

The Art of Urethrograms: A Role for Urologists

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Introduction

Urethrography is used in reconstructive urology to elucidate the location, length and complexity of urethral stricture disease.

Whilst Urology registrars are familiar with the concept of urethrography, few trainees are taught the art of “how to perform” a urethrogram. There are nuances in the procedural technique that significantly affect the quality and accuracy of a urethrogram.

Objectives

Identify common pitfalls and mistakes

Outline the key steps of high-quality retrograde urethrography

Highlight the role Urologists can play in performing urethrograms

Method

We retrospectively analysed a case series of urethrograms obtained for a cohort of 139 urethroplasty cases performed in Toowoomba, Queensland between January 2017 to May 2021.

This cohort encompasses a broad spectrum of urethral stricture disease in male, female and transgender patients.

Results

In our cohort of 139 urethroplasty cases, 104 cases (74.8%) had a urethrogram completed prior to surgery.

The urethrogram was performed by a Radiology department for 62 cases (59.6%), whilst a Urologist performed the urethrogram in 42 cases (40.4%). In 7 cases (6.7%) the patient had an initial urethrogram performed by Radiology and subsequently had a second urethrogram performed by Urology.

Figure 1 illustrates common pitfalls and mistakes that were encountered in this cohort of urethrograms.

Urethrogram Technique

1. Fill a 20mL syringe with 20mL of radio-opaque contrast. Attach a 21 Gauge plastic IV cannula to syringe.
2. Position the supine patient obliquely at 20-30° using a wedge pillow.
3. Perform a pre-injection scout film. In male patients, stretch out the penis to ensure visualisation of entire urethra.
4. Place end of the plastic IV cannula within meatus and use fingers to create a seal around cannula.
5. Steadily inject contrast into urethra whilst maintaining finger seal around cannula and imaging.

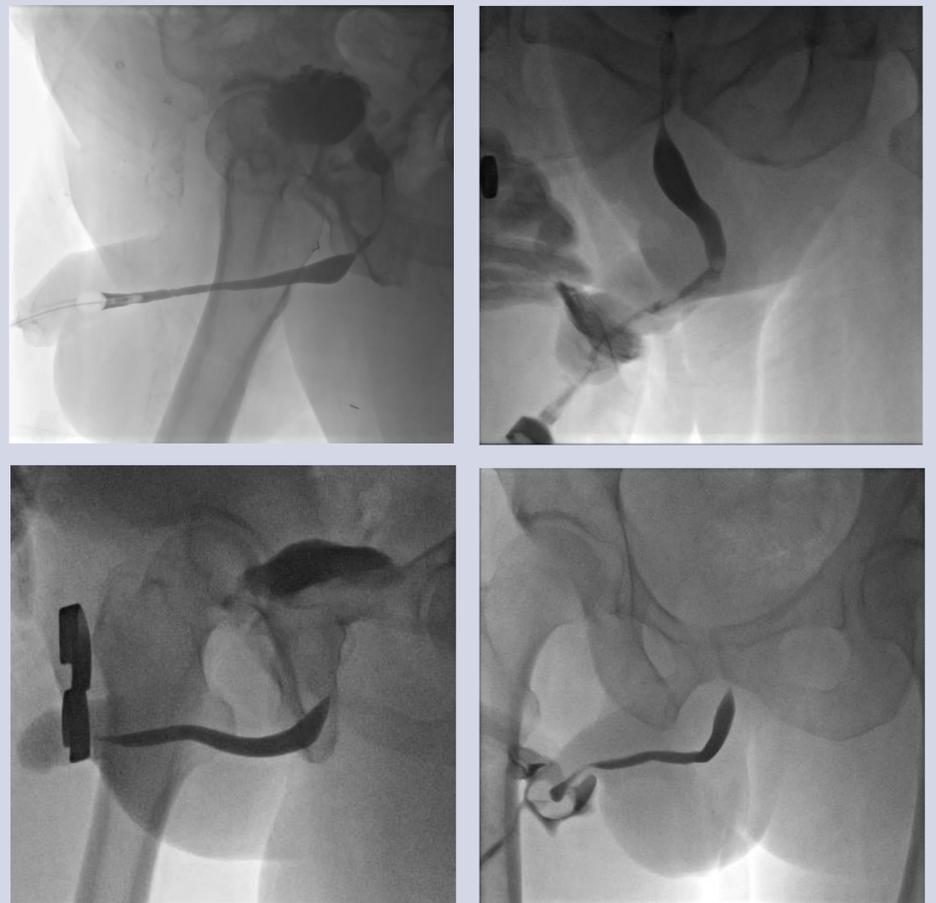


Figure 1. (A) Catheter advanced too far into urethra causes discomfort and prevents opacification of distal urethra. (B) Contrast spillage due to use of a small paediatric catheter. (C) Clamp obscures visualisation of distal urethra. (D) No contrast seen entering the bladder neck.

Case Study

A 47 year old man presented with obstructive nephropathy. He required urethral dilation to facilitate the insertion of a 14 Fr IDC. Retrograde urethrography was performed to investigate for a suspected urethral stricture.

The initial urethrogram obtained by Radiology (Figure 2.A) suggests multiple urethral strictures, but poor positioning and failure to stretch out the penis prevented precise determination of stricture location and length. The urethrogram was repeated by a Urologist with training in reconstructive urology (Figure 2.B). By placing the patient in an oblique position and stretching out the penis, the entire length of the urethra was visualised. This urethrogram clearly demonstrates the multiple ringlets of a 6cm long stricture extending from the penile to bulbar urethra

Subsequently, the Urologist used the second urethrogram to plan and perform a dorsal onlay urethroplasty using a buccal mucosal graft (Kulkarni technique).

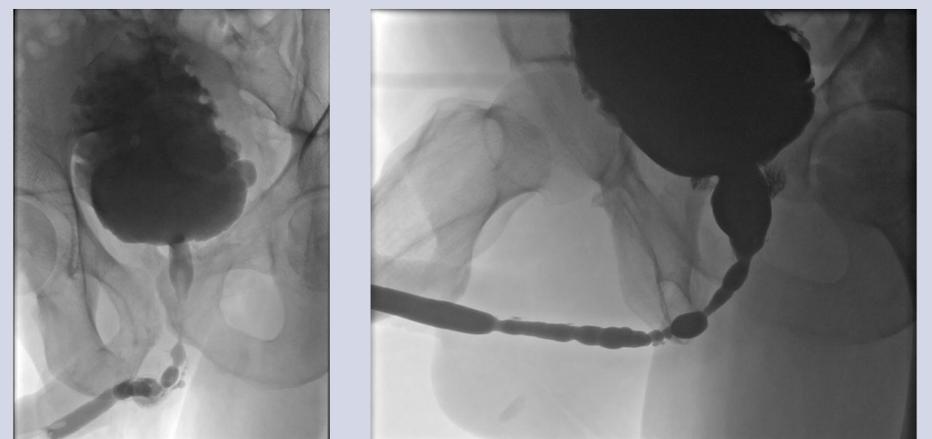


Figure 2. (A) Radiology Urethrogram – Cannot visualise entire urethra due to poor positioning and failing to stretch penis. (B) Urology Urethrogram – Penis is stretched out to reveal entire urethra.

Conclusion

- **With their intimate knowledge of urethral anatomy, Urologists are uniquely placed to perform high-quality urethrograms.**
- **Poor patient positioning impedes visualisation of the entire urethra.**
- **Contrast injection can be optimised by using the finger seal method with a plastic IV cannula.**
- **Excessive force leads to contrast extravasation that obscures subtleties of urethral anatomy.**