



INVESTIGATION OF GENITO- URINARY SYSTEM

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PERCUTANEOUS NEPHROSTOMY
(PCN)

INTRODUCTION

- Interventional procedure
- The introduction of a drainage catheter into the collecting system of the kidney under radiological control .
- May be life saving

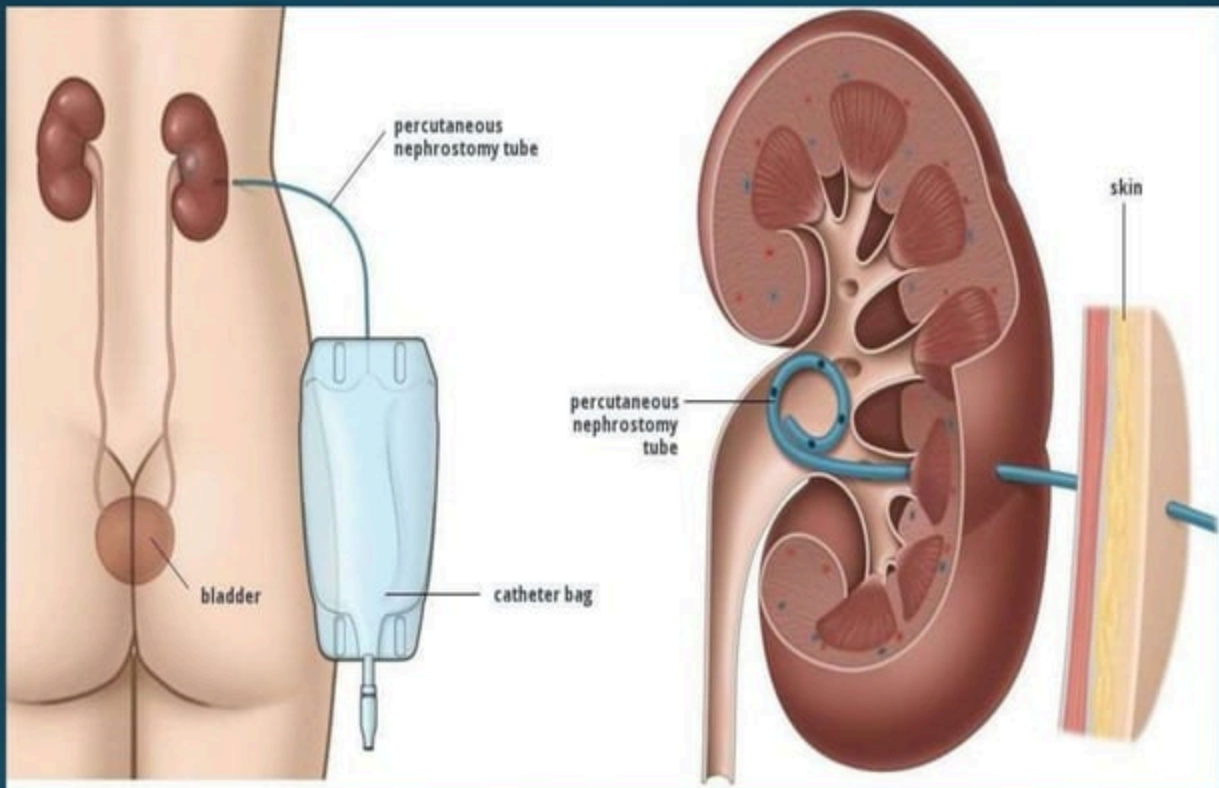


Fig :- PCN

INDICATION

➤ **To relieve renal or ureteric obstruction:**

- Due to calculus, stricture, neoplasm
- Patient with urinary sepsis (pyonephrosis)
- Associated with renal failure

➤ **To provide access to the upper urinary tract:**

- Percutaneous stone removal
- Nephroscopy and biopsy
- Ureteric stent insertion
- Dilatation of ureteric strictures or PUJ obstruction

INDICATION

- **To temporarily divert urine:**
 - In the presence urinary tract leaks and fistulae.

- **To assess recoverable function in a diseased kidney:**
 - When non-invasive tests are unhelpful or unequivocal
 - Response to PCN can decide whether nephrectomy or corrective surgery is appropriate surgery

CONTARINDICATION

➤ **No absolute contraindication for PCN.**

- Uncontrolled bleeding diathesis

➤ **Relative contraindication**

- Coagulopathy (bleeding diathesis) - which should be corrected prior to the procedure
- Uncooperative patient
- Severe respiratory disease

CONTRAST MEDIA

- **To outline the pelvicalyceal system or renal cyst by direct injection into the collecting system**
 - Any HOCM or LOCM 300 mgI/ml.
- *Volume of contrast is dependent on the size of the cyst or collecting system.*
- **Indirect opacification of pelvicalyceal system by intravenous injection**
 - LOCM 350 mgI/ml 50 ml.

EQUIPMENTS

- **USG unit and Fluoroscopy unit**
- **Local anaesthesia**
 - 2% lignocaine
- **Puncturing needle:**
 - Coaxial needle/catheter set or sheathed 18G needle.
- **Drainage catheter:**
 - At least 7-F pigtail with multiple side holes.
- **Guidewires:**
 - Conventional angiographic stiff wire
- **Dilators ranging from 7-9 F**



Fig:- Equipment's For PCN

PATIENT PREPARATION

- Patient should be Nil Per Oral (NPO) for 4-6 hours. i.e. Fasting for 4-6 hours
- Premedication
- Prophylactic antibiotic
- Surgical backup in view of clinical workup, possible complications and further management.

TECHNIQUE

➤ *PATIENT POSITION*

- Patient lie in the prone position on the fluoroscopic table, a foam pad or non-opaque pillow is placed under the abdomen so that the kidney lies in a fixed posterior position.

TECHNIQUE

➤ IDENTIFYING THE COLLECTING SYSTEM

- US may be used to identify the renal collecting system for antegrade pyelography and to determine the plane of definitive puncture of the collecting system.
- Freehand or with a biopsy needle attachment, US may be used to guide the puncturing needle into the collecting system. US guidance is the most common method for localizing the kidney and guiding the initial needle puncture.

TECHNIQUE

➤ *IF US is unavailable following procedure can be performed for identification of collecting system:-*

- **Excretion urography**, if adequate residual function.
- **Antegrade pyelography**

➤ *SITE & PLANE OF PUNCTURE*

- A point on the posterior axillary line is chosen below the 12th rib.
- Having identified the mid/lower pole calyces with US or contrast, the plane of puncture is determined.

TECHNIQUE

➤ TECHNIQUES OF PUNCTURE, CATHETERIZATION

- The skin and soft tissues are infiltrated with local anaesthetic using a spinal needle.
- An 18G sheathed needle, a cyst puncture or a Longdwell needle in conjunction with the Seldinger technique is used for catheterization.
- Upon successful puncture a J-guidewire is inserted and coiled within the collecting system; the sheath is then pushed over the wire, which may be exchanged for a stiffer wire. If possible the guidewire is manipulated into the ureter.

TECHNIQUE

- Dilatation is then performed to 1-F greater than the size of the drainage catheter, which is then inserted.
- During all manipulation, care must be taken not to kink the guidewire within the soft tissues. A substantial amount of guidewire should be maintained within the collecting system so that position is not lost and if kinking does occur, then the kinked portion of the wire can be withdrawn outside the skin.

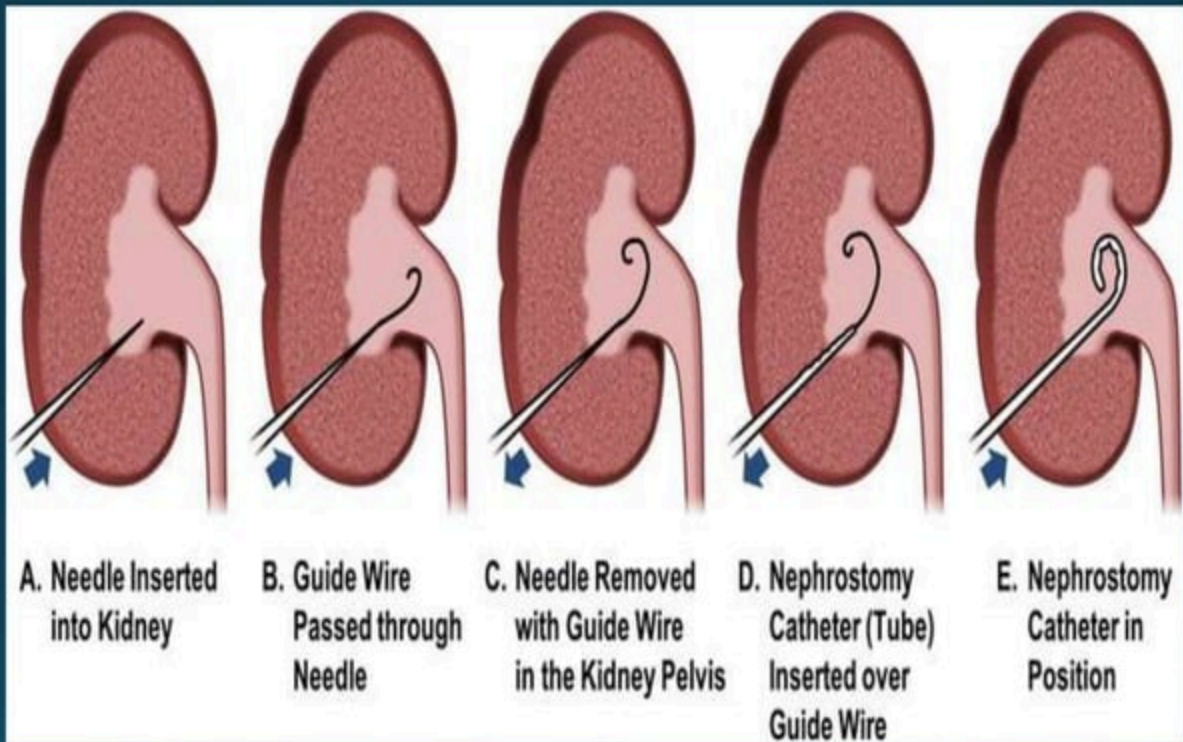


Fig:- Process Of Catheter Placement In PCN



FIG:-Radiographic Figure Of PCN

AFTERCARE

- Bed rest for 6-8 hrs.
- Vital signs monitoring: Pulse, blood pressure and temperature half-hourly for 6 hrs.
- Catheter flushed with saline every 4 hourly
- Adequate analgesia to be provided
- Monitoring of fluid balance/ catheter output
- Urine cultures and sensitivity

COMPLICATION

- Septicemia
- Hemorrhage
- Perforation of the collecting system with urine leak
- Unsuccessful drainage
- Later catheter dislodgement



HYSTEOSALPINGOGRAPHY
(HSG)

INTRODUCTION

- Special type of radiographic contrast study to evaluate female genital tract
- It can be both diagnostic as well as therapeutics procedure.
 - Therapeutics in the sense that blockages in the fallopian tubes are cleared due to force full injection of contrast media.

INDICATION

- **Infertility**
- **Recurrent miscarriages:** Investigation of suspected incompetent cervix, suspected congenital anomaly
- Following tubal surgery
- Post sterilization to confirm obstruction and prior to reversal of sterilization
- Assessment of the integrity of a caesarean uterine scar.

CONTRINDICATION

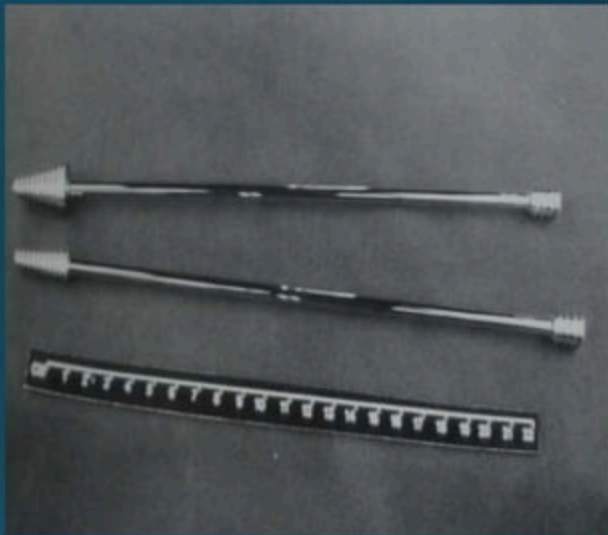
- During menstrual cycle.
- Pregnancy
- A purulent discharge on inspection of the cervix
- Diagnosed pelvic inflammatory disease (PID) in the preceding 6 months
- Contrast sensitivity

CONTRAST MEDIA

- High osmolar contrast material (HOCM) or Low osmolar contrast material (LOCM) 300/350 mgI/ml.
- Volume of contrast :-10–20 ml.

EQUIPMENTS

- Fluoroscopy unit with spot film device
- Vaginal speculum
- Vulsellum forceps
- Uterine cannula, Leech-Wilkinson cannula, olive or 8-F paediatric Foley catheter or hysterosalpingography balloon catheter 5-F or 7-F.



HSG Tray / Equipment Figure's

PATIENT PREPARATION

- HSG is performed between 7-12 days of menstrual cycle and is best scheduled during the 2-5 day interval immediately following the end of menses - **Remember 10 days rule**
- The patient should abstain from intercourse between booking the appointment and the time of the examination.
- Apprehensive patients may need premedication.
- Consent should be obtained.

TECHNIQUE

- The patient lies supine on the table with knees flexed, legs abducted.
- Using aseptic technique the operator inserts a speculum and cleans the vagina and cervix with chlorhexidine.
- The anterior lip of the cervix is steadied and the cannula is inserted into the cervical canal.
- Care must be taken to expel all air bubbles from the syringe and cannula, as these would otherwise cause confusion in interpretation.
- Contrast medium is injected slowly into the uterine cavity under intermittent fluoroscopic control.

FILMS

❖ PRELIMINARY FILM:-

- Coned postero-anterior (PA) view of the pelvic cavity.

❖ Spot Films (Using Under-Couch X-Ray Tube):-

- Early, mid and full uterine filling
- As the tubes begin to fill: isthmic and ampullary phases
- When peritoneal spill has occurred and with all the instruments removed



• Fig:-PERITONEAL SPILLAGE



• Fig:-EARLY FILLING PHASE

Fig:- Spot Film Of HSG



• Fig:- TUBAL FILLING PHASE

AFTERCARE

- It must be ensured that the patient is in no serious discomfort nor has significant bleeding before she leaves.
- The patient must be advised that she may have bleeding per vaginam for 1–2 days and pain may persist for up to 2 weeks.
- Prophylactic antibiotics should be given for at-risk groups, e.g. hydrosalpinx or tubal adhesions.

COMPLICATIONS

➤ DUE TO THE CONTRAST MEDIUM:-

- Allergic phenomena – especially if contrast medium is forced into the circulation.

➤ 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 distension proximal to a block
 - d) With distension of the uterus if there is tubal spasm
 - e) With peritoneal irritation during the following day, and upto 2 weeks.

COMPLICATIONS

2. Bleeding from trauma to the uterus or cervix.
3. Transient nausea, vomiting and headache.
4. Intravasation of contrast medium into the venous system of the uterus
5. Infection – which may be delayed. Occurs in up to 2% of patients and more likely when there is a previous history of pelvic infection.
6. Abortion – The operator must ensure that the patient is not pregnant.

THANK YOU