Radiology Techniques Department

Special Radiological Procedures-1

lecture 8

Micturating Cystourethrography

By

MR.T Hussein Ayyed

MS.c Nariman Neamah

Micturating Cystourethrography

Micturating cystourethrography (MCU) is a fluoroscopic study of the lower urinary tract in which contrast is introduced into the bladder via a catheter.

It is more commonly performed in the pediatric population *than* adults.

Indications

1. Vesicoureteric reflux

2. Study of the urethra during micturition (urethral lesion)

3. Bladder leak post-surgery or trauma

Contraindications

Acute urinary tract infection

Contrast Medium

LOCM 150 mg.

Equipment

1. **Fluoroscopy unit** with spot film device, video recorder, and tilting table

2. Bladder catheter

Patient Preparation

The patient empties their bladder prior to the examination.

Preliminary Image

The plain film focuses on the bladder region.

Technique

To demonstrate **vesico-ureteric reflux** (this indication is almost exclusively confined to **children**):

1. Using **aseptic technique** (which can help keep important equipment from being contaminated in order to protect patients from dangerous germs)
2. Patient lie **supine** on an X-ray table. The radiologist will carefully clean the genital area with a specific antiseptic wash.
3. A small amount of anaesthetic gel is applied to the urethral opening to minimise discomfort. A urinary catheter is then inserted in the tip of the urethra until it reaches the bladder.
4. The bladder is filled with contrast medium until you feel full or bladder filling is observed by intermittent fluoroscopy. It is important that early filling is monitored by fluoroscopy in case the catheter is mispositioning.
5. **Intermittent monitoring is** also necessary to identify **transient reflux**. Any reflux should be recorded.
6. The catheter should not be removed until the radiologist is confident that the patient will be able to micturate, the patient does not tolerate further infusion or until no more contrast medium will drip into the bladder.
7. Once there is sufficient contrast medium in the bladder, the urethral catheter is removed.
8. Older children and adults are given a urine receiver, but **smaller children** should be allowed to pass urine onto absorbent pads on which they can **lie supine**. Children can **lie supine** on the table, but **adults** will probably find it easier to micturate while **standing AP erect**.
9. X-rays are taken during micturition as the contrast medium passes out the bladder through the urethra where and any **reflux** is recorded.
10. In infants and children with a **Neurogenic bladder**, micturition may be accomplished by **suprapubic** pressure.

11. Boys should ***micturate*** in an **oblique** or **lateral *projection***, so that spot films can be taken of the **entire urethra.**
12. *Finally*, a **full-length AP view** of the *abdomen* is taken to demonstrate any undetected reflux of contrast medium that might have occurred into the kidneys and to **record the postmicturition residue**.
13. **Oblique views** are needed when evaluating for **leaks**.

Aftercare

1. Children micturate in a warm bath are helpful in case of dysuria.
2. Antibiotics for urinary tract infection (children)

Complications

1. Urinary tract infection
2. Catheter trauma may lead to **dysuria**, frequency, haematuria and urinary retention.
3. Complications of bladder filling, e.g. perforation
4. Retention of a Foley catheter

Figure 1. Micturating cystourethrography

Figure 2. Micturating cystourethrography

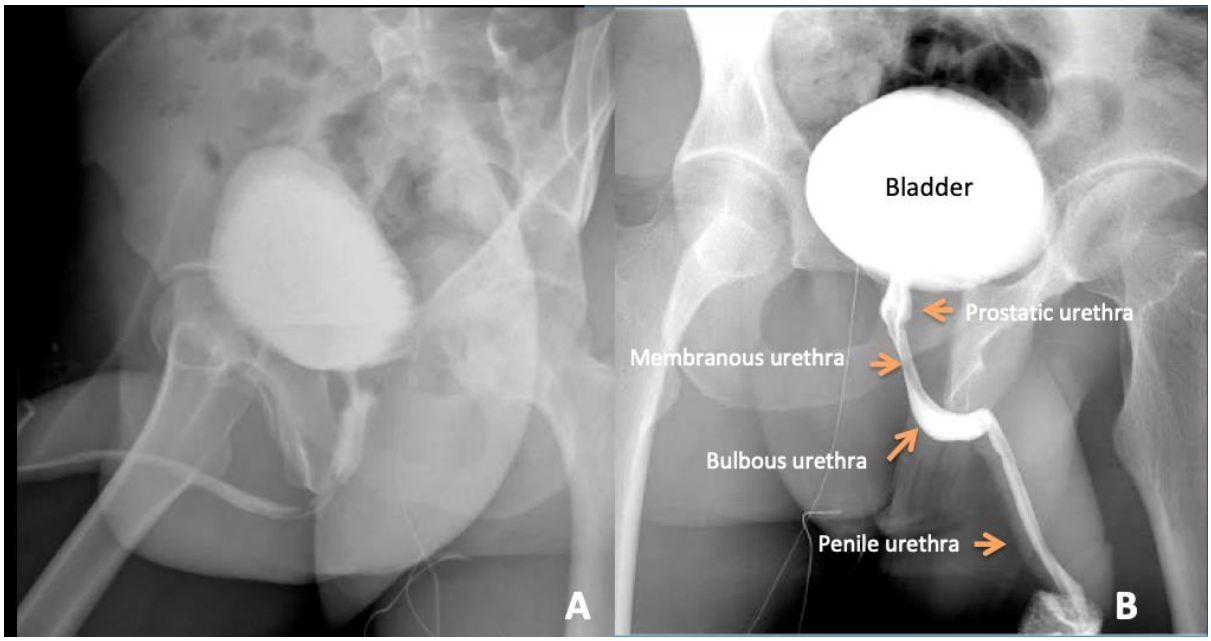

Figure 3. (A) Micturating cystourethrography, Lateral radiograph normal anatomy in a male patient. (B). oblique radiograph in the micturition phase showing the bladder ad the male urethra divided into 4 sections: Prostatic, membranous, bulbous, penile.

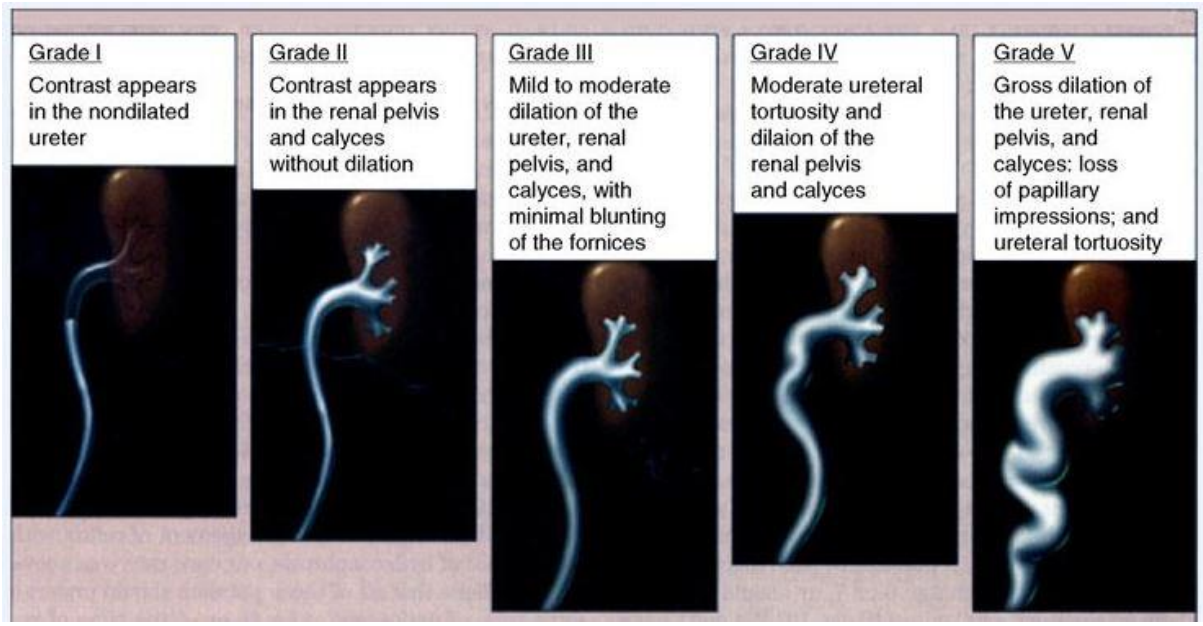

Figure 4. Grade of vesicoureteric reflux

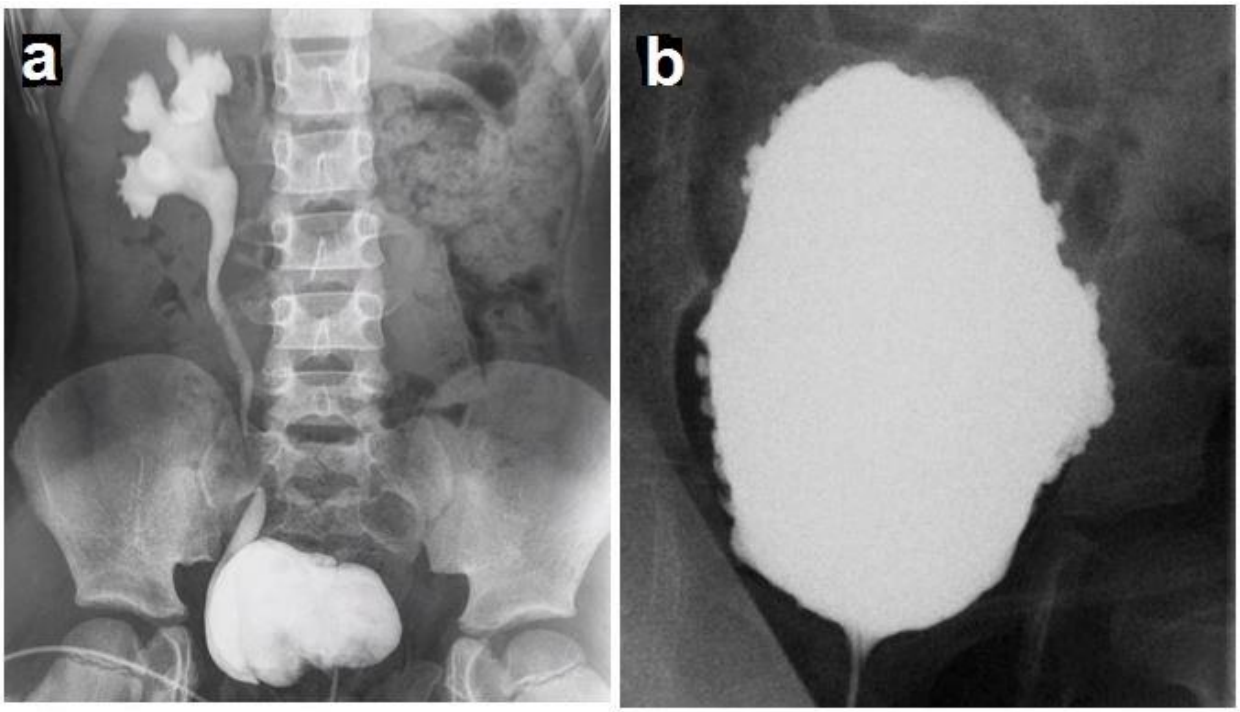

Figure 5. (a) Unilateral vesicoureteric reflux. (b) Neurogenic bladder.