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Paper:- CRP and CP

Q1:- If there is non-visualization of ureteral segment on IVU and CTU which alternative procedure will you perform? What is the general protocol for performing that procedure?

Ans:- Nonvisualization of ureteral segment on IVU and CTU (If there is still clinical concern for evaluating the collecting system after an IVU or CTU, a retrograde Pyelogram may be able to better image the segment of ureter).
Better characterization of ureteral or pelvicalyceal abnormalities seen on IVU or CTU.
To aid in stent placement
Patient who has allergy
For iodinated contrast media

and have renal insufficiency is indicated for evaluation of retrograde urogram. But because the contrast media is not introduced intravenously that possible reaction is low.

Before the procedure:-

- A doctor will explain the procedure to a person and will offer the opportunity to ask any questions regarding the procedure.
- A person will be asked a consent to give permission to do procedure.
- A pregnant patient or suspect to be pregnant should notify the doctor.
- Notify the doctor if a person is having allergy or sensitive related to medication.

Q2. Which radiological procedure is commonly performed for assessing congenital anomalies of renal system? Explain in detail the procedure.

● Intravenous Pyelography

(IVP) :-

An Intravenous Pyelography (IVP) is also called Intravenous urography (IVU) or excretory (EU) is a radiological procedure used to visualize abnormalities of the urinary system, including the kidneys (renal parenchyma, pelvicalyceal system) ureters and bladder.

● Indications:-

- (1) Check for normal function of kidneys.
- (2) Check for anatomical variants or congenital anomalies
for example :-
(horse-shoe kidney)

- (3) Check the course of the ureters
- (4) Detect the localized a ureteric obstruction (urelithiasis)
- (5) Assess for synchronous upper tract disease in those with bladder transitional cell carcinoma (TCC).

● Contraindication:-

- Contrast allergy
- Hepato-renal syndrome.
- Thyrotoxicosis
- Raised serum creatinine.

● Contrast media:-

HOcm or LOcm 370 are acceptable but the following 'high risk' groups should receive LOcm.

(1) Infants and small children and the elderly.

(2) Those with renal and/or cardiac failure.

(3) Poorly hydrated patients

(4) Patients who have a previous severe contrast medium reaction with LOcm or those with a strong allergic history

- Adult dose :- 50ml
- Paediatric dose :- 1ml kg⁻¹

• Patient Preparations:-

1. No food for 5 hr prior to the examination. Dehydration is not necessary and does not improve image quality.
- (2) Patients should preferably be ambulant for 2 hr prior to the examination to reduce bowel gas.
- (3) The routine administration of bowel preparation fails to improve the diagnostic quality of the examination and its use to make the examination more unpleasant for the patients.
- (4) If the examination is to be performed on a patient who has previously had a severe contrast medium reaction consideration should be given to administering methyl

Prednisolone 32 mg orally
12 and 2 hr prior to
injection of contrast medium
in addition to ensuring that
10cm is used.

● Preliminary film:-

(1) Supine, full length AP of
the abdomen in inspiration
The lower border of the
cassette is at the level
of the symphysis pubis
and the X-ray beam is
centred in the mid line
at the level of iliac crests.

→ The position of overlying
opacities may be further
determined by:-

(2) Supine AP of the renal areas
in expiration - The X-ray
beam is centred in the
mid-line at the level of
the lower costal margin.

(3) 35% posterior oblique
view.

(4) Tomography of the kidney at the level of a third of the AP diameter of the patient (approx 8-11 cm). The optimal angle of swing 25-40°.

Techniques:-

The median antebital view is the preferred injection site because flow is retarded in the cephalic vein.

- A 19-g needle is advanced up the vein to reduce the risk of perivenous injection and the injection is given rapidly as a bolus to maximize the density.

- Upper arm or shoulder pain may be due to contrast medium in the vein. This is relieved by abduction of the arm.

Films:-

(1) Immediate film:-

AP of the renal areas. This film is exposed 10-14 s after the injection (arm to kidney) time - It aims to show the nephrogram i.e. the renal parenchyma by contrast medium in the renal tubules.

(2) 5-min film:-

AP of the renal areas - This film is taken to determine if the excretion is symmetrical & is assessing the need to modify techniques e.g. further injection of contrast medium if there has been poor initial opacification -

Compression is contraindicated:-

- (a) After recent abdominal surgery.
- (b) After renal trauma
- (c) If there is a large abdominal mass.

(d) when the 5 min film shows already distorted calyces.

(3) 15-min film:- AP of the renal areas. There is usually adequate distension of the pelvicalyceal system with opaque urine by this time. Compression is released when the satisfactory demonstration of pelvicalyceal system has been achieved.

(4) Release film:- Supine abdomen. This film is taken to show the whole urinary tract. If this film is satisfactory the patient is asked to empty their bladder.

(5) After micturition film:- Based on the clinical findings and radiological findings on the earlier film. These will be either abdominal film or a coned view of

bladder with tube angled 15° caudad and centre 8 cm above symphysis pubis -

Additional films:-

- (1) 35° posterior oblique of the kidneys, ureters or bladder
- (2) Tomography when there are confusing overlying shadows
- (3) 30° caudad angulation of the tube for the renal area.
- (4) Prone abdomen may provide better visualization of the ureters by making them more dependent.
- (5) Delayed film - may be for up to 24 hr after the injection in cases of obstructive uropathy

Complications:-

- Due to the contrast medium -
- Due to the technique:- Incorrectly applied abdominal compression may produce considerable discomfort or hypotension -

Q3: Which procedure is performed for investigation of extrahepatic biliary obstruction? Discuss the general protocol followed for the procedure.

Ans: ERCP:-

Endoscopic retrograde cholangiopancreatography is a technique that combines the use of endoscopy and fluoroscopy to diagnose and treat certain problems of the biliary or pancreatic ductal system.

→ Although percutaneous transhepatic cholangiography (PTC) has a higher success rate for demonstrating bile ducts, ERCP has 3 (three) advantages:-

(1) The ability to visualize & biopsy lesions.
(2) The demonstration of biliary tree and pancreatic duct.

(3) Greater therapeutic potential.
It is performed by physician or surgeons than radiologists.

● Indications:-

- (1) Investigation of extrahepatic biliary obstruction.
- (2) Investigation of diffuse biliary disease e.g. sclerosing cholangitis.
- (3) Pancreatic disease.

● Contrast Media:-

- (1) Pancreas :- 10cm 240
- (2) Bile ducts :- 10cm 15 :-
White contrast medium ensures that calculi will not be obstructed.

● Equipment:-

- (1) Side viewing endoscope.
- (2) Polythene catheters
- (3) Fluoroscopic unit with spot film facilities

Patient preparation:-

- (1) Nil orally for 4 hr prior to procedure
- (2) Pre-medication
- (3) Antibiotic cover.

Techniques:-

The pharynx is anaesthetized with 4% Nylocaine spray and the patient is given diazepam 5mg min. i-v sedated.

- The patient then lies on the left side and the endoscope is introduced.
- The ampulla of water and located then the patient is turned prone.
- Small test injection of contrast under fluoroscopic control is made to determine the position of the cannula.

Films:-

Pancreas (using Fine Focal Spot)

- (1) Prone, both posterior oblique Bile ducts
- (1) Early filling films to show calculi
- (a) Prone - Straight & posterior obliques.
- (b) Supine - Straight Both oblique to fill intrahepatic ducts Semi-erect to fill lower end of common bile duct and gall bladder.
- (2) Films following removal of the endoscope which may obscure the duct.
- (3) Delayed film to assess the gall bladder & emptying of the common bile duct.

Complication:-

Due to contrast medium

- (1) Allergic reaction - rare
- (2) Acute pancreatitis - more likely which large volumes high pressure injections.

- Due to Techniques

• Local:-

Damage by the endoscope e.g. rupture of the esophagus, damage to the ampulla

• Distal:-

Bacteraemia, aspiration, pneumonitis, hypoxemia, ischaemia (approx 90%)
Acute pancreatitis (0-7-7.4%)

Q4. Which radiological procedure is recommended for evaluating the cause of female infertility. Explain procedure in detail?

• Hysterosalpingogram.

ly (HSG) :- Also known as uterosalpingography, is a fluoroscopic examination of the uterus and fallopian tubes.

- It is performed to investigate the shape of uterine cavity and the shape of patency of the fallopian tube.
- Hystero means uterus
- Salpingo means fallopian tubes
- Graphy means to draw.

● Indications:-

- (1) Infertility
- (2) Recurrent miscarriages
- (3) Following tubal surgery
- (4) Assessment of the integrity of a Caesarean uterine scar.

● Contraindication:-

- (1) Pregnancy
- (2) A purulent discharge on inspection of the vulva or cervix, or diagnosed PID in the preceding 6 months.
- (3) Recent dilatation and curettage or abortion or immediately post-menstruation - This applies only to oily contrast medium because of the risk of intravasation.
- (4) Contrast sensitivity.

Contrast Medium:-

- Oily contrast medium is no longer recommended.
- HOCM or LOCM 300 val-10-20
- LOCM have no advantages with regard to image quality or side effects but the monomeric dimer associated with a lower incidence and decreased severity of delayed pain.

Equipment:-

- (1) Fluoroscopy unit with spot film device
- (2) Vaginal speculum.
- (3) Pulsellum forceps.
- (4) Uterine cannula, Leech-Wilkin

Patient Preparation:-

- 1) The patient should abstain from intercourse between booking the appointment and time of the examination unless she uses a reliable method of contraception.

2. Apprehensive (fearful) patients may need premedication.

• Preliminary film:-

- Coned PA view of the pelvic cavity.

• Technique:-

The patient lies supine on the table with knees flexed legs abducted and heels together.

- (2) Using aseptic technique the operator inserts a speculum and cleans the vagina and cervix with chlorhexide.
- (3) Spasm of the uterine cornu may be relieved by i-v glucose.
- (4) Care must be taken to expel all air bubbles.
- (5) NB Opiates increase pain by stimulating smooth muscle contraction.

Film 8:-

Using the undercouch tube:-

- (1) As the Tube begin to fill.
- (2) When peritoneal spill has occurred and with all the instrument removed.

Complication:-

Due to the Technique:-

- (1) Pain may occur at the following times:-
 - (a) using the vulsellum forceps.
 - (b) During insertion of the cannula.
 - (c) With tubal distention proximal to a block.
- (2) Bleeding from Trauma to the uterus or cervix.
- (3) Transient nausea, vomiting and headache.
- (4) Infection - which may be delayed. Occurs in upto 2% of patient or who had pelvic infection in past.
- (5) Abortion:- The operator must ensure the patient is not pregnant.

• Detectable Pathology:-

Conditions that may include HSG:-

• Uterine pathologies:-

- (1) Uterine congenital anomalies
- (2) Submucosal uterine fibroid
- (3) Adenomyosis
- (4) Uterine malignancy
- (5) Uterine polyp

• Tubal pathologies:-

- (1) Tubal polyp
- (2) tubal malignancy
- (3) hydrosalpinx
- (4) tubal spasm that can be physiological.
- (5) Salpingectomy.

Q5:- Explain in detail the conventional radiological procedure used for diagnosing the disorder of joints, ligaments and tendons.

● Arthrography:-

It is a type of medical imaging used in the evaluation and diagnosis of joint conditions and such pain. It is very destructive disease that affects the ligaments, tendons and joint.

Arthrography may be indirect where contrast material is injected into the bloodstream or direct where contrast material is injected into the joint.

Computed tomography (CT) scanning, magnetic resonance is a form of real time x-ray may be performed after arthrography to image the joint.

Common uses of the procedure :-

The procedure is most often used to identify the abnormalities within the -

- (1) Shoulder
- (2) Elbow
- (3) Wrist
- (4) Hip
- (5) Knee
- (6) Ankle.

The procedure is often used to help in diagnosing persistent, unexplained joint pain, discomfort

In some cases local anesthetic medication or steroids may be injected into the joint along the contrast material.

Direct arthrography is particularly effective for detecting disease of the structure within the joints such as ligaments, labrum, tendons and cartilage.