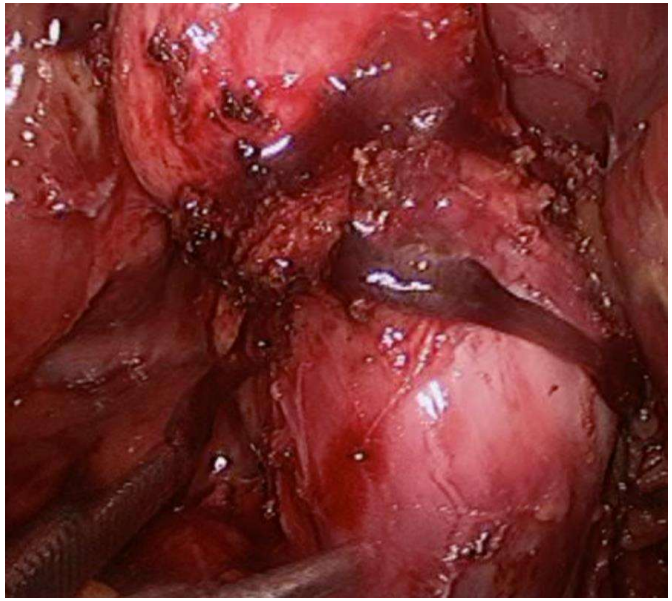
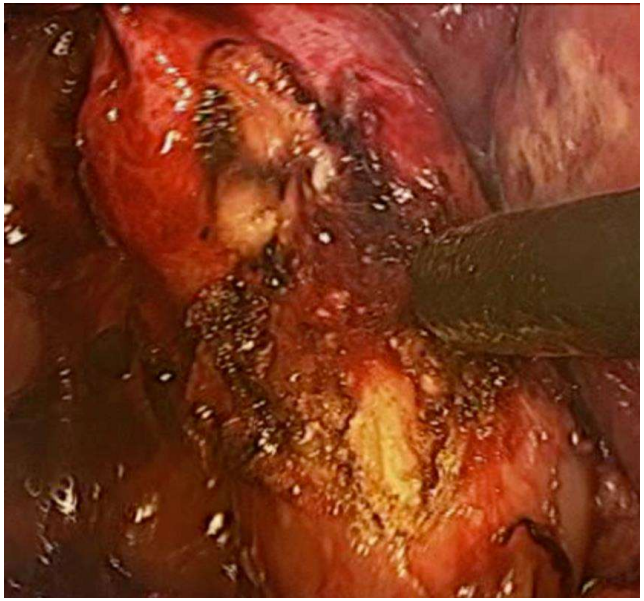
Mirizzi

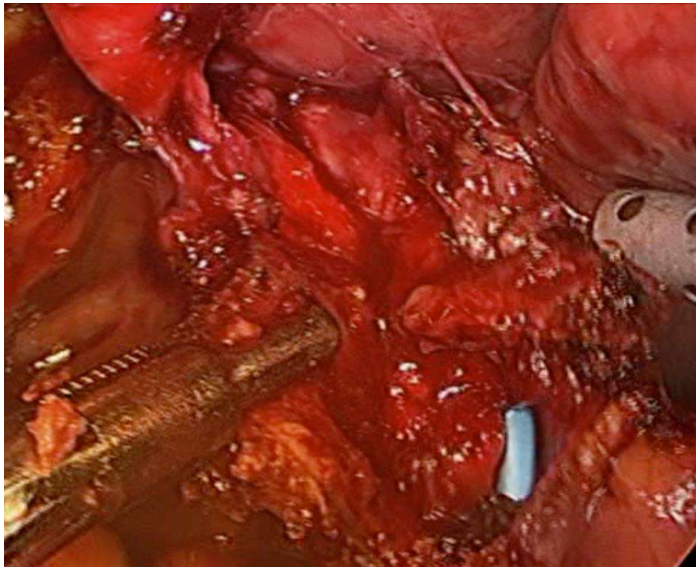
- Obstruction of common bile duct due to stone chronically impacted in Hartmann's pouch +/- erosion into bile duct
- 0.3-3% of cholecystectomies
- Present with jaundice/cholangitis +/- typical biliary pain
- Treat first with ERCP and stenting
- Risk of harbouring GB cancer up to 25%
- Surgical treatment ranging from subtotal cholecystectomy to fistula closure to Roux-en-Y hepaticojejunostomy

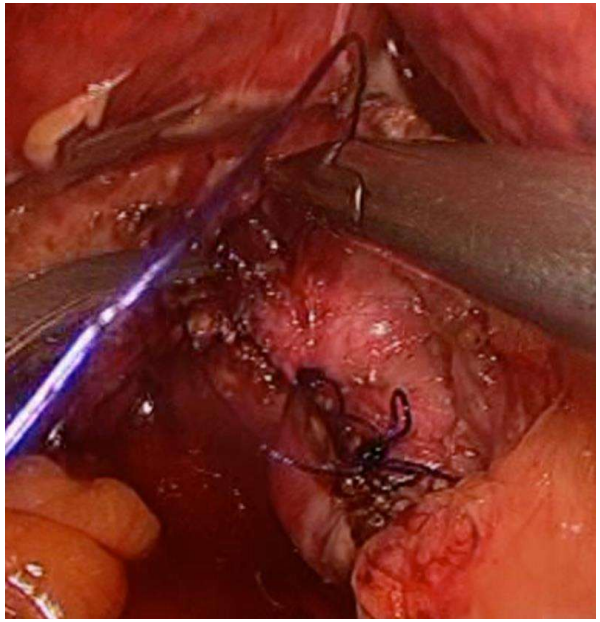
Pathology	Chronic cholecystitis	External compression of common hepatic duct	Cholecystocholedochal fistula		
Stages					
Classification of McSherry *et al.*[16]		Type I	Type II		
Classification of Csendes *et al.*[1]		Type I	Type II	Type III	Type IV

Mirizzi









Special Scenarios

Acalculous cholecystitis

- Ischaemic
  - Most common in elderly or comorbid patients in hospital with other critical illness
  - Usually treat with percutaneous drainage
  - Most probably do not need cholecystectomy
- Dysfunctional gallbladder (dyskinesia)
  - Chronic, biliary-colic type symptoms, but no stones
  - Difficult to diagnose - consider HIDA scan with CCK to measure GB ejection fraction
  - Consider cholecystectomy if no other cause of pain found but success rate much lower than typical gallstone (around 50%?)

Gallstones in Pregnancy

- Increase bile cholesterol and reduced bile salts
- Reduced GB motility
- About 10% pregnant women develop gallstones
- Increased risk if obese
- After pregnancy, most sludge disappear by 1 year, but only 20% stones disappear
- Asymptomatic patients manage same as non-pregnant

Gallstones in Pregnancy

- Treatment of symptomatic gallstones
  - Laparoscopic cholecystectomy seems safe in all trimesters including first and late third trimester
  - For symptomatic patients, cholecystectomy has lower rates of complications compared with non-surgical management
    - one study showed 5% with surgery vs 16% without surgery for both mother and fetus
  - Biliary colic
    - most can be managed non-operatively
    - for severe recurrent or intractable pain consider surgery
    - post-partum high chance of recurrent pain
  - Acute cholecystitis - early surgery
  - CBD stones - can be managed safely with ERCP with fetal shielding. In most cases should be followed by lap chole. Alternative is lap chole and intra-operative bile duct exploration
  - Pancreatitis due to stones can be managed same as non-pregnant patients with index cholecystectomy, unless near term (ok to delay until after delivery)

Gallstones in bariatric patients

- Gallstones and symptomatic gallstones more common in obese patients
- Also more common with rapid weight loss eg after bariatric surgery
- Surgery can be more technically challenging
- CBD stones particularly challenging to manage
  - Roux-Y gastric bypass often makes ERCP impossible
  - Options include surgical bile duct exploration, laparoscopic assisted ERCP, and EUS/AXIOS assisted ERCP
- Prophylactic cholecystectomy during bariatric operation controversial and not routinely done by most surgeons

Adenomyomatosis

- Thickening of GB wall with epithelial and smooth muscle hyperplasia and development of sinuses that trap bile salts
- Incidence about 2.5%-5% of resected GB
- Common benign incidental radiological finding, often during scan for abdo pain
- Probably not the cause of pain in most patients
- May have co-existing stones that could cause pain
- Small association with GB cancer (around 5%) particularly if segmental (hourglass shaped GB), or diffuse
- Isolated small localised fundal thickening (most cases) probably very low cancer risk
- Occasionally resect (cholecystectomy) if localized pain with no other reason

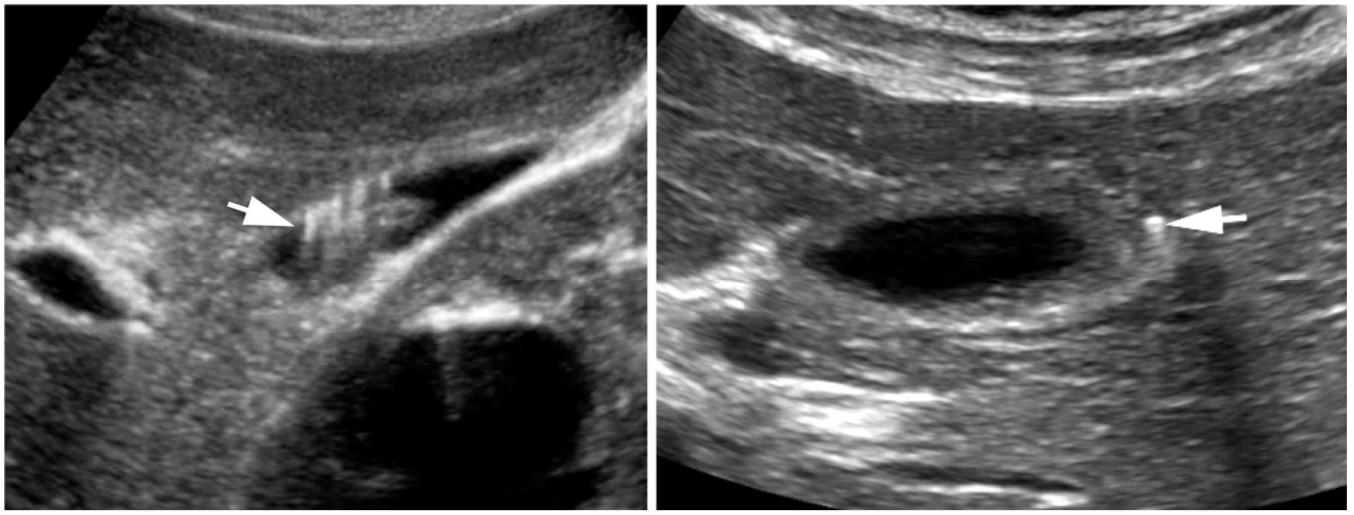
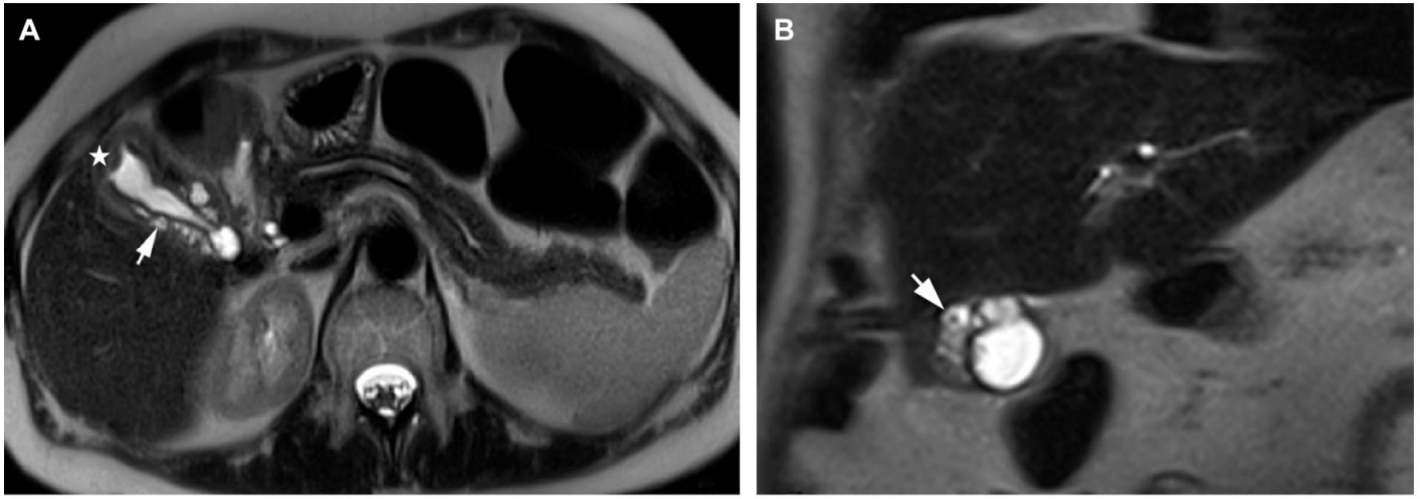


Figure 4. Gallbladder ultrasound showing a segmental (left) or diffuse (right) wall thickening associated with comet tail artifacts (arrows).



Pathognomonic “pearl necklace” appearance on MRI

Golse 2017

Surgical Aspects

Surgical aspects of cholecystectomy

- Laparoscopic standard since 1990s
- Elective surgery
  - Daystay or overnight stay
  - Most return to normal activities within 1-2 weeks
  - I advise normal diet straight away
- Acute surgery
  - Many patients discharged within 48hrs

Surgical aspects of cholecystectomy

- Predictors of a “difficult” cholecystectomy (best done by an HPB surgeon)
  - Repeated attacks of cholecystitis or cholangitis
  - Contracted gallbladder on scan
  - Obesity +/- severe fatty liver
  - Need for intraoperative CBD exploration
  - Mirizzi
  - Cirrhosis
  - Extensive upper abdo surgery

Complications of cholecystectomy

- Early
  - Bile duct injury - around 1 in 1000
    - Most serious complication specific to cholecystectomy
    - Significant morbidity and mortality and longterm consequences
  - Bile leak
    - Many require reoperation (laparoscopic washout) +/- ERCP
  - Surgical site infection, haematoma, medical complications
- Late
  - Bile-salt diarrhoea - around 5-10% - most mild and improve over weeks to months