INJURIES TO THE URETHRA*

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It is not my intention to go into all the details regarding how injuries of the urethra can be sustained and treated, because these details can be found in most text-books of surgery. Suffice it to say that, apart from injuries caused by some mishap during instrumentation (and this can happen to the best and most careful surgeon who has the misfortune to handle a difficult stricture at the bulb or bladder neck), most injuries of the posterior urethra are caused by fractures of the pelvis, and those of the anterior urethra by some fall on a sharp or cornered object, which imprisons the penis between the pubis and the object.

SPLINTING OF THE URETHRA

In the typical case the patient with a fractured pelvis and torn upper urethra desires to pass urine, but cannot. On catheterization a little blood-stained urine, lying in the retropubic space, might be drawn off, and if a radio-opaque material is injected through the catheter (e.g. uriodone) it will be found on X-ray examination not to be filling the bladder, but to be diffusely and irregularly spread in the pelvis.

The case is an emergency, and, if the patient will stand the operation, his pelvis must be explored as soon as possible and the bladder opened through an extraperitoneal approach. A thin Foley's catheter e.g. size 16F, is passed up the urethra, its end grasped in the retropubic space and pulled out over the symphysis pubis. A Jacques catheter is passed through the bladder down the prostatic urethra, its point is also grasped in the retropubic space and likewise pulled out from underneath the symphysis pubis (Fig. 1). A thick 18 inch length of dermalon on a needle is stitched to the point of the lower Foley's catheter, pushed through the lower eye of the catheter, and firmly tied round the catheter. The other end of the dermalon is tied round the Jacques catheter, pulled up into the bladder, cut off the catheter, threaded on a long needle which carries it through the bladder and abdominal walls, and the dermalon end is now secured to a button to prevent it from being accidentally pulled down and out.

The Foley's bag is now blown up and, by pulling on the catheter from below, the prostatic urethra is approximated

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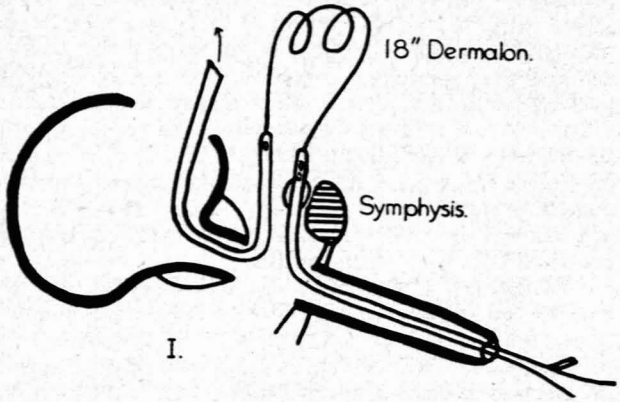
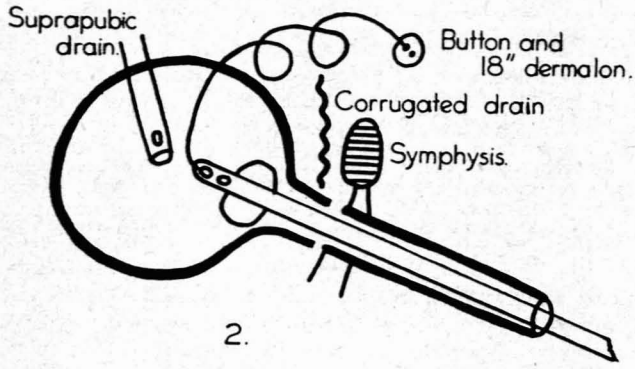
to the membranous urethra (Fig. 2). Should the bulb burst and the catheter come out (an accident which has happened to me on several occasions) the very sick patient need not be taken back to the theatre to re-insert the catheters by re-opening the abdomen, but the catheter is pulled out until the dermalon presents at the external meatus, it is cut off from the catheter and stitched into a new catheter, which is then easily pulled up into the bladder by pulling on the dermalon on the abdominal wall. The bladder is closed round a tube and the retropubic space drained with a corrugated rubber. The fractured pelvis is treated by an orthopaedic surgeon if one is available, shock is combated and antibiotics prescribed.





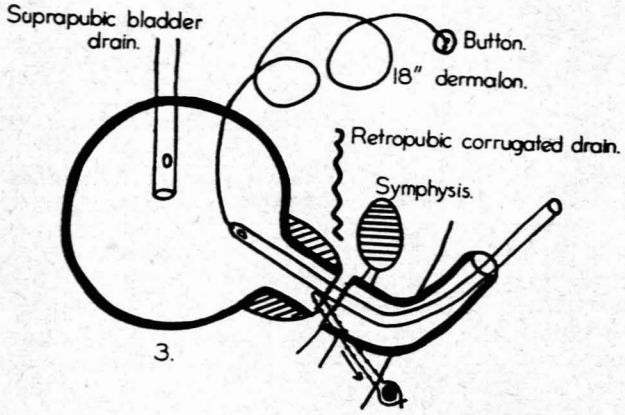


Fig. 1. Catheters passed from above and below with dermalon tied to their eye ends. The lower catheter can now be pulled up into the bladder across the defect in the posterior urethra.

Fig. 2. Foley's bag blown up, catheter pulled on to approximate torn ends of urethra. 'Safety' dermalon thread lies curled up on abdomen.

Fig. 3. Catheter again anchored by means of a transfixing dermalon stitch curled up on the abdomen plus a dermalon stitch through the apex of the prostate, coming out on the perineum and there tied over a rubber tube. The ruptured ends of the urethra can, therefore, be approximated easily, but firmly and accurately.

The posterior urethra will tolerate such splinting without stricture formation and the catheter can be kept in position for a few weeks. After removal of such a catheter and waiting for a week or two before negotiating the healed or healing urethra, one always feels a bit anxious about whether in fact the join will be found to be negotiable.

The following steps are now followed after the urethra has been splinted for 2-3 weeks:

1. The retropubic drain and bladder drain have been removed during the first week or 10 days so that by now there is no suprapubic leakage. The dermalon thread comes through a small fistula, but no leakage takes place past it.
2. The Foley's catheter, with dermalon attached, is pulled out below, the dermalon cut loose from it, and its upper and lower ends are tied loosely over the pubis, the patient passing urine past it without discomfort.
3. At weekly intervals, catheters are passed up the urethra alongside the dermalon. If tortuosity or stricture formation prevents this, the dermalon ring is cut, the end threaded through the tip of the catheter, tied, and by joint pushing and pulling, the catheter is easily advanced into the bladder and the stricture dilated. A fresh and longer piece of dermalon can at any time be tied to the old piece, pulled through, and made to replace the previous length.
4. Only when the ruptured urethra is well healed and consolidated and when catheters and sounds pass with ease and without fear of disrupting the uniting area, is the dermalon cut and removed.

RUPTURED URETHRA IN BOYS

The above scheme works well in an adult with a big urethra, but when one is treating small boys, one finds that the urethra is so thin that it will not take a Foley's catheter, and, with no bulb to pull the upper urethra down to the membranous urethra, one finds a gap in the urethra retropubically, through which up to $\frac{1}{2}$ inch of the bare catheter can sometimes be seen. If one depends on a fibrous tissue scaffolding and epithelization of it, one must of necessity get a tortuous troublesome stricture, requiring repeated difficult dilatations for years under general anaesthesia. Children are usually not brought for regular treatment, but come back when the stricture is already impassable, even by a filiform catheter. Under these circumstances the suprapubic approach has to be repeated, to relieve a full bladder full of sepsis and sometimes full of stones or gravel.

The ideal method in all these urethral ruptures would be to do end-to-end suturing, and some urologists do this. But this is not always an easy procedure; it entails a difficult perineal approach through a vascular area, into very much traumatized and bleeding tissues where stitches tend to pull out, and in addition the patient is often badly shocked from his fractured pelvis and/or accompanying injuries.

A simple yet most efficient way of handling such a rupture in a small boy is the following:

1. Thread a catheter through the distal urethra and then up into the bladder by the same manoeuvres as already outlined (Fig. 1).
2. Leave a long piece of dermalon on the abdomen for the same purpose as described for adults, i.e. to enable one to guide new catheters and dilators back into the bladder.
3. Transfix the apex or distal torn end of the prostate with

dermalon stitches, one on either side of the catheter, pass the two ends of the stitch on the right side through the eye of a long curved skin needle and with this transfix the perineum, entering just to the side of the membranous urethra. Tie the two ends of dermalon over a piece of rubber tubing on the perineum, in this way approximating the urethral ends. Repeat this procedure on the left side (Fig. 3). After about a fortnight the dermalon threads are cut in the perineum and removed.

The catheter is kept in longer, and the manoeuvre of pulling the dermalon, which is tied to its end, down the urethra, etc., is also carried out here.

In the last case of a child that I treated in this way, a boy of 4 years, the result was excellent; no dilatations were necessary, evacuating urethrograms showed a straight posterior urethra and the stream was excellent. I intend adopting this manoeuvre in future also in the adult urethra, in addition to the Foley's catheterization.

I can recommend these manoeuvres not only for their simplicity of execution, but also for the gratifying results.

The diagrams were prepared and photographed by Mr. McManus, by kind permission of Prof. J. H. Louw, Department of Surgery, University of Cape Town.