Retrograde Ureterorenoscopy in the Management of Ureteral Calculi

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Endourologic techniques have revolutionized the line of treatment of ureteral stones. The scope of open ureterolithotomy has been narrowed and the contraindications for endoscopic manipulations of ureteric stones became limited.

Using the rigid ureterorenoscope (URS) after endoscopic dilatation of the intramural ureter, we have manipulated 45 ureteral stones located at different levels, 33 in the lower ureter (distal ureter), 7 in the middle third and 5 in the upper third (proximal ureter).

Successful manipulations occurred in 32 stones (in 21 by retrieval and in 11 by disintegration using ultrasonic lithotripsy).

Failures were due to upward dislodgement of the stone in 5 cases, to grasp or disintegrate the stone in 2, perforation of the ureter in 2, bleeding from the ureteral wall in 2 cases, to reintroduce guidewire in the ureter and to non-passable stricture below the stone in 1 case each.

Delayed complications occurred in 4 patients. Two patients developed ureteral stricture, one suffered vesicoureteral reflux and one ultimately had urethral stricture.

Introduction

Ureteroscopy, initially an art handled exclusively by experienced endourologists, is now being undertaken routinely by nearly all urologists. With the advent of rigid and flexible ureteroscopes, rigid and flexible grasping forceps, new stone baskets and various types of lithotripsy, the indications and ways to use ureteroscopy have expanded [11].

Endoscopic examination of the ureter was first performed earlier in this century, but it was not until the early 1980s that Perez-Castro Ellendt and Martinez Pineiro developed the first clinically useful rigid ureteroscope. Since then, the rigid ureteroscope has undergone several technological improvements, principally a reduction in diameter and improvement in optics. In addition, lithotripsy by ultrasonic and electrohydraulic technology was adopted for removal of large calculi through the smaller endoscopes. Laser lithotripsy has also been evolved. As a result of these improvements ureteroscopy has become the primary method of treating patients with ureteral calculi [3, 4, 6].
Material and methods

Ureteroscopy was done for 45 ureteral stones selected from outpatient clinics and private cases in El-Demerdash University Hospital, Dar El-Shefa Hospital and Ain Shams University Specialized Hospital for management of ureteral stones at different levels of the ureter.

The 45 ureteral calculi were present in 38 patients (25 males and 13 females aged 18 to 53 years). The size of calculi ranged between 5 and 25 mm.

Table 1 shows the different levels of location of ureteral stones.

<table>
<thead>
<tr>
<th>Site of stone</th>
<th>No. of stones</th>
<th>Per cent</th>
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</thead>
<tbody>
<tr>
<td>Lower third (distal ureter)</td>
<td>33</td>
<td>75.1</td>
</tr>
<tr>
<td>Middle third</td>
<td>7</td>
<td>15.5</td>
</tr>
<tr>
<td>Upper third (proximal ureter)</td>
<td>5</td>
<td>9.4</td>
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</table>

Endoscopic technique

A preoperative plain film of the abdomen should be done before starting endoscopy to confirm the presence and location of ureteral calculus. Epidural, spinal or general anaesthesia can be used. The patient is placed in the lithotomy position with the contralateral leg hyperflexed to facilitate introduction and manipulation of the ureteroscope [4]. Cystourethroscopy is performed by 21 F sheath. A floppy tip straight guidewire is introduced through the cystoscope and then through the ureteral orifice under vision and up the ureter past the calculus under fluoroscopic control. Dilatation of the intramural ureter (ureterovesical junction) can be done by one of the following methods:

- Passage of the serial semirigid ureteral dilators (6 F through 18 F) over the guidewire.
- Passage of the serial olive tip metal dilators (9 F through 15 F) over the guidewire.
- Hydrostatic balloon dilatation of the lower ureter (the preferred method).

The balloon catheter dilator (Van tec or Cook) is advanced over the guidewire through the cystoscope and passed into the intramural portion of the ureter. Under direct vision, the balloon is inflated to dilate the intramural ureter and the ureteral orifice. Hydrostatic dilatation is maintained for 5 minutes. The balloon is deflated and withdrawn with the cystoscope, leaving the guidewire in place. Fluoroscopic confirmation of the position of the guidewire in the renal pelvis is again obtained [2, 4, 9].