Technique to facilitate treatment of urethral strictures

Title: A simple technique to facilitate treatment of urethral strictures with optical internal urethrotomy

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Introduction

An urethral stricture is a narrowing of a section of the urethra. It causes a blocked or reduced flow of urine which can result in a range of manifestations, from asymptomatic to severe discomfort. Moreover, it can lead to serious complications such as urinary infections and renal insufficiency secondary to urinary retention. Blunt perineal trauma, urological instrumentation, chronic inflammatory disorders such as lichen sclerosus et atrophicus and sexually transmitted diseases are the most frequent causes of strictures; a large proportion are iatrogenic .

Currently, three different interventions are used to treat urethral strictures: dilations, optical internal urethrotomy and open urethroplasty [(1)] . Dilations are easy to perform in every day clinical practice, however they show the highest recurrence rates while their outcomes are the less satisfying to the patients. On the other hand, open urethroplasty shows the lowest recurrence rates and its outcomes are the most satisfying to the patients [(2)] . Although it is the current gold standard against which the traditional treatments are compared, this technique requires skills, expertise and equipment, often not available in the resource limited settings. For the above reasons, most patients with urethral stricture are offered optical internal urethrotomy . This procedure is preferred as the first treatment option by many urologists, as it is performed within short operative times, under either spinal, or local anaesthesia. It can be also done as an outpatient procedure for the treatment of short urethral strictures . Optical internal urethrotomy is performed by a rigid urethrotome or a flexible cystoscope/urethrotome combination. The instrument is inserted and guided to the face of the stricture and a small blade at the tip of the instrument is deployed using a trigger mechanism to cut the stricture at locations determined by the surgeon. Upon completion of the internal incision(s), the instrument is withdrawn and an appropriately sized Foley catheter is inserted through the repair and into the urinary bladder. Hospitalization lasts 2 days and the patient keeps the catheter a few days . However, technical difficulties associated with poor visualization of the stenosis or of the urethral lumen may increase procedural time and substantially increase the failure rates of internal urethrotomy.

In this report we describe a technique for urethral catheterization via a suprapubic, percutaneous approach through the urinary bladder.

Case Report

A 35-year-old male patient, presented to our urology department with a severe (> 5 cm), tortuous stricture of the penile urethra, previously diagnosed by descending cystourethrogram (Figure 1). A suprapubic catheter was in place.

Technique

The urinary bladder was filled with 300 millilitres of diluted iodinated contrast (contrast/normal saline: 1/3) via the suprapubic catheter. A 0035”, J-tip standard angiographic guidewire was inserted into the urinary bladder through the suprapubic catheter. The latter was removed and exchanged with a short (11 cm), 5-French angiographic sheath. The angiographic guidewire was subsequently withdrawn and a Cobra-1 angiographic catheter (5 Fr, 65 cm) loaded with a 0035, hydrophilic, J-tip guide-wire was inserted into the bladder. Under fluoroscopy, the catheter-guidewire combination was guided towards the internal urethral orifice and urethra was catheterized. The hydrophilic guidewire was used to negotiate the stricture and was finally advanced through the external urethral orifice (Figure 2). The angiographic catheter was subsequently advanced through the stenosis, over the guidewire (Figure 3). The hub of the catheter was cut off and the vascular sheath was removed. The posterior part of the catheter is stabilized on the abdominal wall with a suture. The patient was then taken to the operating room and placed in lithotomy position, under spinal anaesthesia. By keeping

the angiographic catheter stretched, the rigid urethrotome was inserted in the urethra (Figure 4) and directed to the face of the stricture. The blade at the tip of the instrument was deployed using a trigger mechanism to cut the stricture at the 12 o clock location along the entire length of the stenosis. Upon completion of the internal incision, the instrument was withdrawn and a Foley catheter was inserted through the repaired stricture and into the urinary bladder.

Results

Antegrade catheterization of the urethral stricture and subsequent treatment of the stricture by using the angiographic catheter as a guide for the urethrotome proved feasible. No urethral injury, false passage or development of fistula were observed. The fluoroscopically guided antegrade catheterization of the stricture lasted 11 minutes. The patient remains free of recurrence 7 months post-operation.

Discussion

Internal urethrotomy has advantages of ease, simplicity, speed and short convalescence. However, success rates vary and long term results are generally low. In the short-term (less than 6 months), success rates are 70 to 80 percent. After one year, however, recurrence rates approach 50 to 60 percent and by five years, recurrence falls in the range of 74 to 86 percent [(4).] Although different studies have proposed different etiologies as poor responders to optical internal urethrotomy, technical and anatomical factors such as reduced visibility during the operation and stricture length are

uniformly recognised as predictors of recurrence . Other factors associated with treatment failure are the perioperative urinary infection, the presence of periurethral fibrosis (spongiofibrosis) and stricture etiology [(5)] .

In cases of severe urethral stenosis or excessive urethral tortuosity the actual site of the stricture may not be visible at all4. Intraprocedural bleeding, presence of blood clots, inflammatory or injured tissues add extra difficulty in localization of the stenosis and in safe advancement of the urethrotome. Retrograde instillation of methylene blue through the suprapubic catheter and/or antegrade advancement forwarding of an ureteral stent are usually used in order to visualise narrowed urethral lumen, or to guide the urethrotome through a tortuous urethra respectively. However both manoeuvres are of questionable effectiveness. In several cases the procedure is concluded in two sessions; in other cases a scar appears after urethrotomy (probably as a result of a false route of the urethrotome) and this causes a new stricture. The above may explain surgical success rates as low as 20% .

To overcome these problems, we devised a technique which is based on percutaneous, trans-cystic catheterization of the urethra. The technique requires low-cost, widely available materials of interventional radiology and a fluoroscopy unit. The procedure is brief, well-tolerated and requires no anesthesia. Our initial experience showed that even a long and severe stenosis could be negotiated with rotational and gentle probing movements of the hydrophilic guidewire. Of note, we preferred to utilize the angiographic catheter instead of the guidewire as a guide for the urethrotome; compared

to the guidewire, the angiographic catheter proved more stable, more efficient for straightening of the urethra and more easily visible endoscopically.

References

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Legends

Figure 1

Descending cystourethrogram showing severe stenosis of the penile urethra (arrow).

Figure 2

Demonstration of the technique after the replacement of the suprapubic catheter with the angiographic sheath (arrow). The angiographic catheter (dotted arrow) and the guidewire (arrowhead) have been inserted through the angiographic sheath into the bladder. The guidewire has negotiated the stenosis and has been externalized through the external urethral orifice.

Figure 3

The angiographic catheter (dotted arrow) has been advanced across the stenosis over the guidewire.

Figure 4

Endoscopic view of the angiographic catheter which served as a guide for the urethrotome.