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UVA Assignment of

CRP and CP

submitted to #

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Q No 1

Ideal Contrast agent

For IV administration

ANS:-

The Ideal Contrast agent for IV route is Iodinated LoCM (low osmolality contrast medium) and IOCM

→ The osmolality of these contrast agent are 2-3 times the osmolality of a blood

→ LoCM included

→ Iopamidol (Isovue)

→ Iopromide (Ultravist)

→ Iohexol (Optiray)

→ Iohexal (Combi Paque)

The LoCM also contain Iso-osmol contrast media (IOCM) which has about

Same osmolality as blood  
and are much less toxic  
→ The only ICM uses  
currently are Iodine  
→ Iodixolol (Visipaque)  
The clinical structure of  
Visipaque fits a higher  
concentration of Iodine  
atoms per osmole,  
Permitting diagnostic level  
of contrast opacification  
at less toxic osmolality

## Ideal Properties of

### IU Contrast:-

- Non toxic
- Safe
- Should not cross blood-brain barrier
- Similar physiologic properties when compared with to blood saliva
- Opacification

- inertness
- Low surface tension
- Easy ejection or elimination
- easily injectable
- Residual Contrast media
- Water soluble is more effective than lipid soluble.

## Favourable Characteristics to be as IV Contrast

- Low osmolality
- Proper viscosity
- Less chemotoxic
- These contrast should safe with elevated Creatinine level
- it would not impact GFR
- it may also safe in elderly people, child and pregnant women.

→ These contrast should bear all the properties mentioned above

→ The person with liver disease can use it safely.

—————  
favourable contrast  
to be or in contrast

Q No 2

Ans:

Venography:-

→ It is also called  
"Phlebography" or  
"ascending phlebography"

→ Venography is an  
x-ray examination that  
uses an injection of  
contrast material to  
show how blood flows  
through your veins.

→ In this procedure  
the doctor may find  
the blood clot.

→ Identify a vein for  
use in a bypass  
procedure or dialysis  
access or to assess  
varicose veins before surgery.

→ It is a procedure in which X-ray of vein, a venogram is taken after a special dye is injected into bone marrow or vein

→ Dye has to be injected constantly via catheter making it an invasive procedure

→ Normally the catheter is inserted by the groin and moved to the appropriate site by navigation through vascular system.

## Indication:-

- Deep Venous Thrombosis
- Congenital abnormality of venous system

→ Oculomotoric dysfunction  
Cause -

## Contraindication:

- Local Sepsis
- Previous Severe Contrast medium reaction
- Allergic to iodinated Contrast Agent
- Impaired renal function test

## Contrast medium:

The Contrast medium may be

- Low osmolar Contrast medium (LOCM)
- High osmolar Contrast medium (HOcm)



## Equipment:

The equipment for venography consists of

- Fluoroscopy with Spot film devices
- Tilting radiography Table

## Patient Preparation

The patient should be well prepared.

The leg will be elevated overnight to lessen oedema if the leg swelling is severe.

## Technique:

- The patient is lying supine
- Head tilted up  $40^{\circ}$  to  $45^{\circ}$  degree to decay

delay the transit of  
contrast medium

→ A tourniquet is applied above ankle joint occlude the superficial, anterior tibia vein.

→ A 19g butterfly needle is inserted into vein of dorsum foot.

→ 40ml contrast is injected by hand and spot film is selected area are taken.

→ further 20ml bolus contrast is injected while compression is applied to delay that transit time of contrast in to upper thigh and pelvic vein.

→ The compression is released over femoral vein with patient head side down

→ Spot film are taken after 2 second.

→ The needle should be flushed with normal saline to reduce the chance of phlebitis due to contrast medium.

## ⇒ Films:-

→ film of venography are

→ AP of calf

→ Both calf (feet externally and internally)

→ AP of the popliteal common femoral and iliac vein

After Care:-

→ The limb should  
be exercised.



"No. 13016"

Q No 3

Ans: Loopogram:-

→ A Loopogram is a diagnostic test that is performed on section of bowel that function in place of urinary bladder

→ A Loopogram is a radiographic exam that will visualize the loop of bowel that has been surgically connected to substitute for your urinary bladder

→ Patient who do not have bladder or have malfunctioning bladder may undergo a surgical procedure called a Urinary

**diversion** To rotate the flow of urine through an opening in Abdomen. The opening is called "Stoma".

→ The Stoma has no muscle and cannot control urine flow

→ So that urine flow continuously through it.

→ Sometime section of bowel usually the small intestine is removed and repositioned to enable to flow from Ureter that connect the kidney to stoma. This section of bowel called "ileal Conduit".

⇒ A Loopogram is a fluoroscopic study of an ileal conduit which is a type of urinary diversion.

## ⇒ Terminology:-

This procedure also known as  
ileal Conduitogram

→ ileal Coopogram  
or

Ileostouveterography

## ⇒ Procedure:-

it is a  
retrograde study in  
which contrast is  
injected via anterior  
abdominal wall stoma  
of ileal Conduit

→ The stoma is  
initially "catheterized"  
with urinary catheter  
to allow access.

→ A series of images are  
taken in a number of positions.

To assess the Conduit

→ In the majority of cases a Postoperative stricture being the chief clinical concern-

→ It is typically to observe contrast entering the ureter during the procedure-

## After the Procedure!!

→ You will need to put a new stoma bag and off you go

→ You may experience a bloated feeling as the bowel is distended with contrast during procedure.

→ But it should not be painful

→ Minor bleeding can occur from the fistula



→ The risk of infection is small

→ Normally result will be you gettings about 2-4 weeks after procedure.

Examination that show

Loopogram:-

Loopogram examination

Show the following

→ Kidney

→ Ureum

→ Stomach

→ Uterus

→ It is done to ensure that the conduit and surrounding organ are functioning efficiently

## Ben fits :-

→ This examination will help your doctor to make a correct diagnosis or decision about your treatment.

## Associated Risk

→ It is an X-ray procedure so there are some risks associated with radiation.  
→ But the radiation must be kept as minimum as possible.

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Q No 4

Role of technologists  
in performing Fluoro  
scopy:-

ANS:-

Radiographers  
may perform noninter-  
pretive fluoroscopic procedure  
and assist licensed practitioner  
with fluoroscopic and  
specialized interventional  
imaging procedure

→ The American College  
of Radiology suggests  
that technologists receive  
formal training in radiation  
management

→ Radiographers frequently are trained to perform double contrast barium enema examinations.

The research reports says that radiographers produce studies that are comparable to radiologist managed studies.

→ According to the American Society of Radiologic Technologists (ASRT) Radiographer scope of practice the technologist is responsible for the following parts of the medical imaging procedure

→ Reviewing the patient's clinical history to ensure the proper imaging procedure has been ordered

→ Preparing the Patient for the Procedure

→ Select the proper imaging equipment and associated accessories

→ Positioning Patients to best demonstrate the anatomy of interest

→ Immobilizing Patients as necessary

→ Preparing and administering medication, such as contrast agents, prescribed by a licensed practitioner

→ Demonstrate

→ Determining the radiographic exposure technique, while applying principles of radiation protection to the patient and staff.

→ following image acquisition, the radiographer should evaluate the images before submitting them to the radiologists.

→ image should demonstrate proper patient positioning

→ appropriate anatomy and overall satisfactory image quality.

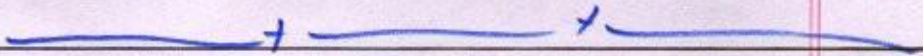
→ the technologists must record the justification for the repeated image

→ 10 additional images might improve the overall diagnostic value of the procedure

→ 10 additional images are obtained.

→ Radiographer also should develop and maintain

a technique chart for imaging equipment, including fluorescence system, to minimize repeats caused to exposure error.



Q No 5

Ans

Catheter:-

A catheter are medicine device that can be inserted in body to treat disease or perform a surgical procedure

→ It is a soft hollow tube made from medical grade materials serving a broad range of function.

→ By modifying the materials or adjusting the way catheter are manufactured.

→ It is possible to tailor catheters for



→ Urological

→ Neurovascular

→ Cardiovascular

→ Ophthalmic application

→ Urological

→ it can be inserted  
into a body cavity  
ducts or vessels

→ Functionally

They allow Drainage

→ Crises

→ Administration of  
fluid

→ Access by Surgical  
instruction

→ it Perform a wide  
variety of other tasks  
depending on type of  
catheter

# ⇒ Process of inserting

## Catheter:-

The process of inserting a catheter is called "Catheterization".

→ A catheter left inside the body either temporarily or permanently

→ may be referred to as an "indwelling"

Catheter: (e.g. a peripheral inserted central catheter)

## Uses of Catheter:-

→ Placement of a catheter into a particular part of body may allowed

## Urinary Catheter

→ Drainage of urine from the urinary bladder as in urinary catheterization e.g. intermittent catheter or Foley catheter

→ Passing the catheter through the urethra into the bladder to drain the urine and then it is removed

⇒ Drainage of urine from kidney by Percutaneous nephrostomy

⇒ Drainage of fluid collection e.g. an abdominal abscess

⇒ Pigtail Catheter

Pigtail catheter used to drain air from

around lung (pneumothorax)

⇒ Administration of  
intravenous fluid medication  
or Parenteral nutrition  
with a peripheral  
venous catheter

⇒ Angioplasty, Angiography

Ballon Sinuplasty  
catheter ablation  
often Seldings technique  
is used.

⇒ A subcutaneous  
Administration of insulin  
or other medication with  
use of an infusion set  
and insulin pump

⇒ Direct measurement  
of blood pressure in  
an artery and vein

⇒ Direct measurement of intraarterial pressure

⇒ Administration of anesthetic medication into the epidural space, the subarachnoid space or around a major nerve bundle such as the brachial plexus.

⇒ A central venous catheter is a conduit for giving drugs or fluids into a large-bore catheter positioned either in vein near the heart or just inside the atrium for measuring pressure in heart.

⇒ An embryo transfer catheter is designed to insert fertilization into uterus.

They may vary in length from approximately 150-190mm

⇒ An Umbilical line is a catheter used in neonatal intensive care unit (NICU)

providing quick access to central circulation of premature infants.

⇒ A Quinton catheter is a double or triple lumen, external catheter used for haemodialysis

⇒ A Swan-Ganz catheter is a special type of catheter placed into the pulmonary artery for measuring pressure in the heart.

# Types of Catheter

There are many types of catheter are available some of which are as follows.

→ Urinary Catheter

→ Digital Catheter

→ Foley Catheter

→ Indwelling Catheter

→ Short term Catheter

→ External Catheter

→ Intermittent Catheter

→ Swan-Ganz Catheter

→ Quinton Catheter

# Guide Wire

A wire or spring used as a guide for placement of a larger device or prosthesis, such as catheter or intramedullary pin

OR

A device used to enter tight spaces e.g. obstructive valves or channels within the body or to assist in inserting, positioning and moving a catheter.

Guide wire vary in

→ Size

→ Length

→ Composition

→ Stiffness

And shape of the tip



→ Tiny guidewire one designed to navigate vessels to reach a lesion or vessels segments

→ once the tip of the device arrives at its destination it acts as guide that larger catheter can rapidly follow for ~~for~~ ~~passive~~ ~~delivery~~ to treatment site.

→ Guide wire come in two basic configuration  
\* Solid steel or nitinol core wire and solid core wire in small wire coil.

### 3- Step Process

(1) Guidewire stays inside the tip of catheter until ready for use

→ Increase risk associated with being too far in or out

Too far in:-  
Blood clots  
due to large amounts  
of dead space in  
catheter.

Too far out  
Dissection  
of blood vessels.

(ii) Guide wire advances distally into the blood vessels.

→ Distal guidewires access offers anchored stability for catheter advancement.

(iii) Catheter Advance along the guide wire until it return to position.

→ Torque is applied to  
catheter to

→ Aid in following  
guide wire contours-

→ Reduce friction.

## Covers

Polymer or plastic

→ Lubricity

## Coating:-

→ Distal half

→ Create tactile feel

→ Reduce friction

→ Affect lubricity

and tracking

→ Facilitate movement  
of wire within vessels

## Different types

### of wire:-

→ Rail wire

→ Access wire

→ Maneuvering wires

## Hydrophobic wires:-

~~via abir do 2020~~

Silicon based coating

→ Repel water (phobic)

→ Require no activation  
by liquid to create a  
wax-like surface

→ Reduce friction

→ increase tackability  
of wire

## Hydrophilic:-

→ Water loving

→ Applied over entire  
working length of wire  
including tip of coils

→ Attract water  
Need lubrication

→ Decrease friction

→ increase tackability

→ Reduce thrombogenic

→ increase Risk of Perforation

→ Tendency to stick to angioplasty catheter -

## Uses of Guide wire

→ Guide wire used to enter tight spaces e.g. obstructed valves or channels.

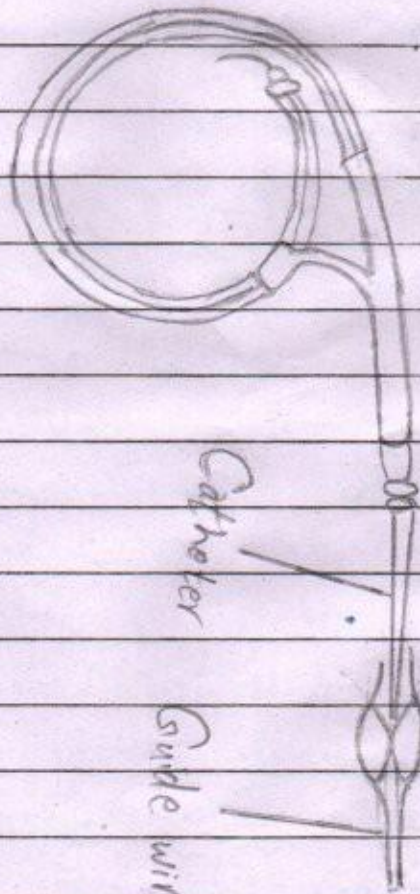
→ A wire or spring used as a guide for placement of large device or prosthesis such as catheter or intracranial pin

→ A guide wire is long flexible fine spring used to introduce and position an intravascular angiographic catheter

→ It is used for the central movement of catheter as it is inserted into the

# Types of Guide wire

- Ribbon wire
- Solid Core wire
- Mandral wire



Catheter

Guide wire

Plaque