

Epidemiology

- 10-15% Western adults.
- ~65% asymptomatic with 1-4% becoming symptomatic per year (↑with smoking and parity)
- Commonest presentations are biliary colic (56%) and acute cholecystitis (36%), also chronic cholecystitis, pancreatitis or obstructive jaundice.

Risk factors

- 'Fair, fat, fertile, female and forty'
- Increasing age
- Positive family history
- Haemolysis (e.g. sickle cell anaemia, hereditary spherocytosis, thalassaemia)
- Sudden weight loss (e.g. after obesity surgery)
- Loss of bile salts (e.g. ileal resection, terminal ileitis)
- DM (as part of the metabolic syndrome)

Types of stone

Bile contains cholesterol, bile pigments and phospholipids. Overall 10-20% radiopaque.

- *Cholesterol stones* (~75%): large (5-25mm), often solitary. Radiolucent.
- *Black pigment stones*: small (2-5mm), friable, irregular. Often radiopaque
- *Mixed stones*: faceted, comprised of Ca salts, pigment and cholesterol. 10% radiopaque.
- *Brown pigment stones* (<5%): 2° to biliary stasis/infection (E.Coli, Klebsiella). Radiolucent.

Biliary Colic

Commonest presentation, caused by gallstone impaction in cystic duct or the ampulla of Vater.

History: Sudden onset of constant (not colicky) epigastric/RUQ pain ± radiation to back/interscapular region. N & V. Often following meals, esp fatty ones.

Exam: Afebrile, RUQ tenderness, jaundice if common bile duct stone.

Acute cholecystitis

Caused by prolonged biliary colic, stones in GB & blocking cystic duct. Rarely acalculus cholecystitis. Repeated attacks can → chronic cholecystitis & GB walls become thickened and scarred, and the GB shrivels.

History: As for biliary colic + often radiation to R scapular (Boas' sign). Systemically unwell.

Exam: Commonly febrile, RUQ guarding + rebound + positive Murphy's sign, ±gallbladder mass. Jaundice may occur if stone passes into bile duct and obstructs it.

Choledocholithiasis/Obstructive jaundice

Stone migration from GB into CBD or, less commonly, when fibrosis and impaction of a large stone in Hartmann's pouch compresses the common hepatic duct (Mirrizi's syndrome). Jaundice ± biliary colic. Conjugated bilirubin is water soluble → dark urine and as less enters gut → pale stools and an absence of urobilinogen in the urine.

Cholangitis

An obstructed CBD becomes infected. In severe cases, symptoms can include pain in RUQ, jaundice, and high swinging fevers with rigors and chills (Charcot's triad).

Pancreatitis

Gallstone temporarily blocks biliopancreatic duct → premature release of pancreatic enzymes. See Acute Pancreatitis article.

Empyema

The obstructed gallbladder fills with pus. The patient may become quite toxic, and there is a marked fever and leucocytosis.

Gallstone ileus

A stone perforates the GB, ulcerating into the duodenum. It may → obstruct the adjacent jejunum or terminal ileum. Subsequent inflammation may result in a fistula between these structures and the passage of a gallstone into the bowel.

Investigations

Urine: urine - ?bilirubinuria - obstructive jaundice.

Bloods: FBC, UEC, LFT, lipase/amylase ± Trop/CK

ECG: to r/o ACS.

Imaging: USS (90-95% sensitive for gallstones, >80% sens & spec for cholecystitis, dilation biliary tree, occ pancreatitis). AXR may show calcified gallstone (minority). ERCP for duct stones. CT (95% sens may be useful for Dx & DDX). MRI cholangiography not widely avail.

Special: HIDA scan - IV radionuclide that concentrates in bile. If not concentrated in GB within 4hrs suggests a cystic duct obstruction.

Management of biliary colic and cholecystitis

Biliary colic

- Analgesia (opioids, risk of sphincter of Oddi spasm with **morphine** appears insignificant)
- ERCP±sphincterotomy if evidence of ductal stone.

Acute cholecystitis

- NBM, IVF ± anti-emetic
- IV ABx 1g **ampicillin** q6h + **gentamicin** 4-6mg/kg od + **metronidazole** 500mg bd

Surgical

- Laparoscopic cholecystectomy is preferred procedure.
- Urgent op if perforation, gallstone ileus, empyema or acalculus cholecystitis.
- Early surgery (within seven days of the onset of symptoms) appears to be safe and shortens hospital stay, but further studies are needed.
- Percutaneous cholecystotomy (surgical drainage of the gallbladder) is useful for patients who are unfit for cholecystectomy.

Management of cholelithiasis

- ERCP + laparoscopic cholecystectomy

Management of cholangitis

- IV Abx as for cholecystitis
- Correction of fluid/electrolyte disturbance.
- Surgical decompression of the gallbladder
- Endoscopic drainage preferred now to emergency surgical common duct exploration and T-tube drainage
- Percutaneous transhepatic biliary drainage (PTBD) is another option.

Prevention

- Ursodeoxycholic acid is useful in preventing gallstone formation in high-risk patients