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 Radiological procedure  
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Q2

Ans: The Radiological procedure  
 used for the diagnosis  
 of anomalies is  
 Intravenous Pyelography.

$\Rightarrow$  INTRAVENOUS PYELOGRAPHY  $\Rightarrow$  (IVE)

it is also called intravenous  
 urogram. It is a radiological  
 procedure used to visualize  
 abnormalities of the urinary  
 system.

including:-

kidney, ureters & bladder x-ray.

**INDICATIONS:**

- checks for normal function of kidneys.
- checks the course of the ureters.
- detect and localized a cystic / obstruction.

**Contraindications:**

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

**Contraindications:**

- HoCM or LoCM are acceptable.
- 2. Infants & small children and the elderly.
- 3. Those with renal & or cardiac failure.
- 4. Poorly hydrated pt.
- 5. Adult dose: 50ml.
- 6. Paed. child dose: 1 ml/kg.

**Patient preparations:**

For a full list of patient prep -> p-10

1. No food for 8 hrs.
2. Patients should be preferably be ambulant for 2hr 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 it is used to make the examination more unpleasant for the pt.

### PRELIMINARY FILMS:-

1. Supine, full-length AP of the abdomen in inspiration. The lower border of the cassette is at the level of Symphysis pubis & x-ray beam is centered in the mid-line at the level of the iliac crests.
2. Supine AP of the renal areas, in expiration.

3. 25% posterior oblique

view

4. Tomography of kidneys  
at the level of third  
of the AP diameter of  
the pt. (8-11 cm), optimal  
angle of swing is 25-40°.

### Techniques

→ The median antecubital vein is the preferred injection site bc flow is retarded in the cephalic vein as it pierces the clavifectoral fascia.

→ A 25-G needle is advanced up the vein to reduce the risk of a perivenous injection & the injection is given rapidly as bolus to maximize the density of the nephrogram.

→ upper arm may be due to stasis of contrast medium in the vein.

FILMS:-

1. Immediate films ->

Ap of the renal areas. This film is exposed 10-14s after the injection. It aims to show the nephrogram.

2. 5-min films ->

Ap of renal areas. This film is taken to determine if excretion is symmetrical & is invaluable for assessing the need to modify technique.

3. 15-min films ->

There is usually adequate distinction of the pelvicalyceal system with opaque urine by this time. Compression is released when satisfactory demonstration of the pelvicalyceal system has been achieved.

4. Release films ->

Supine Ap abdomen. This film is taken to show the whole urinary tract.

P-T-O

### 5. After erectum films

This based on clinical findings and the radiological finding on the earlier film. This will be full-length abdominal film or a coned view of the bladder with the tube angled  $15^\circ$  caudad and centred 5cm above the Symphysis Pubis.

### ADDITIONAL FILMS:

1.  $35^\circ$  posterior obliques of the kidneys.
2. Tomography - when there are confusing overlying shadows.
3. prone abdomen - may provide better visualization of the ureters by making them more dependent.

### Complications:

- > Due to contrast medium.
- > Due to the technique incorrectly applied abdominal compression may produce intolerable discomfort.

Q-3

Ans:

ERCP are required for the investigation of Extrahepatic biliary obstruction.

1) Endoscopic retrograde cholangiopancreatography (ERCP) :-

It is a technique that combine the use of endoscopy & fluoroscopy to diagnose and treat certain problems.

#### INDICATIONS:-

1. Investigation of extrahepatic biliary obstruction
2. Post-cholecystectomy Syndrome
3. Investigation of diffuse biliary duct disease.
4. Pancreatic disease.

#### Contraindications:

1. Oesophageal obstruction, varices
2. Previous gastric surgery
3. Acute pancreatitis.
4. Pancreatic pseudocyst.
5. Severe cardiorespiratory disease.

Contrast Mediums

Pancrease - LOCM 240

Bile ducts - LOCM 150

Equipments

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

PI preparation:

1. Nil orally for 4h prior to procedure
2. premedication
3. Antibiotic cover

Preliminary film:

from AP and LAO of the upper abdomen, to check for gas.

TECHNIQUE

- The pharynx is anesthetized with 4% xylocaine spray & the PI is given diazepam 5mg min-1. IV unit sedated
  - The PI then lies on the left side & the endoscope is introduced.
- D-F-O



- The ampulla of Vater is located and the pt is turned prone.
- A small test injection of contrast under fluoroscopic control is made to determine the position of the cannula.

**FILMS-**

Pancrease (using fine good spdt)

1. Prone both posterior oblique Bile ducts.
  1. Early filling film to show calculi.
    - a. prone - straight & p-oblique.
    - b. supine - straight, both oblique.
2. Film following removal of the endoscope
3. Delayed film to assess the gallbladder & emptying of the common bile duct

**AFTERCARE:-**

1. Nil orax until sensation has returned to the pharynx (2-3h)
2. Pulse, Temp & Bp half-hourly for

3. Serum/urinary amylase if pancreatitis is suspected.

### Complications:-

→ Due to contrast medium.

1. Allergic reactions - rare

2. Acute pancreatitis - more

likely with large volumes.

→ Due to the technique.

### Local:-

Damage by the endoscope.

eg - rupture of the oesophagus.

damage the ampulla.

### Distant:-

~~Damage~~

Bacteraemia, sepsis, Septicemia,  
aspiration pneumonia,

hyperamylasaemia (Approx 7%)

Acute pancreatitis (0.7-7.4%).

Q-4

Ans-

## HYTEROSALPINGOGRAPHY (HSG)

It is also known as uterosalpingography, is a fluoroscopic examination of the uterus and the Fallopian tubes.

### INDICATIONS

1. Infertility
2. Recurrent miscarriages
3. Following tubal surgery
4. Assessment of integrity of a Caesarean uterine Scar.

### CONTRAINDICATIONS

1. Pregnancy
2. A purulent discharge on inspection of the vulva or cervix.
3. Recent dilation & curettage or abortion.
4. Contrast sensitivity.

**CONTRAST MEDIUM:-**

- > Oily contrast medium is no longer recommended.
- > HOCM or LOCM 300. V. 10-20ml
- > LOCM have no longer advantage.

**EQUIPMENTS:-**

1. Fluoroscopy unit with spot film device
2. vaginal speculum
3. vulsellum forceps
4. uterine cannula, cath.

**PT - PREPARATIONS:-**

1. The patient should abstain from intercourse b/w booking the appointment and the time of examination unless she uses a reliable method of contraception at the examination.
2. Apprehensive pts may need premedication.

**PRELIMINARY FILM:-**

→ Comed PA view of the pelvic cavity.

**TECHNIQUE:-**

1. The pt. lies supine on the table with knees flexed
2. Using aspect technique the operator inserts a speculum & cleans the vagina & cervix with chlorhexidine
3. The anterior lip of the cervix is steadied with the vulsellum forceps & cannula is instead inserted into the cervical canal. I G/Boley catheter is used there is cervix with the vulsellum forceps.
4. Care must be taken to expel all air bubbles from the syringe & cannula

5. Spasm of the uterine  
cervix may be relieved  
by IV glucagon.

→ NB:- opiates increase pain  
by stimulating smooth muscle  
contraction.

**FILMS:-**

using the underneath Table.

1. As the tubes begin  
to fill

2. when peritoneal has  
occurred & with all the  
instruments removed.

**AFTERCARE:-**

1. It must be ensured that  
the pt is in no serious  
discomfort nor has significant  
bleeding per vagina before  
she leaves.

2. The pt must be  
advised that she may have  
bleeding per vagina for  
1-2 days & pain may  
persist for up 2 weeks.

Complications -

1- Due to the technique -

1- pain may occur at the following times -

- a. using the uterine forceps.
- b. during insertion of cannula.
- c. with tubal distention proximal to a block.

2- Bleeding from trauma to the uterus or cervix.

3- Transient nausea, vomiting & headache.

4. Intravasation of contrast medium into the venous system of the uterus in

a. Fine lace-like pattern within the uterine wall.

- a. direct trauma to endometrium.
- b. Timing of procedure near to menstruation.

c. uterine abnormalities.

5- Infection - which may be delayed.

→ Due to contrast medium →  
 1. Allergic Phenomena, especially if contrast medium is forced into the circulation.

**DETECTABLE PATHOLOGY:-**

↳ Uterine pathologies:-

- uterine congenital anomalies.
- submucosal uterine fibroids.
- uterine malignancy.
- adenomyosis.

↳ Tubal pathologies:-

↳ Tube polyps

- Tubal Malignancy.

↳ Hydrosalpinx

- Salpingectomy

↳ Tubal spasm

↳ can be physiological

- Salpingitis isthmica

↳ nodosa (SIN)

↳ chronic



**Ques** **ARTROGRAPHY** :-  
 It is a series of images of a joint after injection of a contrast medium.

#### Method:-

- Single contrast.
- Double contrast.

#### Indications:-

- > Joint capsule form.
- > Joint cavity.
- > Synovial membrane.
- > Ligaments.
- > Tendon.
- > Loose bodies with joints.

#### Contraindications:-

- > Active arthritis.
- > Joint infection.
- > Bleeding problems.
- > Previous sensitivity to contrast media.

#### Equipment:-

- Fluoroscopy with spot film devices.

**Preliminary Films** →

- Routine plain film radiograph.
- AP & True Lateral of the wrist joint of interest.
- Ant Shoulder & oblique view
- Radial & ulnar deviation & in wrist joint.

## After care →

- Avoid driving for 2 days
- Joint pain may occur.

**Complications**

- Allergic reaction
- Synovitis
- pain capsular rupture
- Trauma to adjacent structures

**KNEE Joint Arthrography**

- pt. lying supine
- using sterile technique the skin & underlying soft tissue are anesthetized posterior to mid point of the patella.
- 2% lidocaine injection instead to the knee joint space.

- Then full volume of contrast medium (40ml) is injected followed by 40ml of air for double contrast.
- The needle is then removed & the limb is exercised for uniform distribution of contrast.

### HIP Arthrography

- The pt is lying supine with legs internally rotated so that the entire length of femoral neck is visualized.
- The position of the femoral vessels are visualized to avoid puncture.
- The skin is clean aseptic technique.
- Test injection of contrast will demonstrate correct positioning of the needle.
- inject 6-10ml contrast under fluoroscopic control.

## Shoulder Arthrography

- The patient is laying supine with arm of side under examination close to the body external rotation.
- ) Using sterile technique the skin & soft tissue are anesthetized 1cm inferior & 1cm lateral to the coracoid process a spinal needle is 2/3 is inserted.
- The needle is then removed & joint is exercised for uniform distribution of contrast medium.

Q.1)

Ans)

?

RETROGRADE PYELOURE-

TEROGRAPHY :-

(RPU)

It is the study that the collecting system is evaluated by directly injection radiographic contrast through catheters.

Indications -&gt;

1. Demonstration of the site, length, lower limit & if possible, the nature of an obstructive lesion.
  2. Demonstration of the pelvicalyceal system after an unsatisfactory excretion urogram.
  3. Better characterization of ureteral
  4. To aid in stent placement
- Contraindications ->

- > Acute urinary tract infection
- > pregnancy
- > Recent instrumentation

### Contrast medium ->

-> HOCM or LOCM 150-200  
eg. not too dense to  
obscure small lesions.

### Equipments ->

Fluoroscopy unit

PT preparation ->

As for surgery

Preliminary film -

For Leaja supine AP abdomen,  
when the examination is  
performed in a x-ray  
department

### Techniques ->

-> After the PT has been  
anesthetized, the procedure begins  
by ensuring proper positioning  
of the PT

-> Once positioning is complete,  
a cystoscopy is performed.

-> The physician then uses  
or BF open ended or cone-  
tipped catheter to cannulate  
the ureter that needs to

- be imaged.
- AT this point radiographs are taken to ensure proper placement of the catheter.
- if there is pelviureteric junction obstruction, the contrast medium in the pelvis is aspirated.

**FILMS:-**

- using undercouch tube.
- 1. Supine PA of the ureter.
- 2. both 35° anterior oblique of the ureter.

NB:- The catheter may be left in the pelvis to drain pelviureteric obstruction.

**Aftercare:-**

- 1. post- anaesthetic observation.
- 2. prophylactic antibiotic may be used.

**Complication:**

- Due to anaesthetic:-  
 Complication of general anaesthesia.

(24)

MOTOWITZ

H/W/C/W

Date: / /

∴ Due to technique:-

- 1- Intro of infection
- 2- Mucosal damage to the ureter.
- 3- Perforation of the ureter or pelvis by the catheter.

∴ Due to contrast medium:-

1. Contrast medium can be absorbed from the renal pelvis.
2. Chemical pyelitis - if there is stasis of contrast medium.
3. Extravasation due to overdistension of the pelvis.