Surgery Of Biliary system (2)

By

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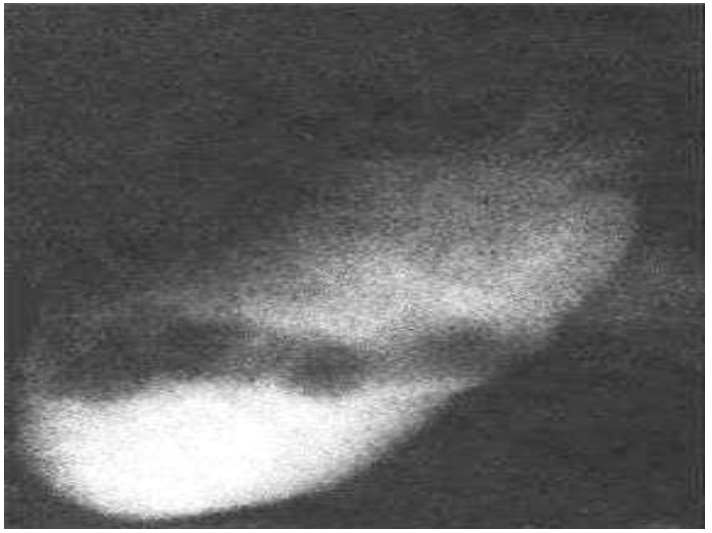
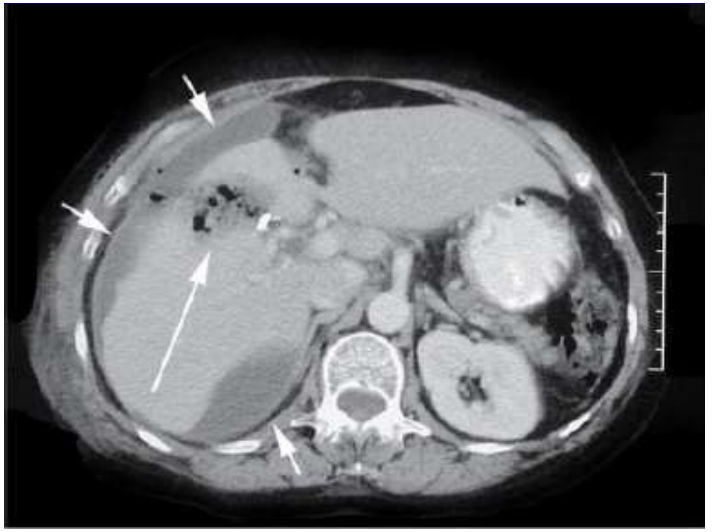
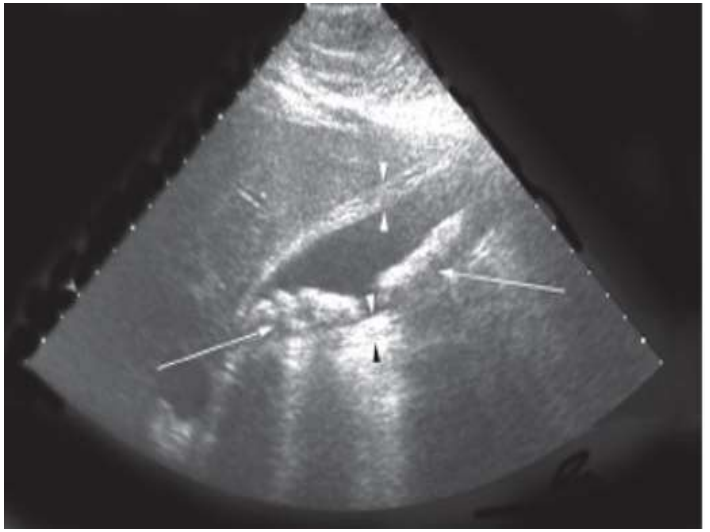
Summary box 63.1

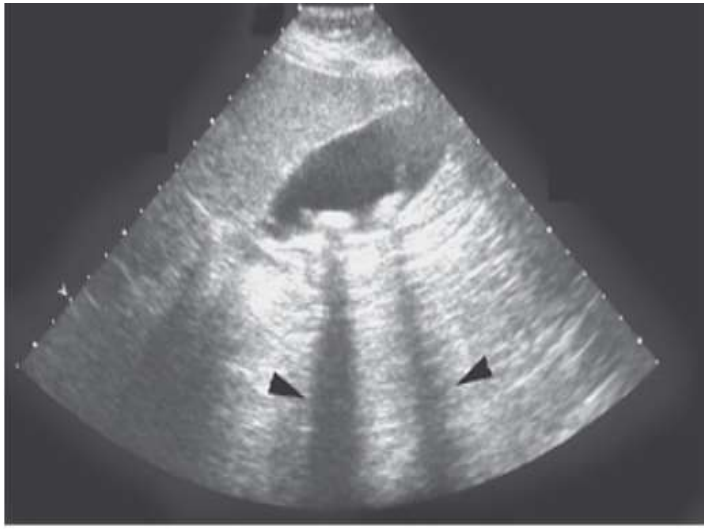
Investigation of the biliary tree

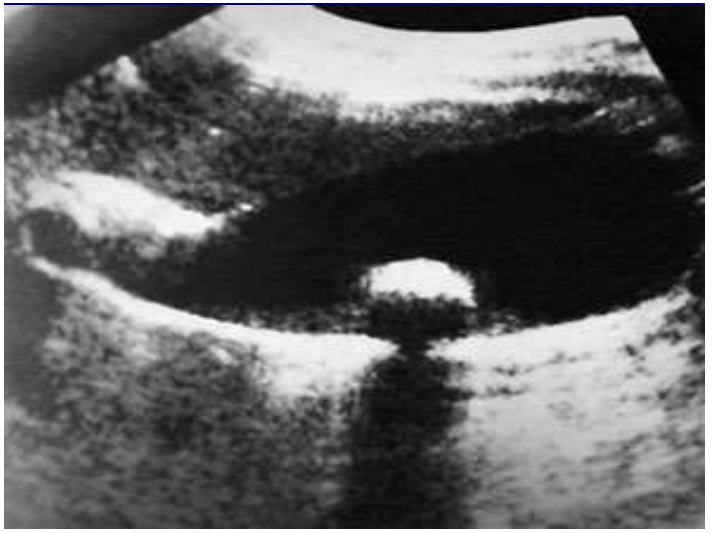
- Ultrasound: stones and biliary dilatation
- Plain radiograph: calcification
- Magnetic resonance cholangiopancreatography: anatomy and stones
- Multidetector row computerised tomography scan: anatomy, liver, gall bladder and pancreas cancer
- Radioisotope scanning: function
- Endoscopic retrograde cholangiopancreatography: anatomy, stones and biliary strictures
- Percutaneous transhepatic cholangiography: anatomy and biliary strictures
- Endoscopic ultrasound: anatomy and stones

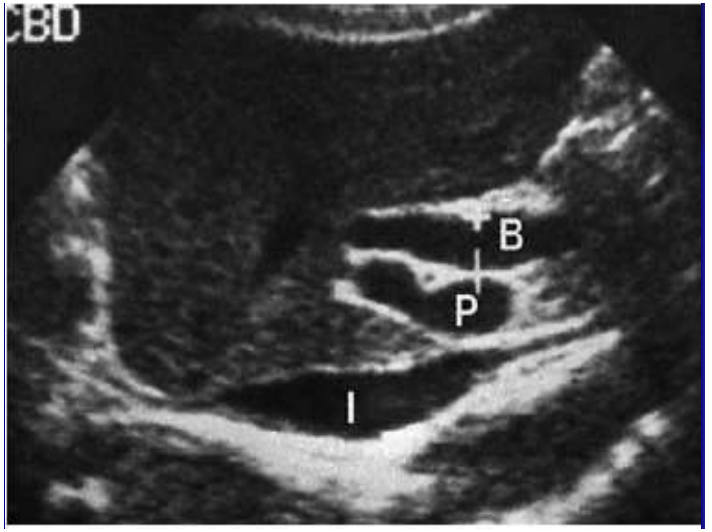








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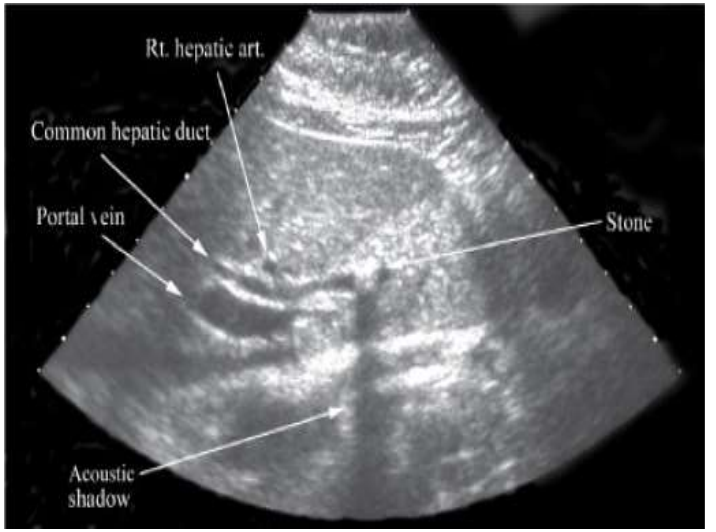
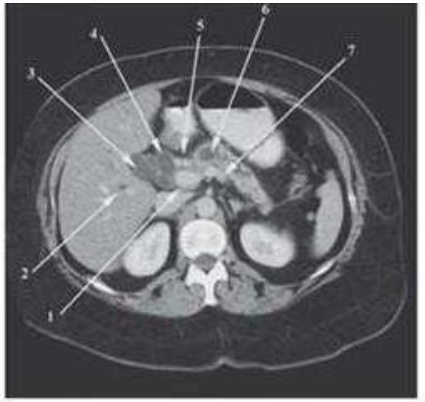

Rt. hepatic art.
Common hepatic duct
Portal vein
Stone
Acoustic shadow



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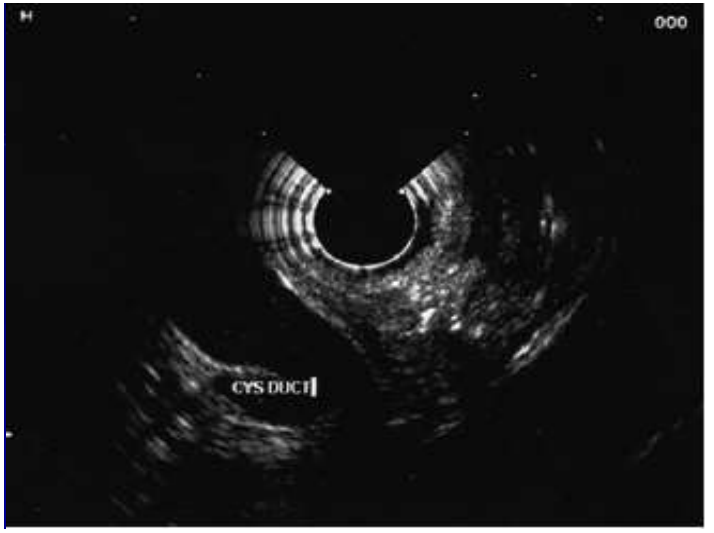
Computed tomography scan of the upper abdomen from a patient with cancer of the distal common bile duct. The cancer obstructs the common bile duct as well as the pancreatic duct. 1 = the portal vein; 2 = a dilated intrahepatic bile duct; 3 = dilated cystic duct and the neck of the gallbladder; 4 = dilated common hepatic duct; 5 = the bifurcation of the common hepatic artery into the gastroduodenal artery and the proper hepatic artery; 6 = dilated pancreatic duct; 7 = the splenic vein.



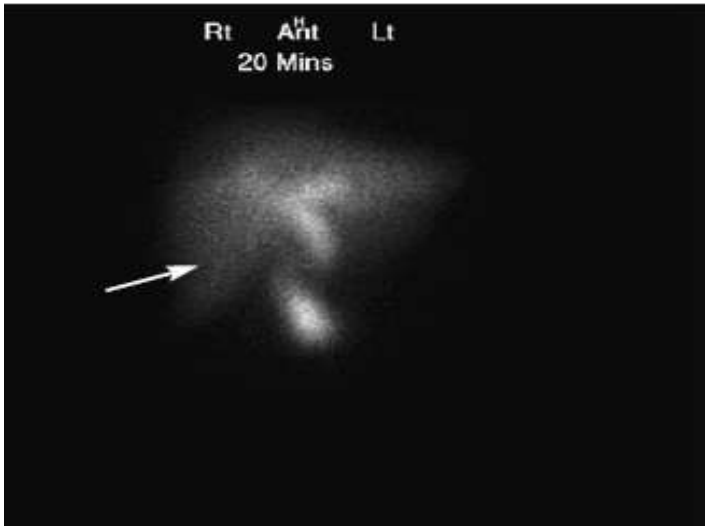
Radioisotope scanning

Method

^{99m}Tc labelled derivative of iminodiacetic acid (HIDA) is injected LV. The isotope is rapidly excreted by the liver to visualize the biliary tree.

Uses

- Diagnosis of acute cholecystitis. Non-visualization of the gall bladder indicates obstruction of its neck and supports the diagnosis. A gall bladder that fills by the isotope excludes it (Fig. 32.8).
- Diagnosis of congenital biliary atresia.
- To visualize a biliary enteric anastomosis.



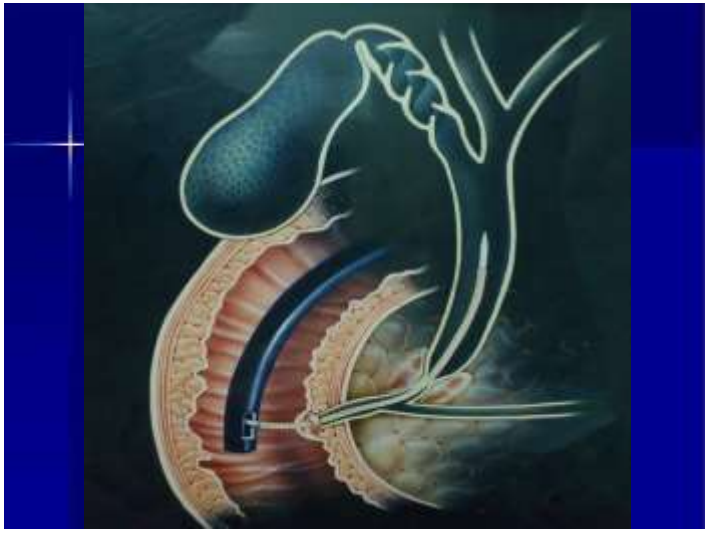
Indications

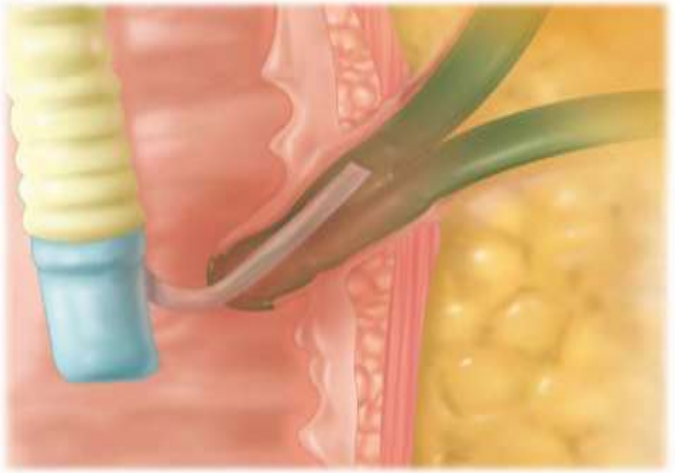
ERCP is very valuable in the following situations

- Diagnosis of lesions involving the lower end of CBD as carcinoma of head of pancreas or ampulla of Vater. A biopsy can be taken from an ampullary lesion (Fig. 32.6).
- Detection of missed calculi in the CBD after cholecystectomy.
- Detection of operative injuries of the biliary system.
- Visualization of the pancreatic duct in patients with chronic pancreatitis or pancreatic pseudocyst.
- Therapeutic procedures can be performed with ERCP, e.g.,
  - Sphincterotomy and removal of bile duct stones.
  - Insertion of a stent to drain malignant obstruction of the duct.

Complications

In the presence of unrelieved obstruction in the CBD, injection of the contrast material may lead to cholangitis or even to septicaemia due to increased pressure in of the CBD. Acute pancreatitis or duodenal perforation may occur.





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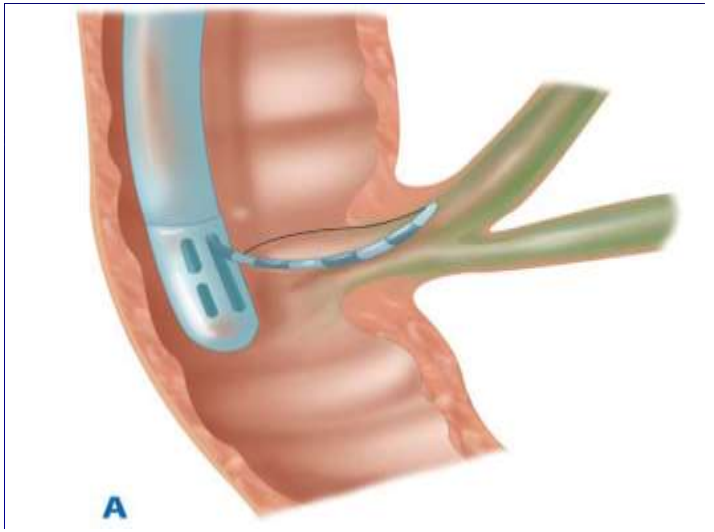

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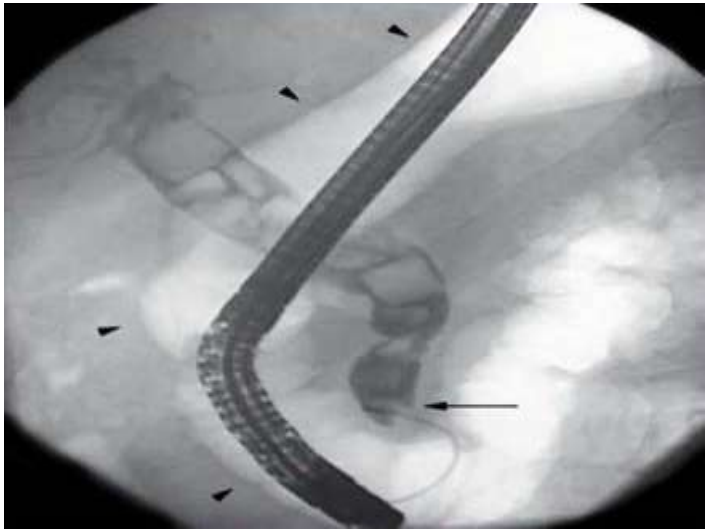
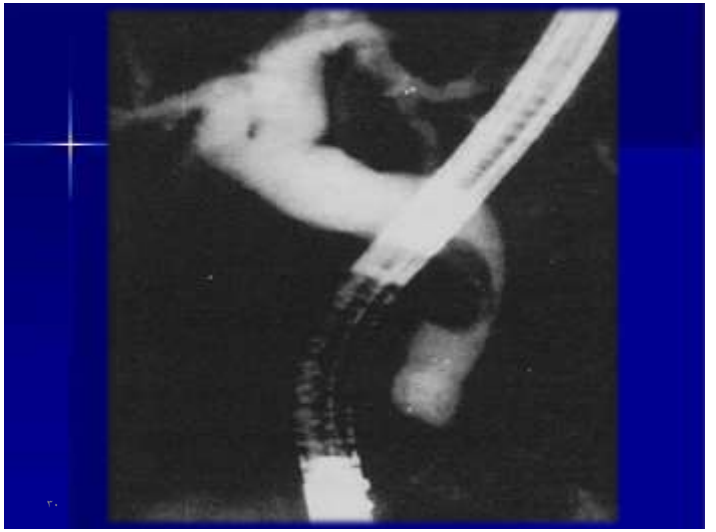




Percutaneous transhepatic cholangiography (PTC)

Pre-requisites

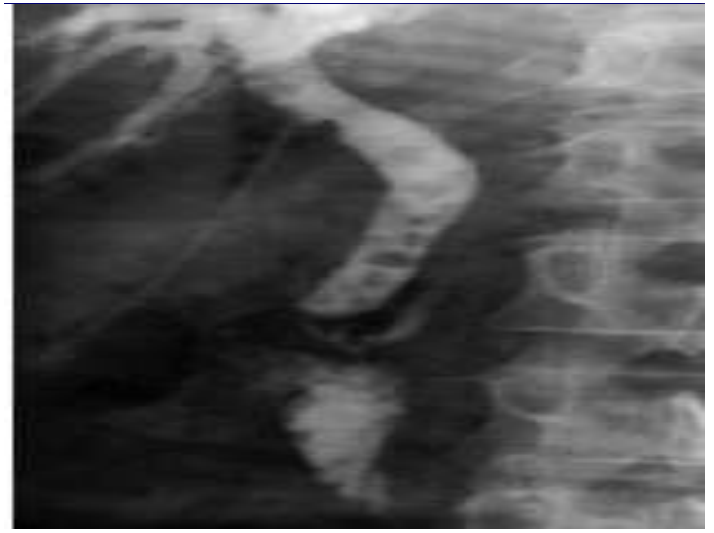
1. Normal coagulation. The prothrombin time (PT) and concentration are checked. If PT is prolonged, vitamin K is given I.V for a few days to correct hypo-prothrombinaemia before the procedure.
2. Dilated intrahepatic biliary radicles, as seen on ultrasound.

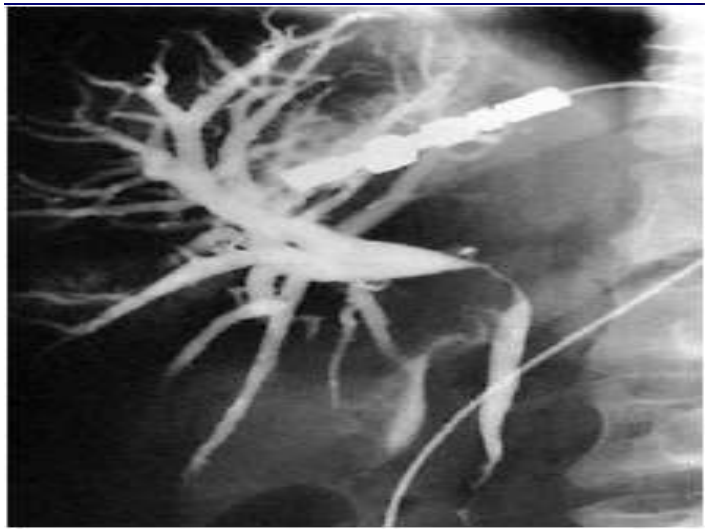
Technique (Fig. 32.7)

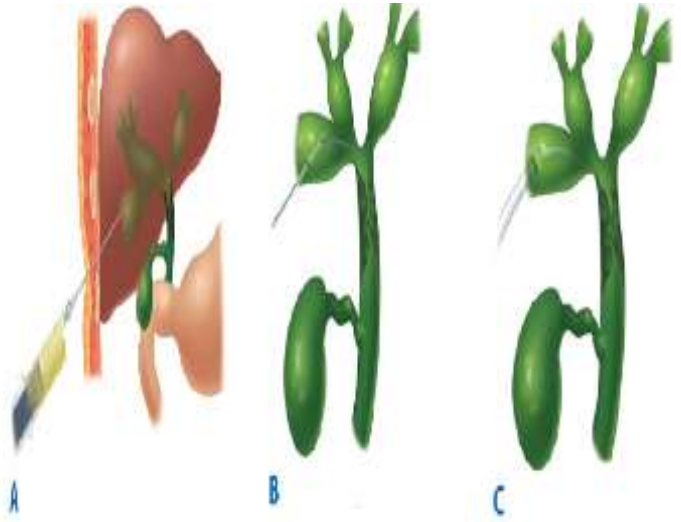
Under local anaesthesia, a thin cannula (Chiba needle) is introduced through the 8th intercostal space into the liver and continuous suction by a syringe is applied until bile is aspirated and the dye is then injected. The dye will visualize the intrahepatic biliary ducts and then it will flow to the bile duct from above downwards.

Indications

PTC is particularly indicated to diagnose high obstruction of bile ducts as in post-operative biliary strictures or in hilar cholangiocarcinoma.



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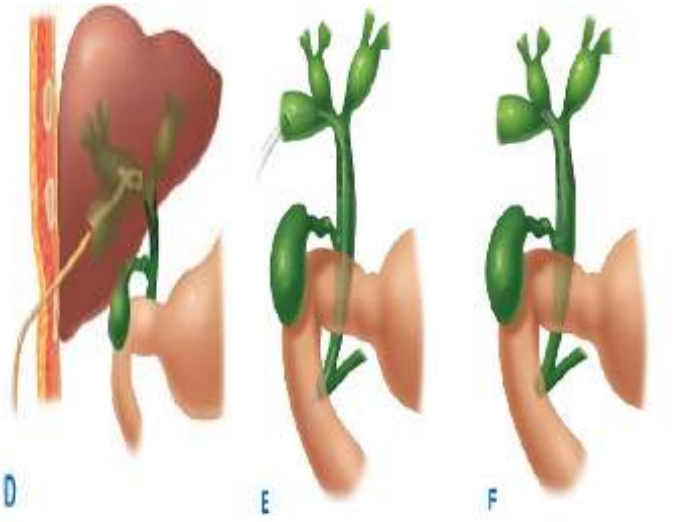
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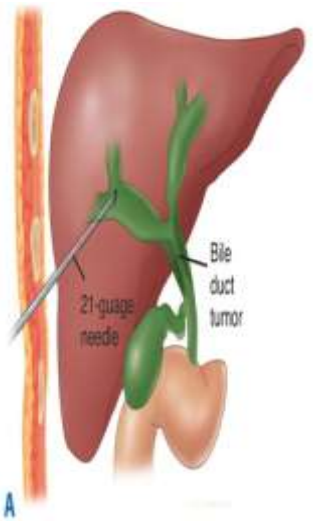

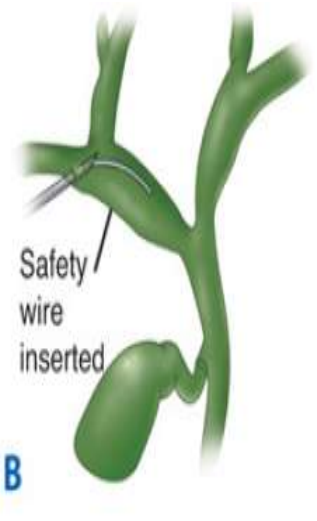

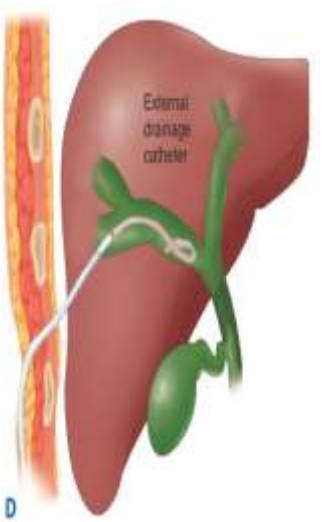

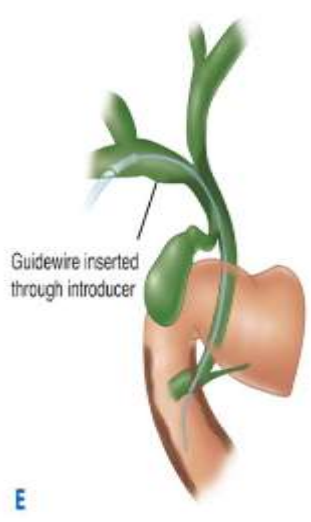

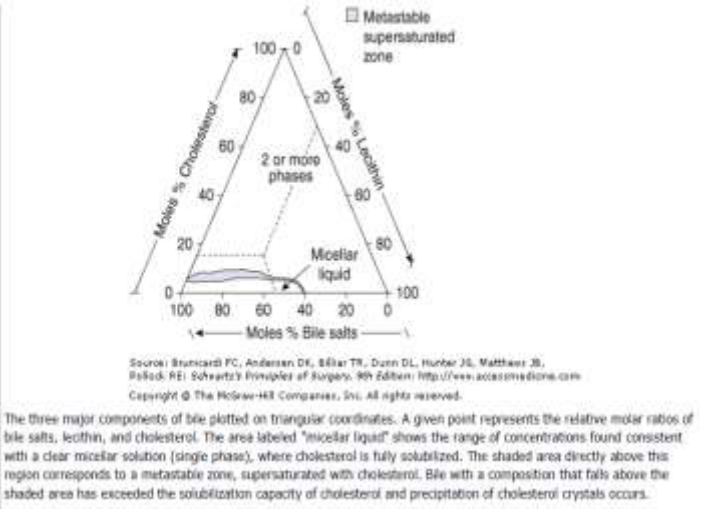

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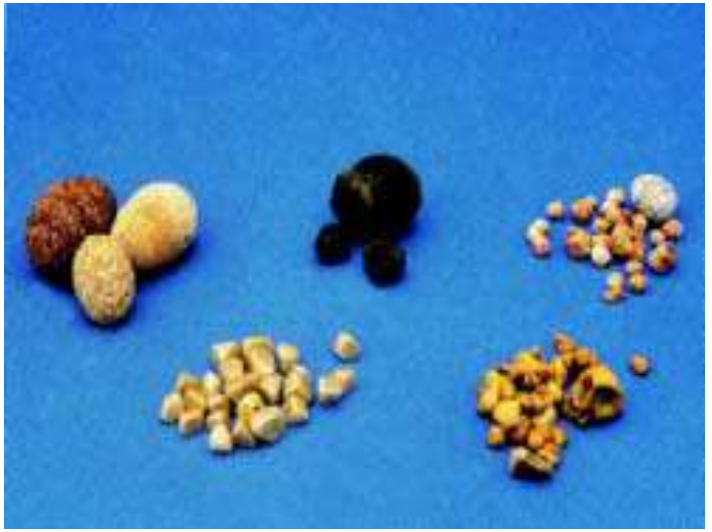
The three major components of bile plotted on triangular coordinates. A given point represents the relative molar ratios of bile salts, lecithin, and cholesterol. The area labeled "micellar liquid" shows the range of concentrations found consistent with a clear micellar solution (single phase), where cholesterol is fully solubilized. The shaded area directly above this region corresponds to a metastable zone, supersaturated with cholesterol. Bile with a composition that falls above the shaded area has exceeded the solubilization capacity of cholesterol and precipitation of cholesterol crystals occurs.



Box 1.1 Risk factors associated with formation of cholesterol gall stones

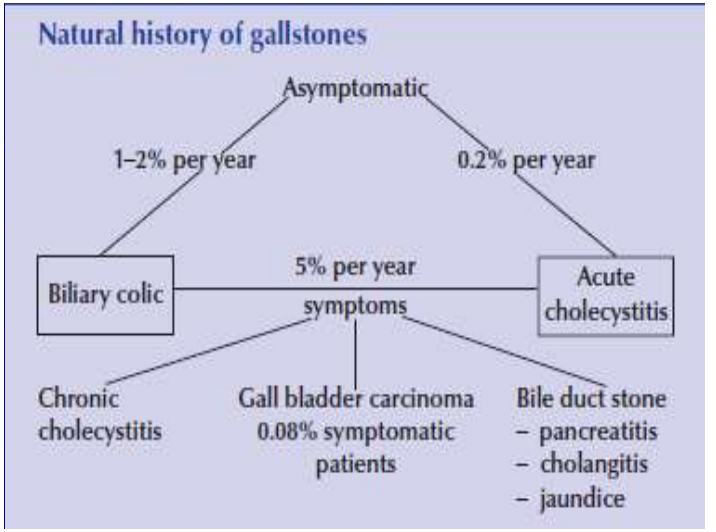
- Age >40 years
- Female sex (twice risk in men)
- Genetic or ethnic variation
- High fat, low fibre diet
- Obesity
- Pregnancy (risk increases with number of pregnancies)
- Hyperlipidaemia
- Bile salt loss (ileal disease or resection)
- Diabetes mellitus
- Cystic fibrosis
- Antihyperlipidaemic drugs (clofibrate)
- Gallbladder dysmotility
- Prolonged fasting
- Total parenteral nutrition

Box 1.3 Charcot's triad of symptoms in severe cholangitis

- Pain in right upper quadrant
- Jaundice
- High swinging fever with rigors and chills

Box 1.2 Differential diagnosis of common causes of severe acute epigastric pain

- Biliary colic
- Peptic ulcer disease
- Oesophageal spasm
- Myocardial infarction
- Acute pancreatitis



Differential diagnosis of cholecystitis

Common
- Appendicitis
- Perforated peptic ulcer
- Acute pancreatitis

Uncommon
- Acute pyelonephritis
- Myocardial infarction
- Pneumonia – right lower lobe

Ultrasound scan aids diagnosis

Uncertain diagnosis – do CT scan

Effects and complications of gallstones

In the gallbladder
- Biliary colic
- Acute cholecystitis
- Chronic cholecystitis
- Empyema of the gall bladder
- Mucocele
- Perforation

In the bile ducts
- Biliary obstruction
- Acute cholangitis
- Acute pancreatitis

In the intestine
- Intestinal obstruction (gallstone ileus)

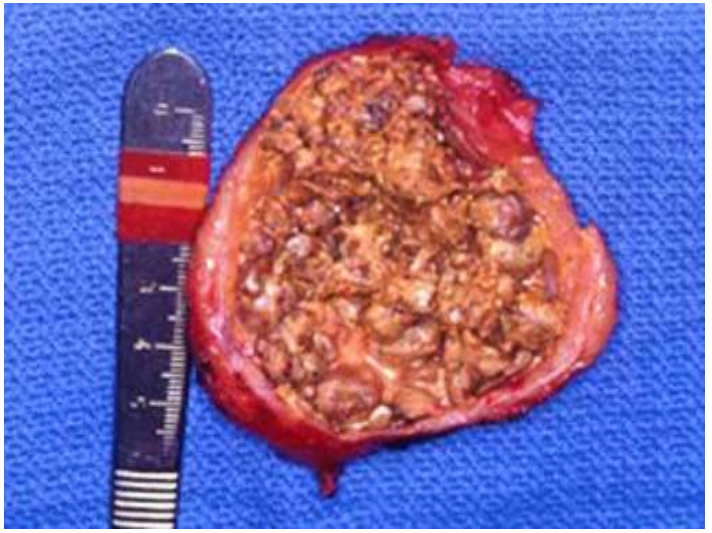


Figure 63.28 The interior of a strawberry gall bladder (cholesterosis)

- Surgical anatomy
- Surgical physiology
- Imaging investigations
- Congenital anomalies
- Gall stones
- Acute cholecystitis