

Fig. 4.125: IVU X-ray showing bilateral complete duplex kidney.

Treatment:

- Ureteric meatotomy is done if there is narrowing of the orifice.
- Co-existing complications are treated.
- Often heminephrectomy, including removal of corresponding ureter may be essential as treatment.

Retrocaval Ureter

- It is due to developmental defect of IVC, as a result of which ureter passes behind the IVC, causing right sided hydronephrosis with upper third hydroureter.
- IVU shows hydronephrosis with 'reverse J sign.'
- Treatment: Anderson Hynes' operation.



Fig. 4.126: IVU showing reverse 'J' sign—feature of retrocaval ureter.

Ureterocele

- It is a cystic enlargement of the intra mural portion of ureter due to congenital atresia of the ureteric orifice. Its wall contains mucous membrane only.

Location of Renal Pelvis

Most common congenital anomaly of the upper urinary tract (4%).

Usually unilateral. Common on the left side. 2% of cases it is associated with duplication of ureter. Upper renal pelvis is small, drains upper calyces. Lower renal pelvis is larger, drains from middle and lower calyces.

When associated with double ureter, it may be *partial* where two ureters join in lower part or *complete* where upper ureter opens into the bladder at a lower level and lower ureter opens into the bladder at the upper normal ureteric orifice. This is called as 'Robert-Meyer Law.'

In *partial duplex*, there is reno-renal reflux resulting in infection, stone formation and hydronephrosis.

Diagnosis: IVU is diagnostic. Ultrasound is used to look for complications. Cystoscopy shows two ureteric orifices on the same side.

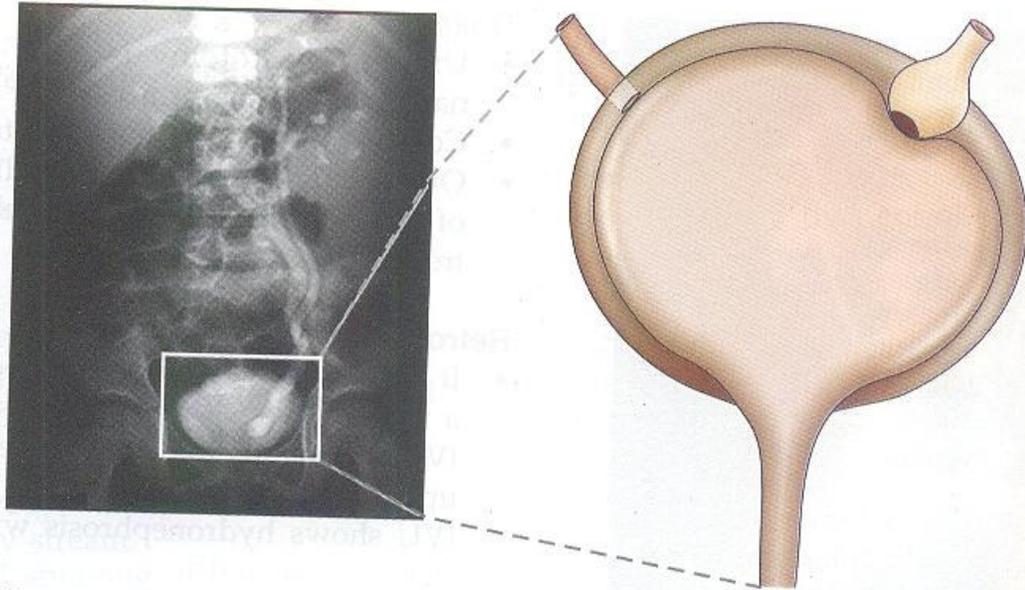


Fig. 4.127: IVU reveals left sided ureterocele with duplex kidney. Note the characteristic *Cobra (Adder) head* pattern of left ureterocele. One can observe left sided double ureter-complete type.

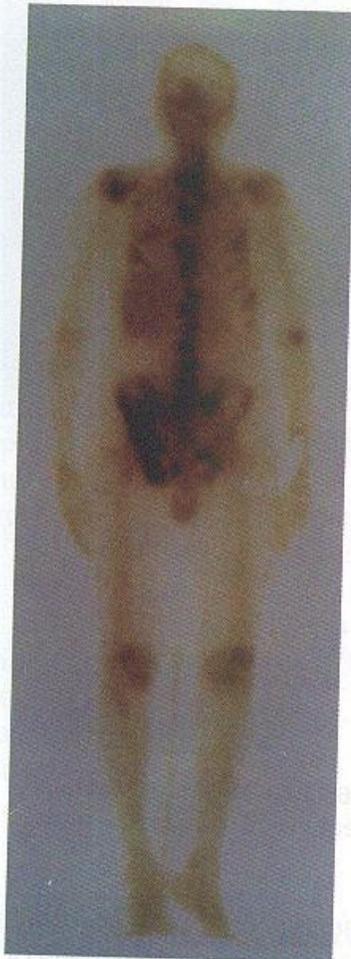


Fig. 4.128: Radioisotope bone scan showing skeletal metastases-primary is from prostate.

- It is common in females, and often it is bilateral (10%).
- It causes hydronephrosis, infection, calculi formation.
- *Stephen classification:* Stenotic, sphincter, sphinctero-stenotic.
- Investigations: IVU-shows *Adder-head* appearance or *cobra head* appearance. Cystoscopy - shows translucent cyst which is thin walled surrounding the ureteric orifice.
- Treatment: *Cystoscopic ureteric meatotomy* with the removal of cyst wall. In addition, any existing complications like stone, obstruction, infection should be treated.

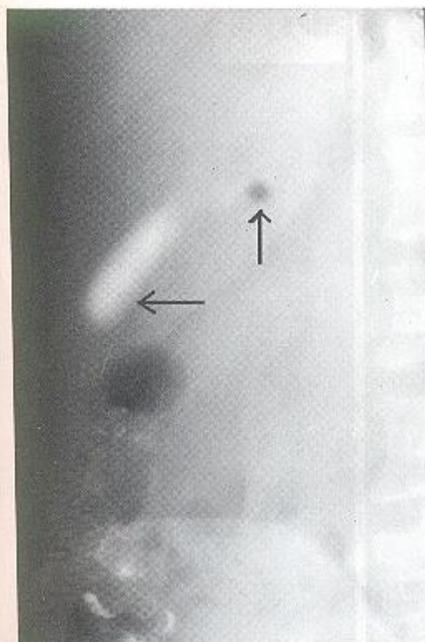
ORAL CHOLECYSTOGRAM (OCG) GRAHAM-COLE TEST

Patient is advised to have fat free diet for 3 days. Previous night 6 tablets of *iopanoic acid* (Telepaque) is given orally. Next morning plain X-ray abdomen is taken to visualise the gall bladder.

Later fatty meal is given and X-rays at 15, 30 and 60 minutes are taken to see the change in the size of the gall bladder (which should

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4.129: Oral cholecystogram with smooth filling defect (Cystic duct stone).



4.130: OCG done to see the function of the gallbladder.

less in size compared to the earlier film, as gall bladder contracts on stimulation if it is functioning normally). Smooth filling defect indicates non-opaque stone.

Indications: Patients with serum bilirubin $>3\text{mg}\%$, acute cholecystitis.

OCG is not done now.

IV Cholangiograms

It is done to visualise bile ducts and biliary tree, by injecting IV *Meglumine ioglycamate* (Biligram) and taking X-Ray abdomen. It can be combined with OCG.

Problems with this method are poor visualisation, drug reaction. It is not very useful if serum bilirubin is $>3\text{mg}\%$.

ERCP (Endoscopic Retrograde Cholangio Pancreatography)

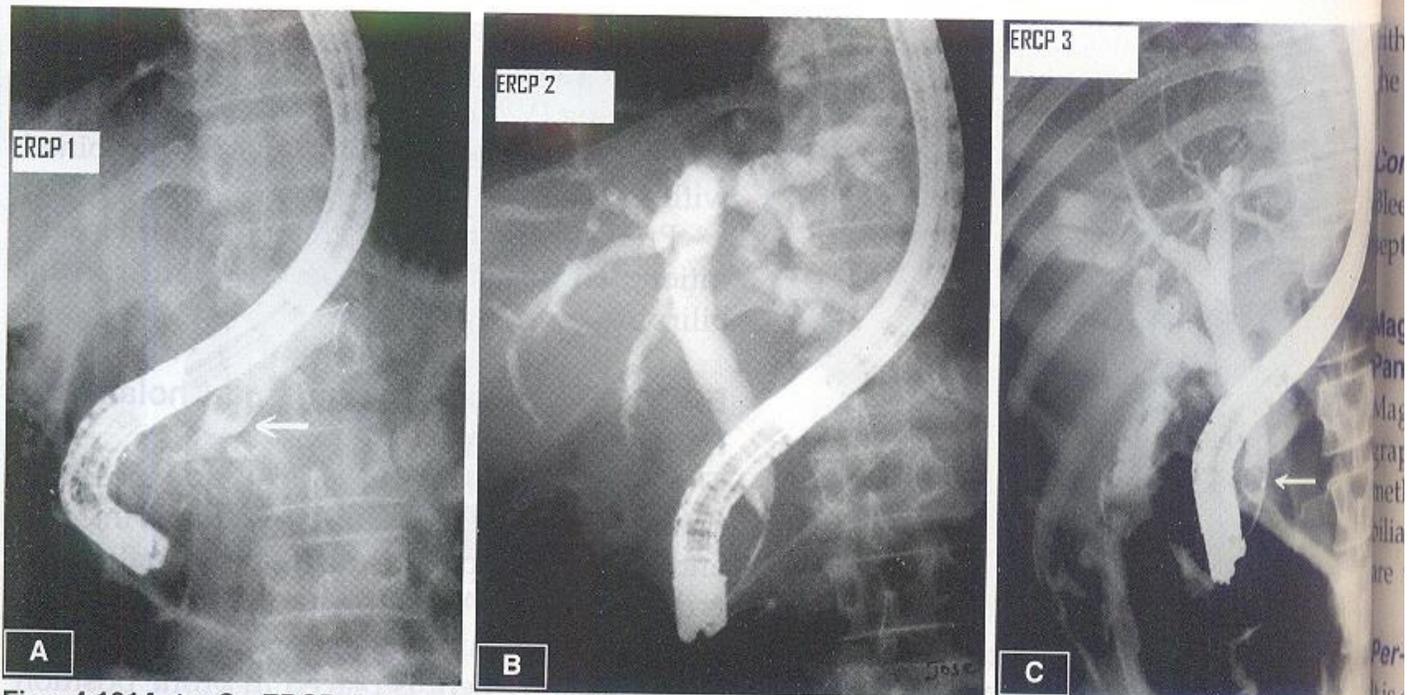
Through a side viewing gastro duodenoscope, sphincter of Oddi is cannulated, dye is injected and biliary and pancreatic tree is visualised. It is done under C-ARM guidance. It is done under sedation like midazolam or using propofol anaesthesia. Patient is placed in prone position with the head turned towards right. After passing gastroduodenoscope, sphincter is identified and cannulated. Under visualisation 3 ml of water soluble iodine contrast, is injected into the bile duct and pancreatic duct. When cannula goes upwards beside vertebra, it is in bile duct; and if cannula goes across the vertebra it is in pancreatic duct.

Indications

- Malignancy: irregular filling defect.
- Chronic pancreatitis - chain-of-lakes appearance.
- Congenital anomalies, stones.
- Stricture of biliary tree.
- Choledochal cyst.
- For sampling of biliary and pancreatic juices for analysis and cytology.
- Brush biopsy from tumour site.

Therapeutic uses

- Extraction of biliary duct stone.
- Nasobiliary drainage.
- Stenting of tumour in the CBD or in the pancreas.
- Dilatation of the biliary stricture.
- Endoscopic papillotomy.



Figs 4.131A to C: ERCP being done. Note the gastroduodenoscope with injection of dye. Finding in ERCP 1 is filling defect in the CBD. In ERCP 2 there is dilatation of biliary radicles. In ERCP 3 there is radiolucent filling defect (smooth filling defect) in distal CBD which can be removed through ERCP. Antibiotics should be given to prevent cholangitis.

Complications

- Pancreatitis.
- Duodenal injury.
- Cholangitis
- Bleeding

Relative contraindications

- Acute pancreatitis.
- Previous gastrectomy.
- Altered prothrombin time (corrected by injection Vitamin K, FFP).
- Bleeding disorders.

Percutaneous-Transhepatic Cholangiography (PTC)

It is done in case of severe obstructive jaundice under coverage of appropriate antibiotics and after control of any bleeding tendency.

With the help of fluoroscopy, *Chiba* or *Oxley* needle which is long, flexible, thin, blunt, without beveled end, is passed into the liver through right 8th intercostal space in mid axillary line. Once needle is in the dilated biliary radicle, bile is aspirated (sent for culture, cytology, analysis) and then water soluble iodine dye is injected into the same so as to visualise the dilated biliary radicles, also the site and extent of any obstruction. (I.e. tumour, stricture).

Procedure can be used for therapeutic stenting across the biliary tree through any obstruction



Fig. 4.132: ERCP picture showing CBD stents.