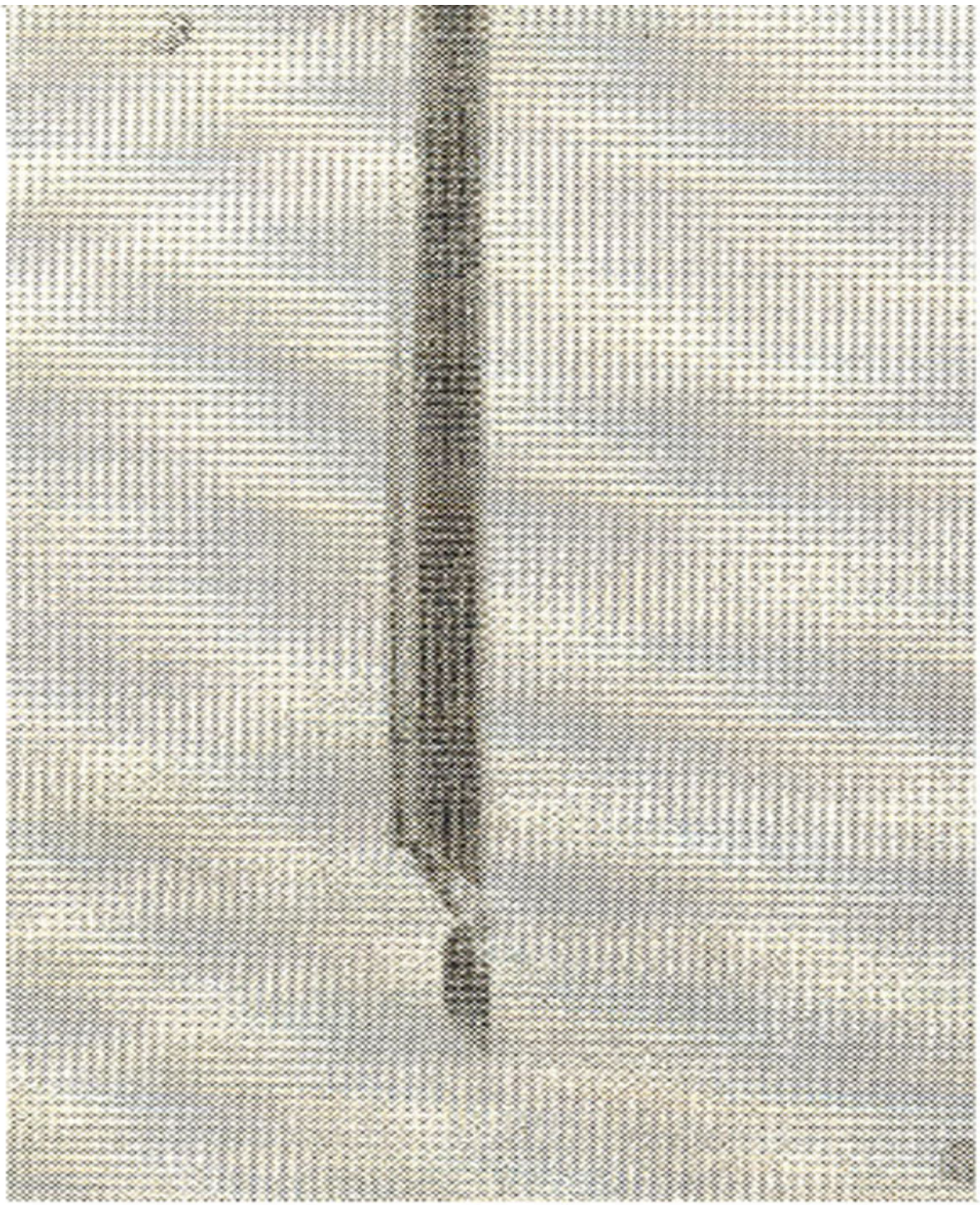

Fig. 4: The ultimate development of the rigid urethrotome, 17 Charriere in size and with the blade brought to the end of the beak.

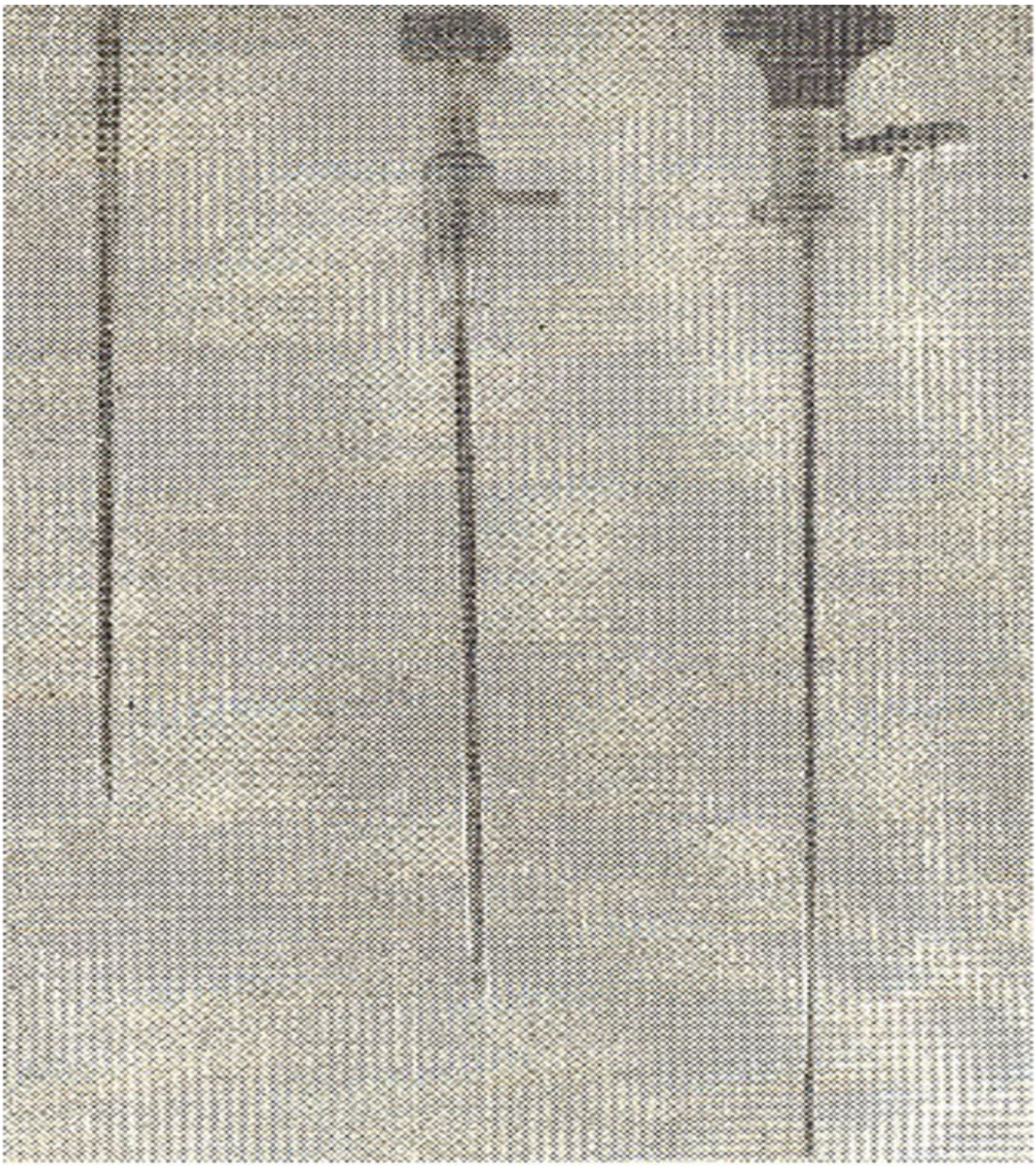

Fig. 5: The paediatric urethrotome, 10 Charriere in size.

but it was subsequently appreciated that the instrument could be introduced perfectly safely under direct vision without any mucosal damage, the urethra being fully distended with water so that the knife could be extended to the tip of the beak of the instrument. tome changing the blade is simply a matter of unscrewing the steel tube with the blade fitted and the cost is very little different from the

cost of a new blade on the retractable type of urethrotome. The greatest advantage, of course, is the small size of urethrotome both for the adult and for the child.

The original claims for success with the urethrotome are, however, somewhat exaggerated. At first it was thought that a stricture only needed to be cut once and it would not recur. However, in practice, it has been found that there is always a longer time interval between each urethrotomy. The stricture needs reviewing, first of all at eight weeks, then at twelve and subsequently increasing the time interval by one or two months.

The technique of cutting the stricture is conventionally to cut at 12 o'clock. On the other hand, lower down the urethra this would inevitably mean a risk of entering the corpora cavernosa and could result in a possible chordee. Consequently there is a school of thought that suggests the cutting should be at 6 o'clock. This is, however, very much a matter of choice and a matter to be dictated by the shape and the site of the stricture. Following traumatic rupture of the urethra in association with a fractured pelvis, there is usually an S-shaped deformity of the urethra (Fig. 6)

Fig. 6: S-shaped deformity of the urethra following traumatic rupture associated with a fractured pelvis.

and, in these circumstances, it is an advantage to cut the lower part of the S-bend at 6 o'clock, while the upper part is cut at 12 o'clock, thus ultimately with successive urethrotomies the S deformity is partially obliterated.

The original successes claimed with endoscopic urethrotomy were due to inadequate follow-up. It is

essential that a stricture is followed for a minimum of three years and possibly even for ten years before complete cure can be justifiably claimed.

After cutting the stricture the urine must be diverted from the stricture face, otherwise extravasation may occur into the tissues of the urethral wall. This diversion may be either a suprapubic stab cystotomy or by an indwelling urethral catheter of inert material such as silicone. It is advisable to use a pure silicone catheter rather than a silicone coated catheter, as phosphatic can close the lumen of the silicone coated catheter as quickly as an ordinary latex catheter. On the other hand, it could be suggested that simple dilatation would produce better results if a silicone catheter was left indwelling for seven days after the dilatation. Certainly if the indwelling catheter is omitted following urethrotomy, most patients will complain of pain on micturition, sometimes very intense and the stricture will close even more rapidly, presumably due to this extravasation of urine into the tissues of the urethral wall.

The most valuable use of endoscopic urethrotomy has proved to be in those cases of stricture due to trauma, or in patients who have had a failed urethroplasty. The management of a stricture of the urethra in a young child has always been a major surgical problem, fraught with considerable anxiety for the surgeon, to say nothing of the apprehension of both the child and its parents.

In no case yet has the interval between urethrotomy reduced in time or remained static. On one occasion a patient was readmitted to Hospital 24 hours after urethrotomy with urethral bleeding. On two occasions the cut was unnecessarily deep, the line of the stricture having been missed as the stricture was long, but there was no serious after effect. No patient has returned with the complaint of incontinence produced by or following the urethrotomy, though some patients had poor urinary control before the urethrotomy was started.

In summary, it is fair assessment to say that endoscopic urethrotomy has provided a considerable improvement in the management of urethral strictures, particularly for the shorter stricture and especially for the post-traumatic stricture. The original claims that one cut was all that was necessary, were of course a piece of over enthusiasm. Nevertheless, the results of the last ten years have been so encouraging that endoscopic urethrotomy is now the first line of treatment and urethroplasty is only considered if urethrotomy fails to give a lasting result.