Cystography

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Key Contents

Definition of Cystography.
Types of Cystography.
Indication of Cystography.
Complications of Cystography.

Learning Objectives

To be able to define cystography and explain types.
To know when to perform cystography.
To be aware of possible complications of cystography.

Key words: Cystography, Voiding cystography, CT cystography.

Article Citation: Tahir S, Cystography, Indep Rev Apr-Jun 2012;14(4-6): 265-270.

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Cystography

**RADIO-CYSTOGRAPHY**
It is the contrast medium radiological visualization of the interior of urinary bladder. It is also called radio-cystography.

**ANTEGRADE CYSTOGRAPHY**
It is called antegrade cystography when radio-opaque dye is excreted from kidneys while doing intravenous urography. (Films of bladder area in excretory urography)

**RETROGRADE CYSTOGRAPHY**
It is called retrograde cystography when it is not done as part of intravenous urography. The bladder is filled with the dye through a transurethral catheter 50-100 mls of radio-opaque dye are required to fill an adult bladder without causing discomfort. It achieves reasonably good picture of the bladder

**SUPRAPUBIC CYSTOGRAPHY**
It is called suprapubic cystography when the dye is injected into the bladder through suprapubic puncture and not through transurethral route. This route is used when stricture of urethra makes it impossible to pass a urethral catheter.

**MICTURATING CYSTOGRAPHY, VOIDING CYSTOGRAM (VC)**
It is called micturating cystography when the films are exposed during micturition or during supra pubic pressure on full bladder. It provides very useful information about bladder, bladder neck and urethra2.

**SONO-CYSTOGRAPHY**
Sono-cystography is the ultrasound examination of the bladder. It is performed on distended bladder. The bladder shows a black colour organ on greyscale scan.

It is non invasive method of bladder examination. It provides more information about bladder, bladder wall and perivesical tissue while all other types of radio-cystography can examine only interior of the bladder.

The detection of bladder tumour is equally accurate with combined use of abdominal and trans-rectal ultrasonography. It has its own limitations as it cannot always be used.

**INDICATIONS**
- Retention of urine
- Enlarged prostate
- Bladder inflammation (cystitis

Antegrade cystogram

Serial micturating cystograms showing bilateral ureteric reflux
**STRUCTURE URETHRA**

Stricture urethra is a relative contraindication as it may cause difficulties in the passage of urethral catheter into the bladder.

**PREPARATION**

No special preparation is required.
Allergy to the radio opaque dye is checked.

The cystogram can be performed without much trouble even in patients who are allergic to iodine as the dye is not absorbed from the bladder and it is evacuated with urine.

**PROCEDURE**

Complete procedure is explained to the patient in a language he or she understands clearly. The patients not suffering from stricture of urethra or urethral injury or bladder rupture are asked to pass urine and empty the bladder just before the examination is started.

The patient is put on the x-ray table and the x-ray film is set for exposure. Complete aseptic measures are adopted for the procedure. The surgeon or radiologist scrubs up in the same way as for any other surgical procedure.

External genitalia are cleaned with non irritating antiseptic solution (chlorhexidine, savalon etc.). The sterilized sheets are used to cover the patient and the area of external genitalia is left exposed to carry on procedure.

Pre-sterilized lignocaine jelly is instilled into the urethra. The local anaesthetic jelly requires 5 - 10 minutes for its adequate effect. One should wait during this period.

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**SPECIAL CONDITIONS; URETHRITIS**

Urethritis is the only absolute contraindication because it may spread the urethral infection into the bladder which may be very difficult to eradicate.

**RUPTURE URETHRA**

In suspected cases of rupture urethra and fracture of the pelvis, urethrogram is performed first.

The cystogram is only performed if urethra is not ruptured. Only then the cystogram is performed to check whether the bladder is ruptured or not.
It Is Useless, Painful And Cruel To Rush

First Film
The patient is allowed to empty bladder completely.

Plain x-ray abdomen for bladder area is exposed. Radio-opaque shadows are seen and the film is kept for comparison with the post contrast films.

A small size (8 or 10 fr) pre-sterilized catheter is passed into the bladder through the urethra. Catheter balloon is filled with 2-5 mls of distilled water when the catheter has entered the bladder. In children, small size feeding tube is passed into the bladder through urethra.

Second Film
50 mls of radio opaque dye is instilled into the bladder and catheter is blocked.

Second x-ray picture is exposed. The film is checked for the bladder anatomy and to see whether the diagnosis becomes clearer.

More dye is instilled in patients where bladder is not outlined properly and another x-ray picture is exposed to diagnose the problem with accuracy. 100 to 200 mls of radio-opaque dye is to be used for a voiding cystograms in adults. This much dye initiates the micturating reflex.

Next Films
The x-ray films are exposed in two or three dimensions for clear and adequate diagnosis. The bladder is kept distended and patient is put in Trendlenberg's position in case the uretero vesical reflux is suspected. (Foot end of the table is raised). More x-ray pictures are exposed.

The patient may be asked to strain during exposure of the x-ray film or a pneumatic compression pad may be used to compress the distended bladder.

The presence of dye in the lower part of the ureters confirms the diagnosis of uretero-vesical reflux. The catheter is removed after letting the dye drain out.

Occasionally urethral catheterization is not possible due to stricture, rupture or tumour of urethra.
Suprapubic puncture of the bladder is performed with the intravenous cannula after taking all the aseptic precautions. Local anaesthetic agent is infiltrated in the suprapubic skin area to be punctured in these patients.

The intravesical cannulation is performed on a distended bladder as it is easy and extraperitoneal. The urine is allowed to drain out.

50 mls of radio-opaque dye is injected through intra-vesical cannula into the bladder and x-ray picture is exposed. The films are exposed both antero-posterior and lateral views. Intravesical cannula is removed after the pictures are found to be satisfactory.

**AFTER CARE**

No special care is required other than cleaning the external genitalia. In uncircumcised patients, the prepuce which was folded back in the beginning of the procedure is unfolded and brought back to normal position otherwise paraphimosis may result.

The patient should be asked to stay in the hospital till he/she has passed urine at least twice after the procedure.

**DIRECT RADIONUCLIDE CYSTOGRAM (DRC)**

The direct radionuclide cystogram (DRC) is helpful in detecting ureteric reflux in higher number of cases in children below one year in age whereas micturating cystogram may fail to detect significant reflux in children under one year of age.

**RETROGRADE PRESSURIZED CT CYSTOGRAPHY**

Retrograde pressurized CT cystography is helpful to exclude bladder rupture in patients with high risk. C.T cystography can be performed with 100% sensitivity, 99.6% with high risk. C.T cystography can be performed with 100% sensitivity, 99.6% specificity, 85.7% Positive. Predictive Value and 100% Negative Predictive Value.

Retrograde cystogram showing irregular outline of the bladder. Posterior urethra is dilated and catheter balloon is seen. It is also called "fir tree bladder" (neurogenic bladder)
REFERENCES


