

Lecture 13: Cholecystitis

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Objectives

- ✓ Recognize the predisposing factors of cholecystitis.
- ✓ Describe the different types of cholecystitis.
- ✓ Understand the pathogenesis of acute and chronic cholecystitis

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Cholelithiasis (Gall stones):

- Majority of gall stones are **asymptomatic**

Types :

1. Cholesterol stones (**most common**): containing **crystalline cholesterol monohydrate**
2. Pigments stones: containing **bilirubin** calcium salts

Risk factors:

1-Cholesterol stones

- Advancing age
- Female gender+ hormones
- Pregnancy
- Obesity
- Oral contraceptives
- Inborn disorders of bile acid metabolism
- Hyperlipidemia syndromes

2-Pigments stones

- Chronic hemolytic syndromes*most common*
- Biliary infections
- Gastrointestinal disorders: ileal disease (e.g.: Crohn's disease), ileal resection or bypass, cystic fibrosis with pancreatic insufficiency

Remember: 5 Fs: 1- Female, 2- Family history
3- Fat (overweight), 4- Forty (age above 40),
5- Fertile (↑ estrogen = ↑ cholesterol)



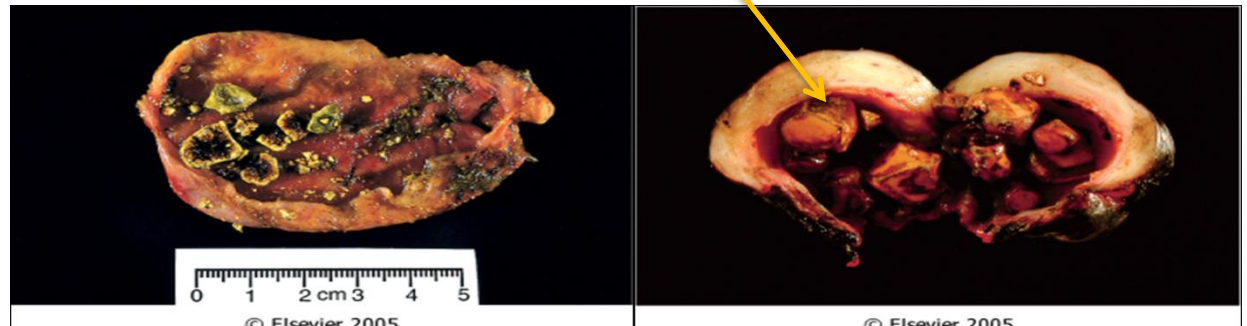
Cholesterol stones

Pathogenesis:

- When cholesterol concentrations exceed the solubilizing capacity of bile (super-saturation) cholesterol can no longer remain dispersed and nucleates (accumulates) into solid cholesterol monohydrate crystals.
- Formation of cholesterol gallstones involves four steps:
 1. **Supersaturation** of bile with cholesterol
 2. **Gall bladder hypomotility**. It promotes nucleation
 3. **Cholesterol nucleation** is started an accelerated
 4. **Mucus hypersecretion** in the gallbladder traps the crystals, permitting their aggregation into stones

Morphology:

- Cholesterol stones arise only in the **gallbladder**
- Yellowish, round or oval or multi-faceted, and have hard external surface
- Most of cholesterol stones are **radiolucent**



Pigments stones

Pathogenesis:

- Based on the presence of **unconjugated bilirubin*** in the biliary tract with precipitation of calcium bilirubin salts (* It means not exclusively to gall bladder, you may see it in the whole biliary tree “e.g: liver ducts”)
- Infection of the biliary tract (e.g: E.coli or Ascaris lumbricodes) increases the percentage of pigment stone formation
- **Chronic hemolytic conditions also increases the percentage of pigment stone formation**

Morphology:

- Black, soft, greasy and multiple
- Pigment stones are **radio-opaque** due to high calcium carbonater and phosphates



Cholesterol stones	Pigments stones
Exclusively in gall bladder	NOT Exclusively in gall bladder
Yellow	Black
Hard external surface	Soft + multiple
radiolucent	Radio-opaque



Cholelithiasis (continued)

Clinical features:

- Most of them are asymptomatic
- The main complication of cholelithiasis is **obstruction of bile duct** (which leads to **cholecystitis**)
- The 2nd main complication is **pancreatitis** (Gravel “small stones” are more prone to cause obstruction than big stones)
- Other complications such as empyema (accumulation of pus in gall bladder), perforation, fistulae and cholangitis (inflammation of the biliary tree)

Cholesterosis*

Definition:

- **Cholesterol hypersecretion** by the liver promotes excessive accumulation of **cholesterol esters** within the lamina propria of the gallbladder
- The mucosal surface is studded with minute yellow flecks, producing the “strawberry gallbladder” projection like



strawberries



Strawberry
gallbladder and
stones

* It's morphological finding
not clinical finding



Cholecystitis

Definition: Inflammation of the gallbladder and its association almost with **gallstones**. Could be:

1. Acute
2. Chronic
3. Acute superimposed on chronic

Acute cholecystitis:

Types:

- I. Acute calculous cholecystitis (within gallstones) **-common-**
 - precipitated 90% of the time by **obstruction of the neck or cystic duct**.
 - It is the primary **complication of gallstones**
 - the most common reason for emergency **cholecystectomy**
 - Pathogenesis: results from chemical irritation and **inflammation of the obstructed gallbladder in absence of bacterial infection**
- II. Acute acalculous cholecystitis (without gallstones) **-uncommon-**
 - Most cases occur in the following conditions* :
 1. the postoperative state after major surgery
 2. severe trauma (e.g. motor vehicle accidents)
 3. Severe burns
 4. Multi system organ failure
 5. sepsis

***NOTE:** occurs in systemic conditions which is not related to biliary systems



Acute cholecystitis (continued):

Morphology:

- **Empyema** of the gallbladder
- **Thickened, edematous and hyperemic (congested)** gallbladder

Clinical features:

- **right upper quadrant or epigastric pain** (Colicky pain)
- associated with mild fever, anorexia, tachycardia, sweating, and nausea and vomiting
- Acute calculous cholecystitis may appear with remarkable suddenness and constitute an acute surgical emergency or may present with mild symptoms that resolve without medical intervention
- acute acalculous cholecystitis have no symptoms referable to the gallbladder (as we said it occurs with other systemic conditions, so gallbladder symptoms masked or disappears with the other systemic symptoms)



Chronic cholecystitis

- Chronic cholecystitis may be a sequel to repeated bouts of acute cholecystitis
- But in most instances it develops without any history of acute cholecystitis
- It is associated with cholelithiasis in over 90% of cases

Clinical features:

- The symptoms of chronic cholecystitis are similar to those of the acute form (right upper quadrant or epigastric pain “colicky pain”)
- Patients often have intolerance to fatty food

Morphology:

- **Fibrotic** (edematous in acute cholecystitis) and **atrophied** gallbladder (thickened in acute cholecystitis)
- Rokitansky-Aschoff sinuses: long standing inflammation leading to Outpouchings* of the mucosal epithelium through the wall (hernia)
- **porcelain gallbladder**: rare condition, it's an extensive **dystrophic calcification within the gallbladder wall. It increased incidence of associated cancer**
- **Xanthogranulomatous cholecystitis**: rare condition in which the gallbladder is shrunken, nodular, fibrosed and chronically inflamed with abundant lipid filled macrophages
- **hydrops of the gallbladder**: an atrophic, chronically obstructed gallbladder may contain only clear secretions

* Mean = Outer sac



Acute and chronic cholecystitis:

Complications of both:

- ✓ Bacterial superinfection with cholangitis or sepsis
- ✓ Gallbladder perforation & local abscess formation
- ✓ Gallbladder rupture with diffuse peritonitis
- ✓ Biliary enteric (cholecystenteric) fistula with drainage of bile into adjacent organs, and potentially gallstone-induced intestinal obstruction (ileus)
- ✓ Aggravation of pre-existing medical illness, with cardiac, pulmonary, renal, or liver decompensation



Summary from Robbins



SUMMARY

Diseases of the Gallbladder and Extrahepatic Bile Ducts

- Gallbladder diseases include cholelithiasis and acute and chronic cholecystitis.
- Gallstone formation is a common condition in Western countries. The great majority of the gallstones are cholesterol stones. Pigmented stones containing bilirubin and calcium are most common in Asian countries.
- Risk factors for the development of cholesterol stones are advancing age, female gender, estrogen use, obesity, and heredity.
- Cholecystitis almost always occurs in association with cholelithiasis, although in about 10% of cases it occurs in the absence of gallstones.
- Acute calculous cholecystitis is the most common reason for emergency cholecystectomy.
- Obstructive lesions of the extrahepatic bile ducts in adults can give rise to ascending infection (cholangitis) and secondary biliary cirrhosis.
- Infants born with congenital biliary atresia present with neonatal cholestasis and require liver transplantation for cure.

