College of medicine
Department of pathology
3rd year

Hepatobiliary system

LEC. 4

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Symptoms of gallstones.

70% to 80% 0f patients with gallstones remain asymptomatic throughout life,

The remainder becoming symptomatic at the rate of 1% to 3% per year.

The symptoms are biliary colic at right hypochondrium, vomiting.

Biliary pain of constant or colicky, spasmodic in nature due to obstruction.

Complications of gallstones

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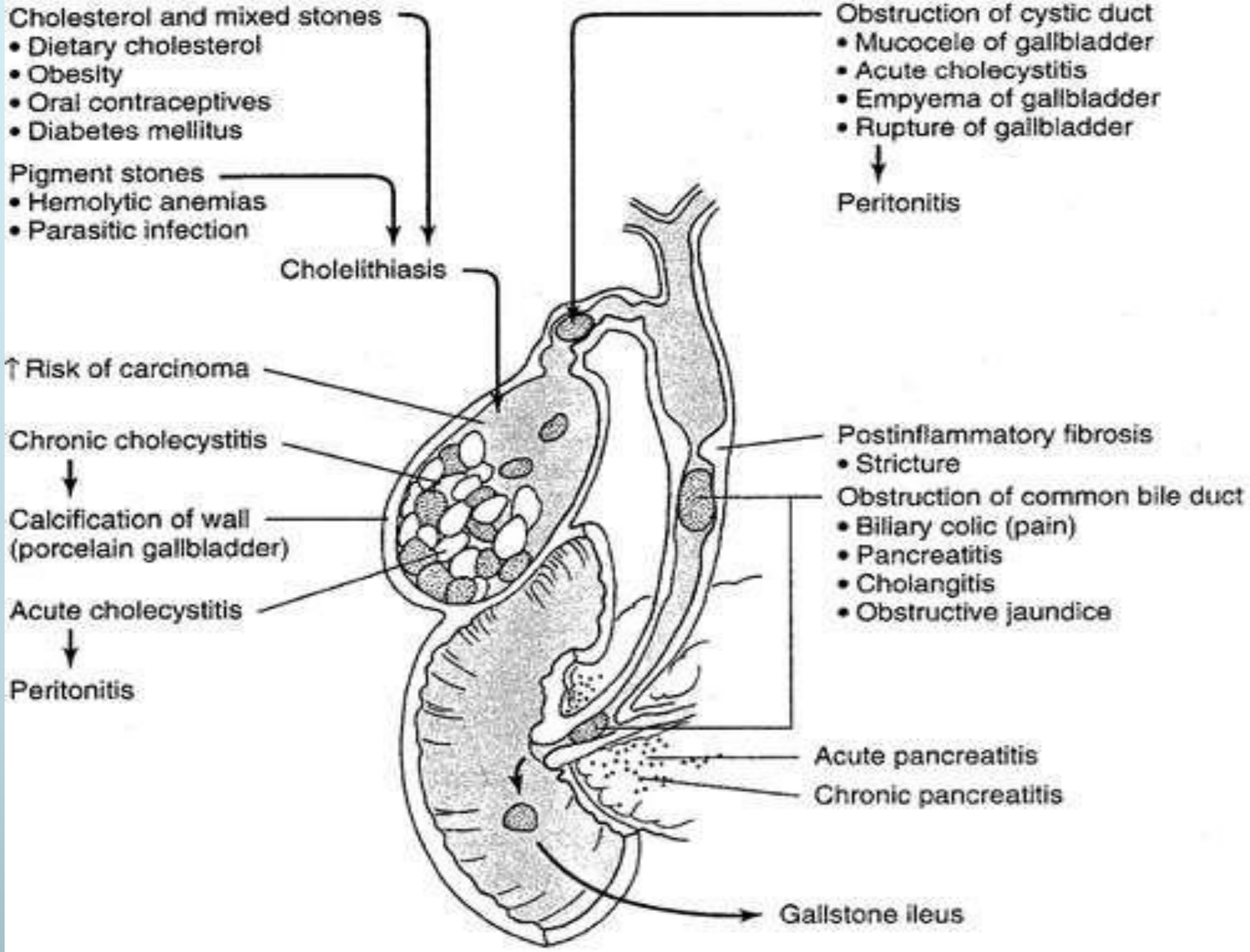
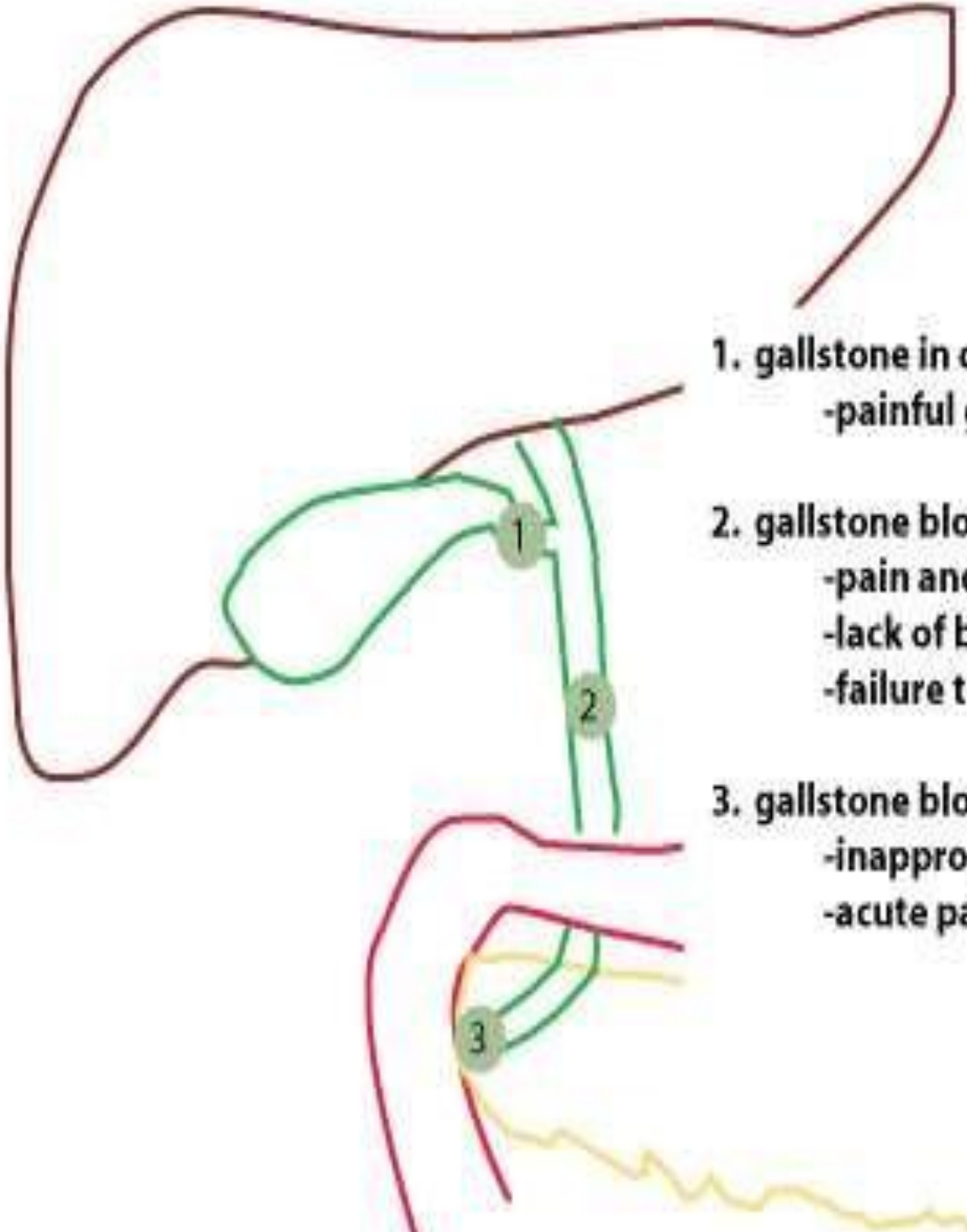
1. 1-2% have acute or chronic cholecystitis
2. Choledocholithiasis (stones in the common bile duct).
3. Cholangitis (inflammation of biliary tree).
4. Empyema (impaction of stone at the neck of gallbladder).
5. Gallstone ileus (a large stone may erode directly into the adjacent loop of small bowel, generating intestinal obstruction).
6. Acute pancreatitis.
7. Biliary fistulae.


Cholesterol and mixed stones
• Dietary cholesterol
• Obesity
• Oral contraceptives
• Diabetes mellitus
Pigment stones
• Hemolytic anemias
• Parasitic infection
Cholelithiasis
↑ Risk of carcinoma
Chronic cholecystitis
Calcification of wall (porcelain gallbladder)
Acute cholecystitis
Peritonitis
Obstruction of cystic duct
• Mucocele of gallbladder
• Acute cholecystitis
• Empyema of gallbladder
• Rupture of gallbladder
Peritonitis
Postinflammatory fibrosis
• Stricture
Obstruction of common bile duct
• Biliary colic (pain)
• Pancreatitis
• Cholangitis
• Obstructive jaundice
Acute pancreatitis
Chronic pancreatitis
Gallstone ileus

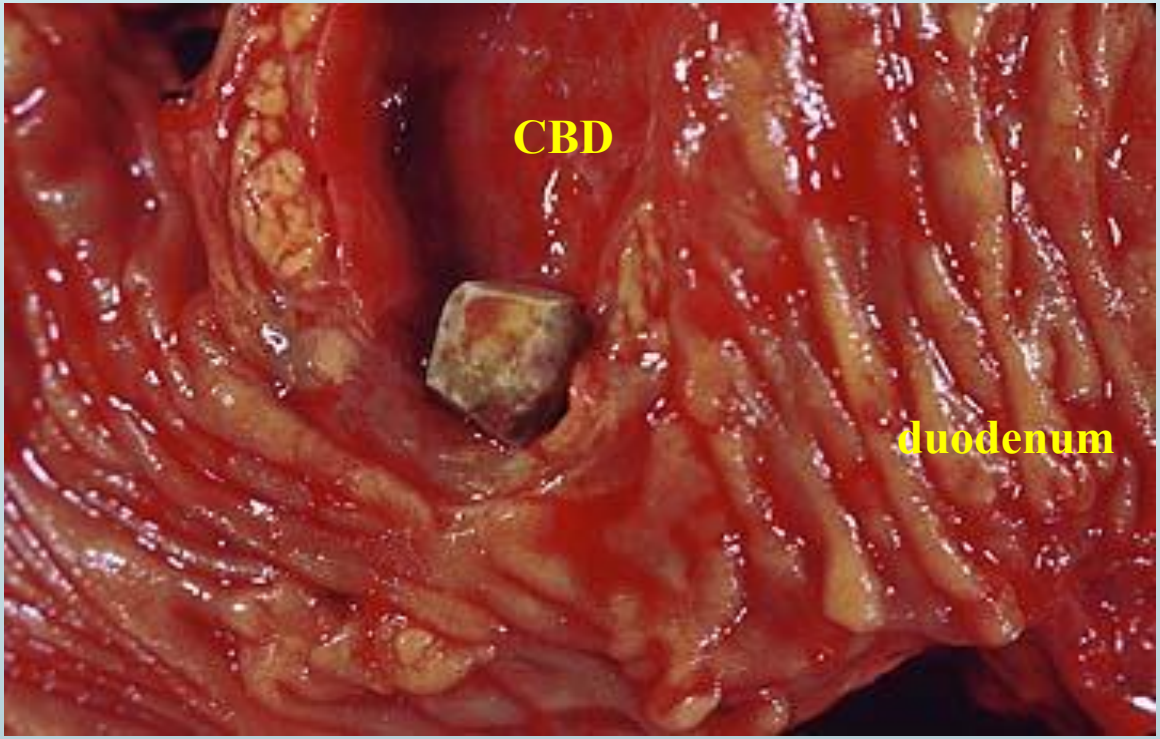


1. gallstone in cystic bile duct:
   - -painful gallbladder contractions

2. gallstone blocking common bile duct:
   - -pain and nausea
   - -lack of bile release
   - -failure to excrete bilirubin leads to jaundice

3. gallstone blocking duodenal papilla:
   - -inappropriate activation of pancreatic zymogen
   - -acute pancreatitis

Impacted stone at ampulla within marked dilated common bile duct (CBD).



Papillary adenocarcinoma of the gallbladder in a patient with gallstones.

Cholecystitis

- Def: Inflammation of the gallbladder
- Can be divided into
  - Acute cholecystitis
  - Chronic cholecystitis
  - Acute superimposed on chronic

Acute: fever, leukocytosis, RUQ pain

Chronic: Subclinical or pain

Ultrasound can detect stones well

Go hand in hand with stones in gallbladder or ducts

Cholecystitis predisposes to cholelithiasis, and VICE VERSA!

If surgery is required, most is laparoscopic

Cholecystitis:

Acute, Chronic, & acute superimposed on Chronic.

Acute cholecystitis:

1-Acute calculous cholecystitis:

90% of cases

caused by gallstone obstruction of the neck or the cystic duct

2- Acute acalculus cholecystitis Which occurs in the absence of gallstones

Pathogenesis of acute calculus cholecystitis:

three important mechanisms are involved in development of acute calculus cholecystitis.

1-Chronic obstruction of bile flow by stones…distention & increased in the intraluminal pressure that compromise the blood flow.

2-Chemical irritation & inflammation of gallbladder wall

as the normal protective glycoprotein mucosal layer is disrupted exposing the mucosal epithelium to direct detergent action of the bile salts.

3-Release of hydrolytic enzymes from the mucosa (phospholipase) which hydrolyzed the biliary lecithin into lysolecithine, which is toxic to the mucosa.

Acute cholecystitis:

Gross:

enlarged, distended gallbladder; congested vessels .

Serosal and mucosal exudates,

thickened wall with edema and hemorrhage; ulcers with blood clot, pus and bile.

In 90% of cases, stones are present; obstruct the neck of gallbladder or the cystic duct.

When the lumen of gallbladder is filled with frank pus. This condition is called empyema of gallbladder.

In more severe cases the gallbladder is transformed into a green- black necrotic organ, termed gangeranous cholecyetitis.

Microscopically:

- Initially :edema,
- Vascular congestion, hemorrhage,
- later mucosal and mural necrosis with **neutrophils**; variable reactive epithelial changes resembling Dysplasia.

Clinical features:

- Either as an acute emergency with Rt. Upper quadrent or epigastric pain, mild fever, anorexia, nausea & vomiting.
- OR as mild symptoms that resolve without treatments.
- Free of jaundice except in obstruction of the common bile duct.
- The attack usually subsides within 7-10 days, but Recurrence is common.

Complications of acute cholecystitis

1-**mucocele** of the gallbladder

2-Empyema: local abscess formation of the gallbladder.

3-Secondary bacterial infection of the biliary tree (**Ascending bacterial cholangitis**).

4-Gallbladder **perforation or ruptures: escape of the contents into the peritoneal cavity leads to localized or generalized peritonitis.**

5-Biliary – enteric fistula. due to ulceration of the gallbladder by a large cholesterol stone through the duodenum or the colon.

6- Pancreatitis.

7- Obstructive choleycystitis, small gall stones more dangerous because enter the cystic duct or common bile duct lead to obstruction & **secondary biliary cirrhosis**.

8- increase the risk of carcinoma of the gallbladder.

Acute **Acalculus** cholecystitis. **no gallstones**.

Represent 10% of cases.

Causes.

(1) The postoperative state after major nonbiliary surgery.

(2) Severe trauma (e.g. car accident……etc).

(3) Severe burns.

(4) Sepsis.

There are multiple events are thought to contribute to acalculus cholecystitis. Like dehydration, gallbladder stasis, shock & bacterial contamination.

Chronic cholecystitis:

Results from repeated attacks of acute cholecystitis, usually insidious, accompanied by dyspeptic symptoms or biliary colic.

Gallstones are almost always present.

95% of cases are associated with gallstones.

- Bacteria present in 11-30%, similar organisms as in acute cholecystitis (Escherichia coli & enterococci).
- 75% of cases are in female within the fourth decade of life

Morphology :

Gross:

Variable(may be normal size, contracted or enlarged)

thickening of gallbladder wall, variable adhesions.

Ulceration of mucosa is may be due to pressure by stones.

Mic.

Mucosa shows variable degrees of mononuclear inflammatory cells infiltration & fibrosis.

Surface epithelium may be relatively normal, atrophic, or shows hyperplastic or metaplastic changes.

The gallbladder wall may show fibrosis, smooth muscle hypertrophy.

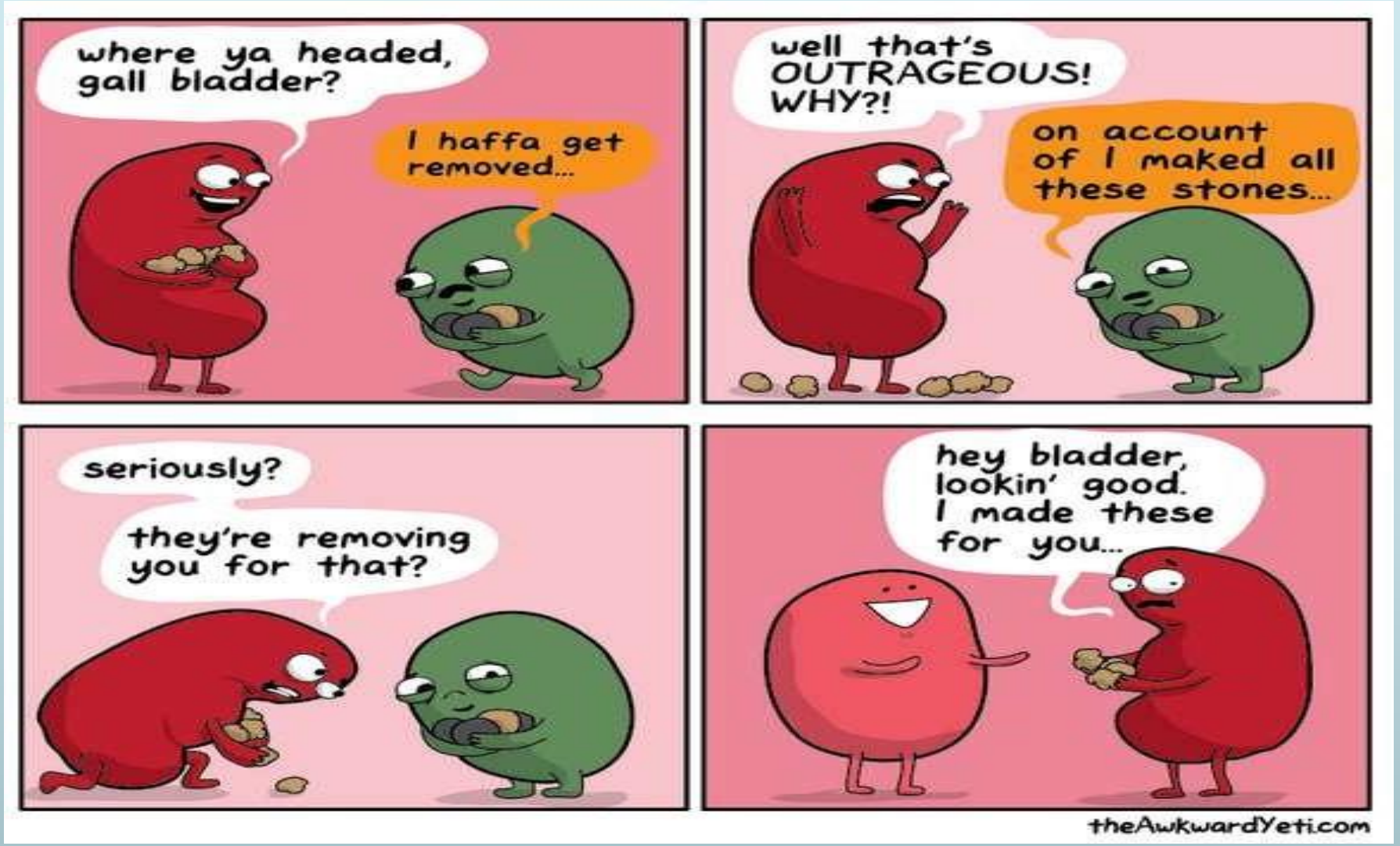
Chronic cholecystitis:

Complications of chronic cholecystitis

:

1. Acute cholecystitis.
2. Choledocholithiasis.
3. Acute pancreatitis.
4. Gallstone ileus.
5. Biliary fistulas.

- Treatment : Cholecystectomy



Tumors of the gall bladder

Benign tumors: very rare as fibroma, lipoma & papilloma.

Malignant: Uncommon, Mainly **adenocarcinoma**

- female : male 3-4:1.
- seventh decade of life.
- Gallstones are present in 60% to 90% of cases.

Gall stone is an important factor in its causation

Usually slowly growing & infiltrating type,

- Direct invasion to the liver or metastasized to the lymph nodes Bile duct carcinoma usually presented with **obstructive jaundice**.

Morphology of gall bladder ca

- **Gross: either**
- (1) Infiltrative (diffuse).
- (2) Exophytic (irregular, cauliflower mass).
- Sometimes contain gallstones
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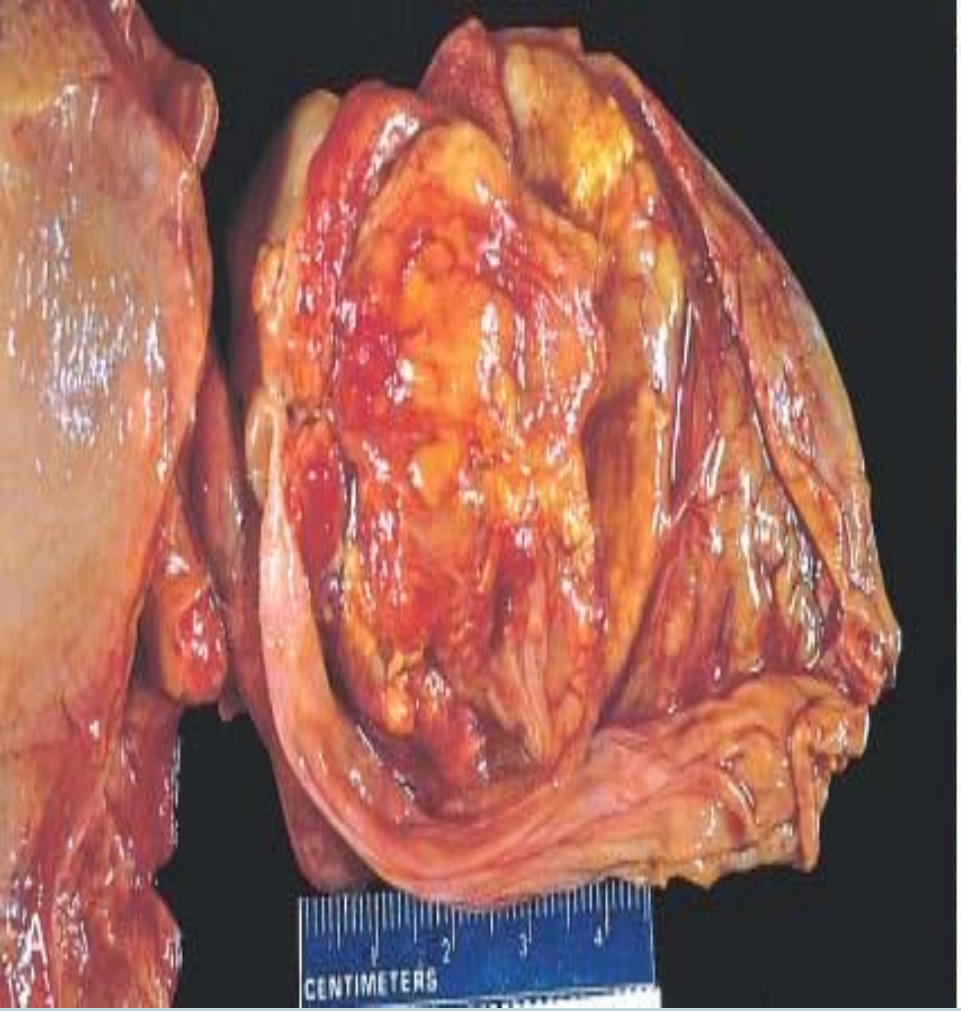
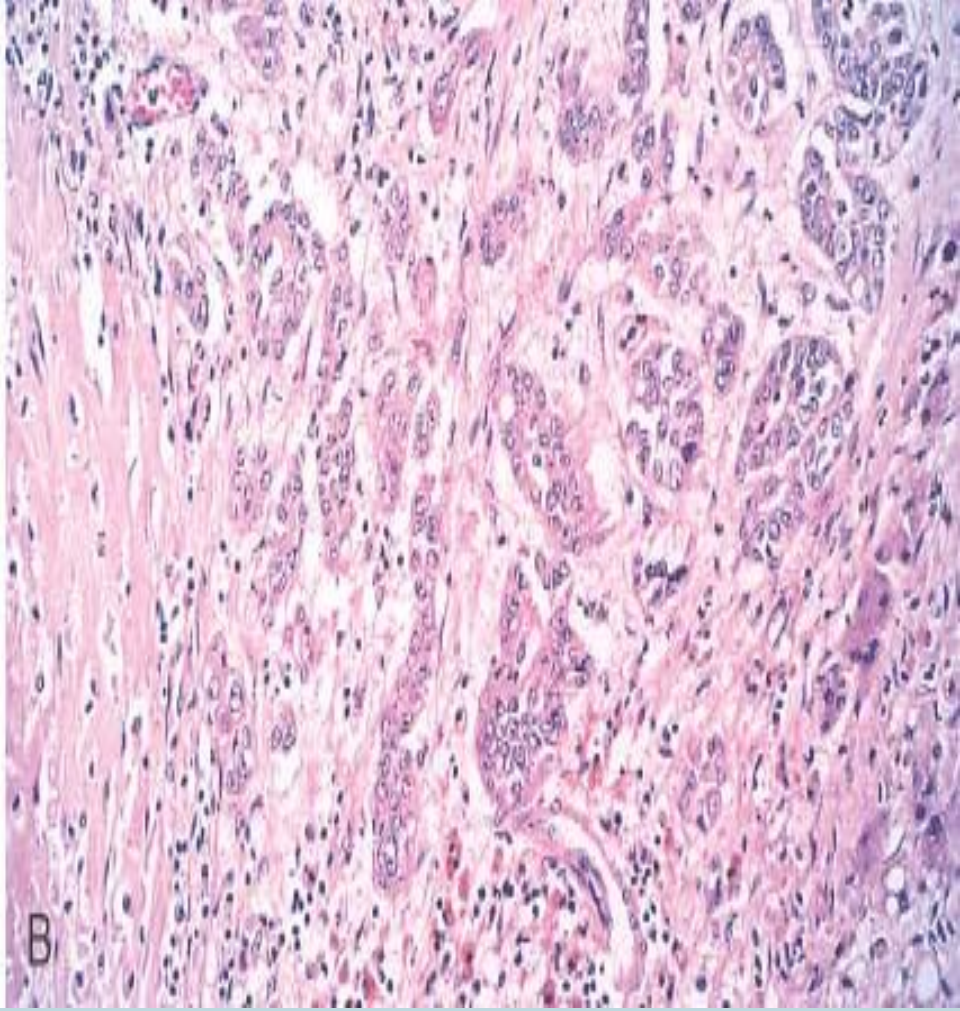
- **Micro:** most cases are adencarcinoma. Some are papillary & other are poorly differentiated carcinoma.





Adenocarcinoma of the gallbladder

Biliary tree pathology

INTRAHEPATIC BILE DUCTS

Choledochlithiasis:

It is means the presence of stones within biliary tree (common bile duct).

Either primary stones or secondary stones (commonest).

Primary stones are formed within common bile duct (CBD). & while secondary stones are formed within gallbladder & then enter the CBD.

Complications of Choledocholithiasis

1- 10% are asymptomatic.

2. Biliary obstruction.

3. Pancreatitis.

4. Cholangitis

5. Hepatic abscess.

6. Chronic liver diseases. …**secondary biliary cirrhosis**.

Cholangitis

It is referred to acute inflammation of the wall of bile ducts, which always caused by bacterial infection of the normally sterile lumen.

Causes:

1. Gallstones.
2. Complications of biliary surgery.
3. Tumors.
4. catherterization of biliary.
5. Acute pancreatitis
6. Benign strictures.
7. Parasitic infections.

Pathogenesis of cholangitis

: two mechanisms are involved.

A.

Obstruction of biliary tree. (stones, tumors, ….etc)

B.

Bacterial infection. (Most likely enter biliary tree through the sphincter of oddi rather than hematogenous route. The bacteria are usually G-ve aerobes such as E.coli, Klebsiella, clostridium, bacteroides).

These two mechanisms are must be occur together.

Symptoms of cholangitis: include fever, abdominal pain, and jaundice

Carcinoma of biliary tree.(cholangiocarcinoma).

It is referred to carcinoma of intrahepatic &extrahepatic ducts.

Those of **intrahepatic bile ducts** are closely resemble to HCC.

While those of **extrahepatics d**ucts are usually cause **painless, progressive deepening jaundice.**

more in elderly male.

Risk factors of chlangiocarcinoma:

1-Primary sclerosing cholangitis.

2-Inflammatory bowel diseases.

3-Gallstones.

Morphology of cholangiocarcinoma

Gross. Is either:

1. **Grey, firm nodules.**
2. **Diffuse infiltrative lesions.**

Mic.

- **cholangiocarcinoma is arising from bile duct epithelium.**

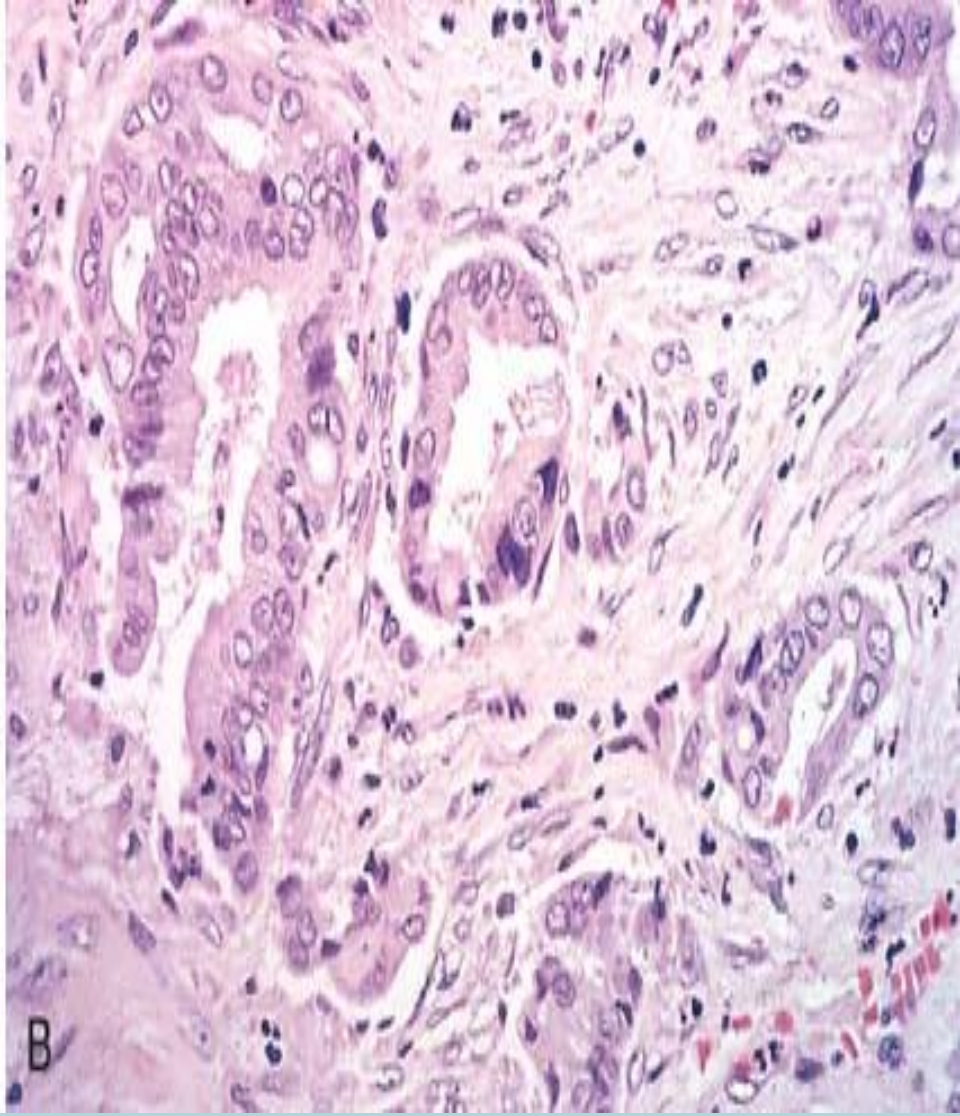
It resemble **adenocarcinoma**, mostly moderately differentiated sclerosing carcinoma.

- glandular, or trabecular structures that are lined by anaplastic cuboidal low columnar epithelial cells ; with dense collagenous stroma separate the glandular elements. **(desmoplastic carcinoma).**

Cholangiocarcinoma

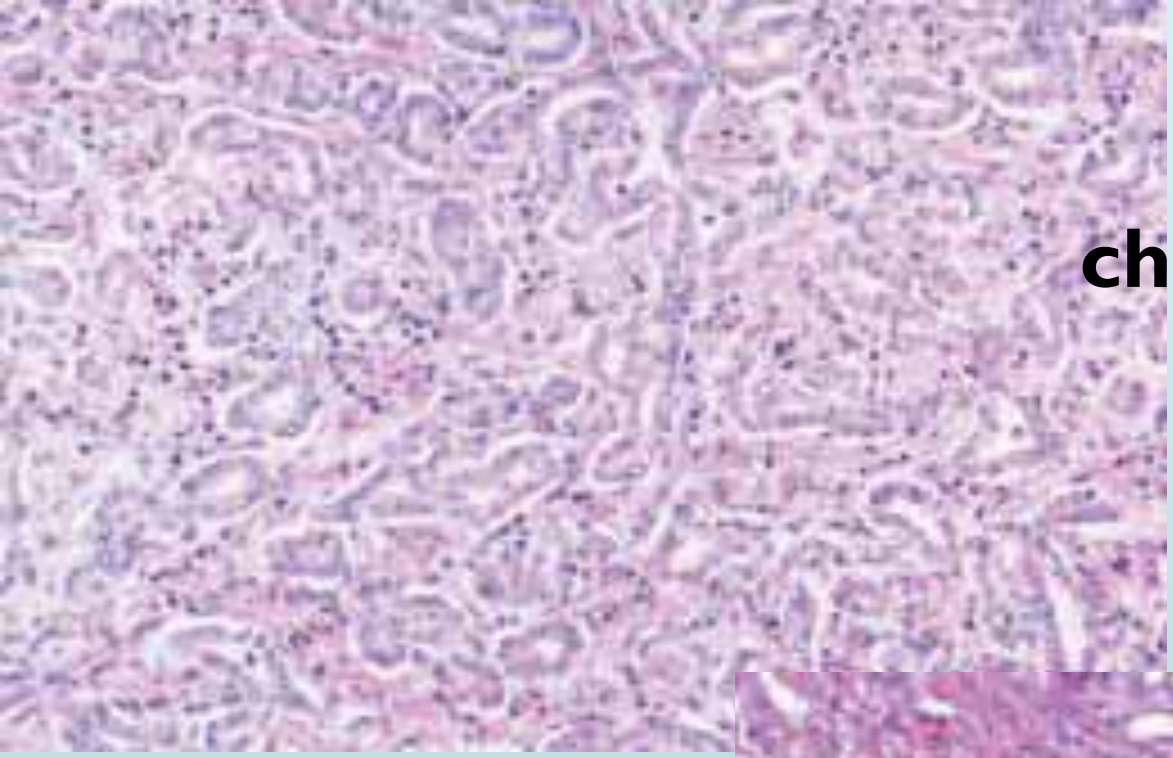
Hematogenous metastasis to the lung, bones (mainly vertebrae), adrenals & brain in 50% of the cases., but less frequent with hepatocellular carcinoma.

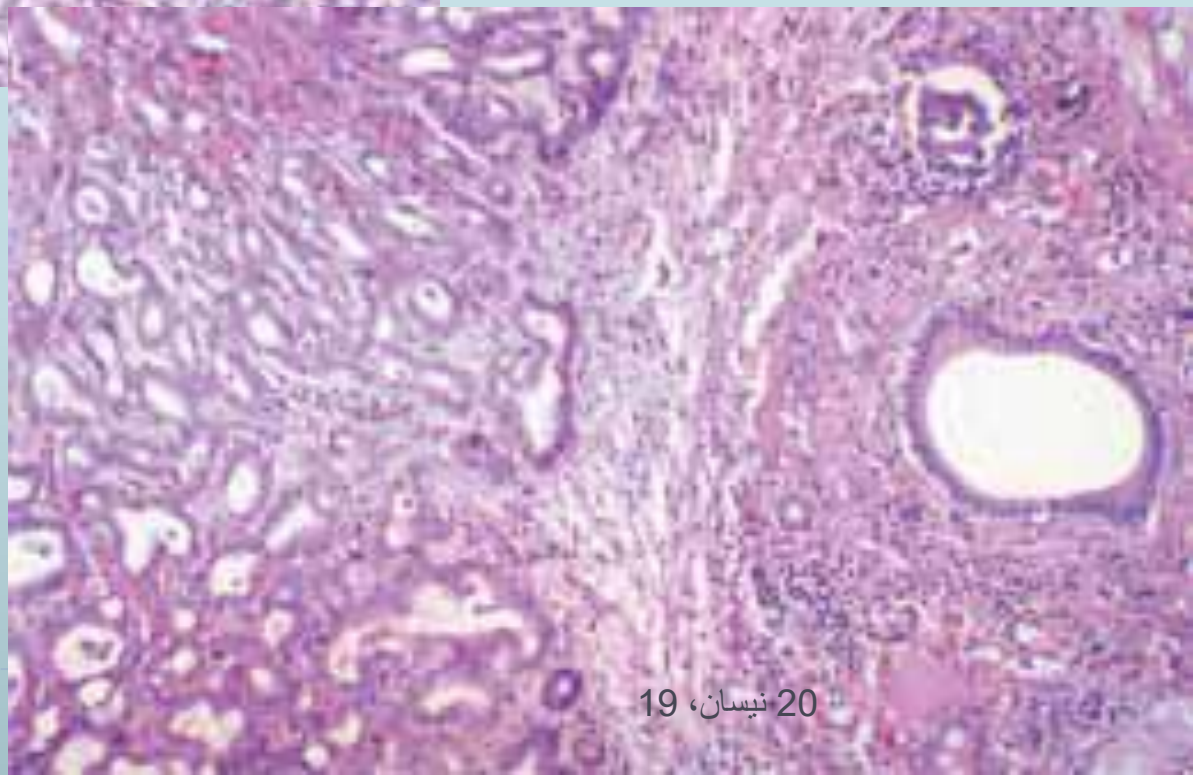
Also 50% of cholangiocarcinoma spread by lymph node metastasis, mainly peri-hilar, peri-pancreatic & Para-aortic lymph nodes above & below the diaphragm, also less frequently with hepatocellular carcinoma.



CHOLANGIOCARCINOMA

cholangiocarcinoma





Clinical features:

- Undefined upper abdominal pain, malaise, fatigue, weight loss, abdominal fullness.
- Sometimes hepatomegaly with irregularity or nodularity or as abdominal mass.
- High level of serum alpha-feto protein marker in 60 -75 % of hepatocellular carcinoma.

Prognosis:

Usually there is a progressive enlargement of the primary mass until the first metastasis to the lung occurs, then to the other sites.

Death usually occurs within 10 months after the diagnosis from the following complications:

A. Cachexia.
B. GIT or esophageal variceal bleeding.
C. liver failure & hepatic coma.
D. Rupture of the tumor with fatal hemorrhage (rare).