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Urethral strictures are relatively commonly encountered in urological practice. It is essential that all trainees are aware of how to deal with a stricture when encountered to ensure that a patient has the best outcome.

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## Aetiology of Urethral Strictures

Strictures were commonly caused by urethral infection but this has now become uncommon (less than 1%). Infection has been supplanted by iatrogenic causes such as endoscopic surgery, catheterization and hypospadias repair and pelvic fracture injuries, external trauma and lichen sclerosis [1–3].

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## Presentation

A patient will usually present with urinary symptoms of voiding dysfunction with hesitancy, a poor stream and straining. A primary urinary tract infection may be the presenting feature of a urethral stricture. Straining is not usually a symptom associated with prostatic outflow obstruction but more commonly with a stricture or a poorly contractile bladder. A patient may present in retention of urine but this is less common. If a patient has symptoms of bladder outflow obstruction then much depends upon the patient's age and the background history as to whether or not there has been instrumentation. In a younger patient if he presents with voiding

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difficulty then a stricture should be at the top of the list of differential diagnoses. This affects how the investigation of voiding dysfunction is performed.

Having taken a history the patient should be examined for a palpable bladder and a prostate examination to assess prostate size and consistency.

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## Investigation

A primary free flow rate and scan should be performed in all cases. A urine culture should be obtained.

The classical stricture flow rate usually has a square pattern. If this is encountered in any patient then a stricture should be at the top of the list of differential diagnoses.

## Urethrogram Versus a Cystoscopy

The question is what is the most appropriate way to diagnose a stricture? Is it by a flexible cystoscopy under local anesthesia or by ascending urethrography?

The author's opinion is that it is more logical to perform an ascending urethrogram to confirm the stricture, its position and length than to perform a flexible cystoscopy. Although a stricture will be seen at a flexible cystoscopy one does not know how long, how tight and where the stricture is. After diagnosis the patient would need to come back for further investigation and likely endoscopic treatment. A urethrogram can more easily generate a diagnosis and provide a means of discussing appropriate treatment.



The most effective long-term treatment of strictures is an urethroplasty but as up to 65% of strictures will be resolved by endoscopic measures it is certainly worth treating any stricture with an endoscopic procedure.

## Endoscopic Surgery of Strictures

In order to manage a stricture very much depends upon its site, its length, the age of the patient, the aetiology and whether or not there may be associated bladder out-flow obstruction caused by prostatic enlargement.

It is important that any patient even if elderly, who has prostatic obstruction but also has a stricture that the stricture should be treated first and separate from any prostatic obstruction. The stricture may be the primary cause of the voiding dysfunction and not prostatic enlargement.

### What Should Be Used to Perform a Cystoscopy and Treatment of a Stricture?

The ideal instrument is an optical urethrotome, the Sachse instrument. This has a small blade with a trigger mechanism, which allows the stricture to be cut. It also has a guide channel to allow placement of a guide wire.

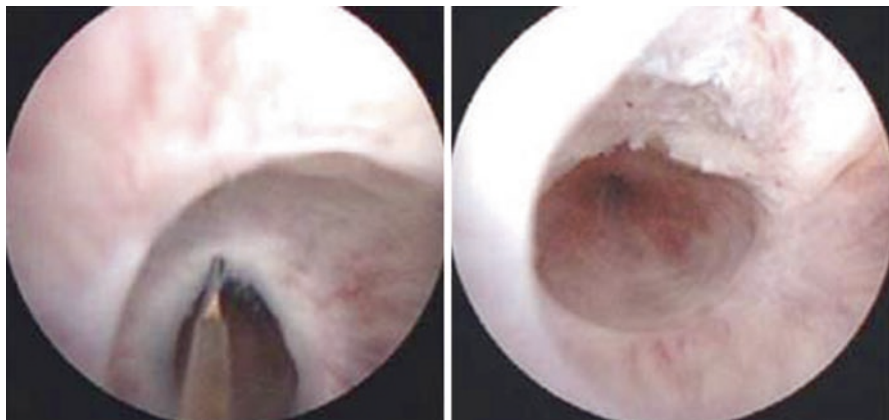


For the experienced surgeon it may not always be necessary to pass a guide wire but for the less experienced surgeon passing a guide wire through the stricture will very much aid the division of a stricture with the urethrotome.

### Should the Urethra Be Cut at 6 or 12 o'Clock?

This very much depends upon whether or not it is suspected that urethroplasty is to be likely.

If an urethroplasty is to be performed this usually involves placing a graft at the 12 o'clock position. It is thus logical to divide the urethra at the 12 o'clock position. Thus if scarring does occur this can be excised at the time of a future urethroplasty if necessary.

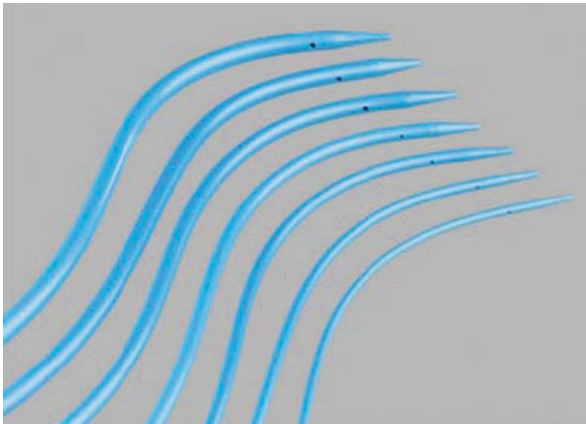


Gently teasing the urethra open with the urethrotome with a guide wire to provide a vision of the continuity of the urethra is the most effective way of dealing with a stricture below the membranous urethra. If the grooved catheter guide is placed on the optical urethrotome at the outset then once the stricture has been divided and the endoscope has reached the bladder a catheter can be placed within the guide into the bladder without any difficulty. Plenty of lubrication should be used to ensure that the catheter slides easily into the bladder. The grooved guide will accommodate a 16 French silicone catheter.

Strictures of the urethra can be blindly dilated but this very much depends upon the experience of the surgeon. A blind urethral dilatation using Cluttons sounds is not recommended for an inexperienced surgeon. There is the danger of causing a urethral injury and a false passage. If a stricture is short or relatively rigid and cannot easily be negotiated then blind dilatation can be undertaken but only with experience.



The other alternative is to use Cooke's dilators which are S shaped and can be passed over a guide wire once that guide wire has been passed into the bladder.



The alternative technique is to use Amplatz dilators over a guide wire [4].

## Placing a Catheter into the Bladder

A catheter should be placed into the bladder after urethrotomy or dilatation. The catheter should be placed using the grooved guide which comes with the urethrotome or a guide wire.

If there are difficulties placing a catheter into the bladder then the safest way of achieving this is to use a catheter placed over a guide wire.

The guide wire should be placed into the bladder using direct endoscopic vision.

Using a large venflon cannula a hole is made in the tip of the catheter using the eye of the catheter to allow entry of the cannula. The guide wire is then passed through the tip of the catheter and pulled out through the eye of the catheter. The guide wire can then be fed down the catheter and using plenty of lubrication both inside and outside the catheter the catheter can be slid up into the bladder over the guide wire. The guide wire can then be removed.

## Impassable Strictures

For impassible strictures in which an urethroplasty is not indicated such as the patient with a long-term suprapubic catheter or someone who is elderly or unfit where urethral access is necessary then a rendezvous procedure through an existing suprapubic tract can be used. A flexible endoscope passed through the suprapubic tract down into the urethra can shine light into the urethra, which can then be accessed from below using that light as a guide. This again should only be used where there is an experienced surgeon present.

## **Duration of Catheterisation**

Once the stricture has been treated and a successful channel created the question is whether or not a catheter should be left in situ and for how long? [5]

There is no real merit in placing catheters for a long period of time. A catheter can be left in situ for 24–48 h and then removed. Then longer the duration of catheterization the more the stricture is likely to recur. The only indication for a longer period of catheterization is the creation of a false passage or extravasation.

## **Self-Dilatation by Intermittent Catheterization**

The question is whether or not the patient should be started onto intermittent self dilatation. Some patients do not wish to do this.

If the patient is able and willing to do self catheterisation then this should be used on a daily basis for 6 week and then weekly for 6 months. This is thought to stabilize the stricture open. The question is always when to stop the self dilatation? The assumption being that once the self dilatation is stopped and there is a mature scar present that re-stricturing will not occur. This can only be judged by treating the individual patient. However there is evidence that self-dilatation does not appear to affect the success primary treatment [6].

## **What to Do After Stricture Recurrence?**

If the stricture recurs then the question is whether or not the patient should be appropriately treated by an urethroplasty. For the elderly and unfit patient it will be preferable to continue with further dilatation rather than undergoing an urethroplasty with poor results. For the younger patient if a single dilatation/urethrotomy fails then an urethroplasty is the treatment of choice with the best long-term outcomes.

## **The Sphincter Stricture**

For a patient who has had a prostatectomy and has developed a sphincter stricture this is best treated by dilatation rather than urethrotomy since a urethrotomy may impair sphincter function and lead to incontinence of urine. This can be achieved using Cluttons dilators or by using Cooke's dilators with a guide wire if there is difficulty accessing the bladder. For the stricture that is short and tight but accessible with blind dilatation this can be successfully used in experienced hands.

## **Bladder Neck Strictures**

These are more common in the current era because of the use of radical prostatectomy for prostate cancer. These can be treated by urethral dilatation and then by

self-dilatation or by bladder neck resection. However, there is the risk that the stricture will recur.

## Strictures and the Artificial Urinary Sphincter

If a patient has had an artificial urinary sphincter placed for incontinence of urine after a radical prostatectomy and bladder neck stenosis does develop it is important to deactivate the sphincter before any endoscopic procedures to avoid damage to the urethra within the artificial sphincter cuff.

## Complications of Endoscopic Stricture Treatment

1. Failure to negotiate a stricture
2. Urethral damage causing a false passage and extravasation
3. Bleeding

False passages sometimes cannot be avoided but can be minimized by a direct vision urethrotomy with a guide wire. Bleeding may not always be avoided. If bleeding does occur a catheter placed with compression on the urethra for 5–10 min usually should reduced the risk of postoperative bleeding. Sometimes there is a little bleeding around the catheter and it is not usually a cause for concern. If bleeding is more extensive then as described compression of the penis by either holding the penis with a gloved hand or wrapping a swab around the penis to allow the blood to clot within the urethra usually will stop that bleeding.

### Conclusion

The management of urethral strictures by endoscopic measures has a place in the modern era but does require care and experience. Predicting beforehand the likely complications that can arise will reduce the risk of those complications. The use of a guide wire and placing an endoscope over the guide wire into the bladder reduces the risk of complications of endoscopic stricture treatment [7].

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