DISORDERS OF THE GALLBLADDER

- **Disorders of the gallbladder**
  - **Cholelithiasis** (formation of gall stones)
  - **Cholecystitis** (inflammation " " bladder)
  - **Tumors**

CHOLELITHIASIS

- Common disease affecting 10-20% of adults
- >80% are asymptomatic
- Two main types of gall stones:
  - 1) Cholesterol stones (80% in west)
  - 2) Bilirubin calcium salts (pigment) stones

- Pathogenesis:
  - 1) bile supersaturation with cholesterol
  - 2) nucleation: promoted by gallbladder hypomotility (stasis) stasis of bile in gallbladder, promoted by 11 11
  - 3) Cholesterol crystals remaining long enough to aggregate

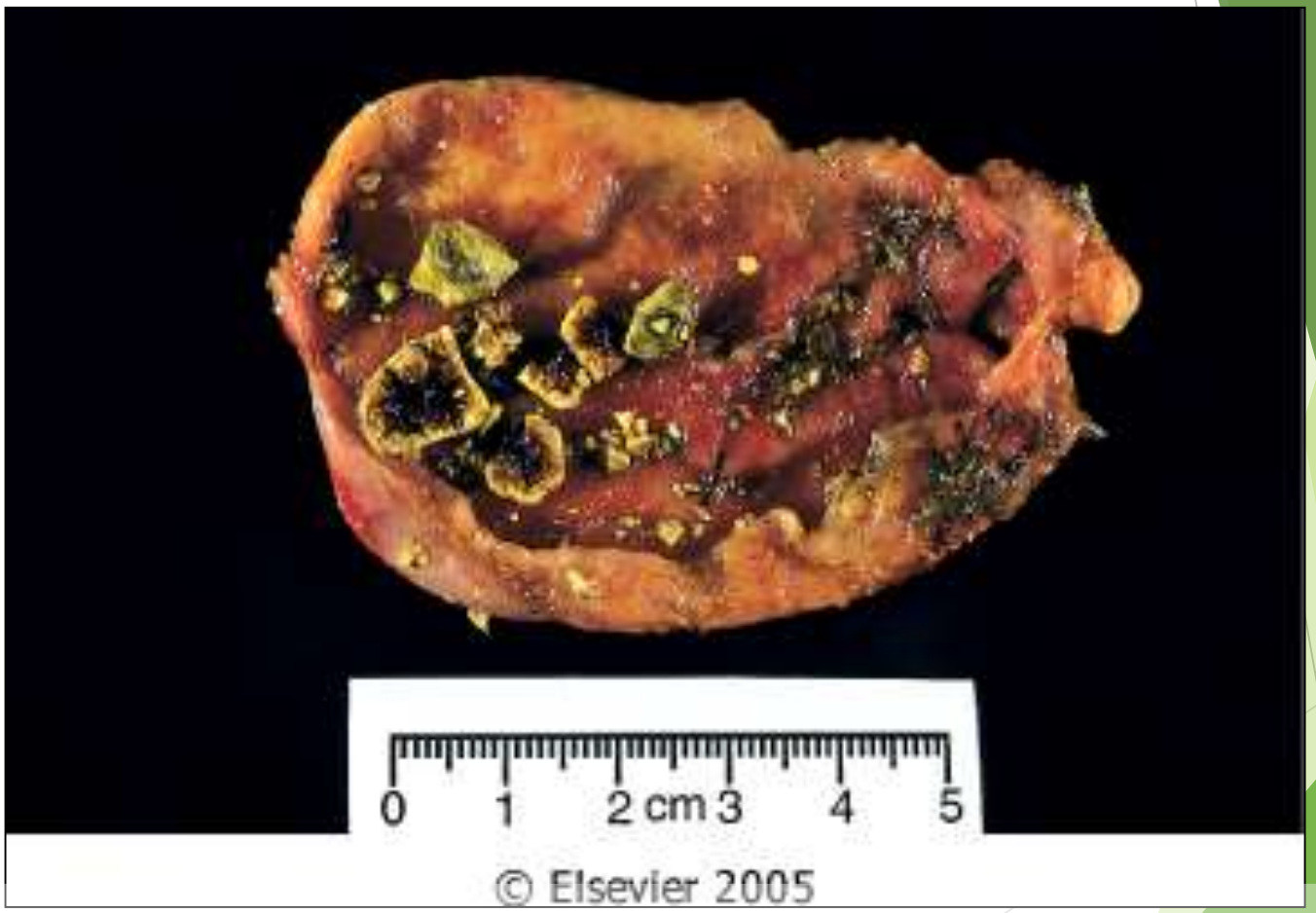
Appearance

- **Cholesterol stones:** exclusively in GB, single or multiple, multi-faceted, most are radiolucent
  - Pure: pale yellow
  - Mixed: gray white to black, containing calcium carbonate, phosphates & bilirubin

- **Pigment stones**: anywhere in biliary tree, contain calcium salts of unconjugated bilirubin (calcium bilirubinate), mucin glycoproteins & cholesterol
  - Black: in sterile GB bile, small, numerous, friable, 50-75% are radioopaque
  - Brown in infected bile ducts, single or few, soft & greasy, radiolucent

Cholesterol gallstones

characterized by yellow color especially the pure cholesterol stones, sometimes they are mixed with other solutes giving them other discolorations



Pigmented gallstones

black, numerous, friable, radiopaque, mostly formed of calcium bilirubinate

RISK FACTORS OF CHOLELITHIASIS

- Affects 80% of people
- No identifiable risk factors other than age and gender

- **Risk factors for cholesterol stones**
  - Age: elderly> young adults >40 y.o
  - Gender: females (2:1)
  - Oral contraceptives (OCPs), pregnancy
  - Demography: Western World;
  - Gallbladder stasis
  - Family history.
  - Inborn disorders of bile acid metabolism
  - Obesity
  - Hyperlipidemia
  - Rapid weight loss
  - Treatment with the hypocholesterolemic (lipids lowering drugs)

- **Risk factors for pigment stones**
  - Demography: Asians, rural areas
  - Chronic hemolytic syndromes sickle cell anemia, thelasemia
  - Biliary infection
  - Gastrointestinal disorders: (malabsorption)
    - Ileal disease, e.g. Crohn's disease
    - Ileal resection or bypass
    - Cystic fibrosis with pancreatic insufficiency+malabsorption

CLINICAL FEATURES OF CHOLELITHIASIS

- **Clinical presentation:**
  - 70-80% are asymptomatic
  - Biliary pain, constant or colicky from an obstructed gallbladder or biliary tree (typical acute presentation)
  - Associated with inflammation of gallbladder
- **Complications:**
  - Empyema
    puss in gallbladder
  - Perforation
  - Fistulae induced by stones, between GB or biliary tract with other organs
  - Inflammation of biliary tree (cholingitis)
  - Obstructive cholestasis (jaundice)
  - Pancreatitis ?obstruction of pancreatic ducts
  - Intestinal (bowel) obstruction ("gallstone ileus")
    gallstones can escape GB cystic duct → bile ducts → small bowel → intestinal obstruction

CHOLECYSTITIS

- Inflammation of the gallbladder
- **Almost always associated with gallstones**
- One of the most common indications for abdominal surgery
- Epidemiologic distribution similar to cholelithiasis examine specimens
- Classification: acute / chronic
  - Acute calculous (related to gall stones)
  - Acute acalculous
  - Chronic
  - Acute on top of chronic

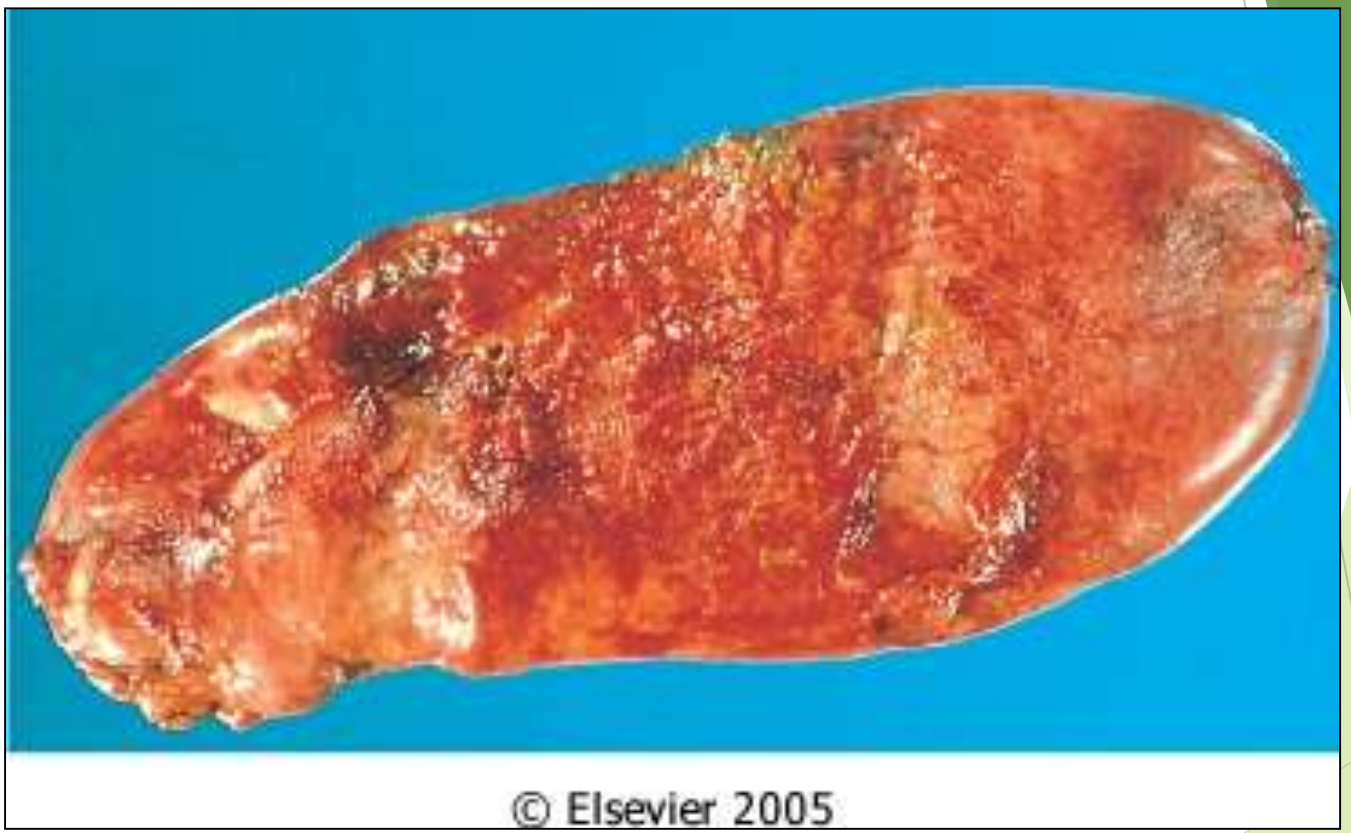
TYPES OF ACUTE CHOLECYSTITIS

- **Acute calculous cholecystitis:** caused by obstruction of GB neck or cystic duct by stones
  - Chemical irritation & inflammation of GB wall
  - Blood flow compromise due to GB distension & pressure on blood supply
  - Symptoms may be mild or sudden & severe
- Most common reason for emergency cholecystectomy.
- Mostly in absence of bacterial infection. (bile/specimen will be sterile)

- **Acute acalculous cholecystitis:** 5-12% of cases
  - Seen in 1) post-operative states, 2) severe trauma, 3) severe burns, 4) sepsis & 5) postpartum
  - Factors: 1) dehydration, 2) GB stasis & sludging, 3) vascular compromise, 5) bacterial contamination 6) super infx

when you examine GB, you do NOT find gall stones or even upon imaging studies and exam

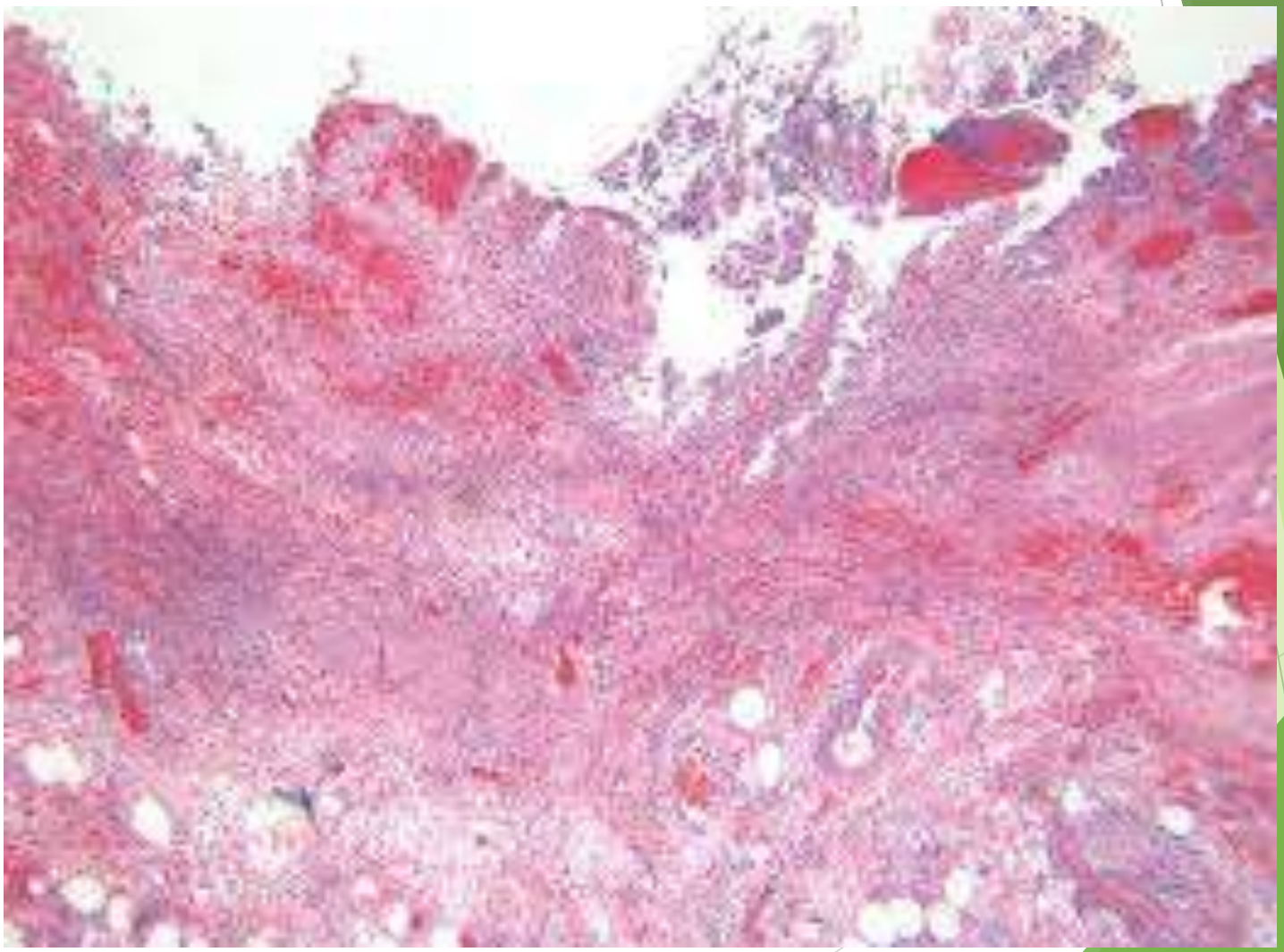
GB from outside, serosa is congested, hemorrhagic & inflammed
(acute cholecystitis)



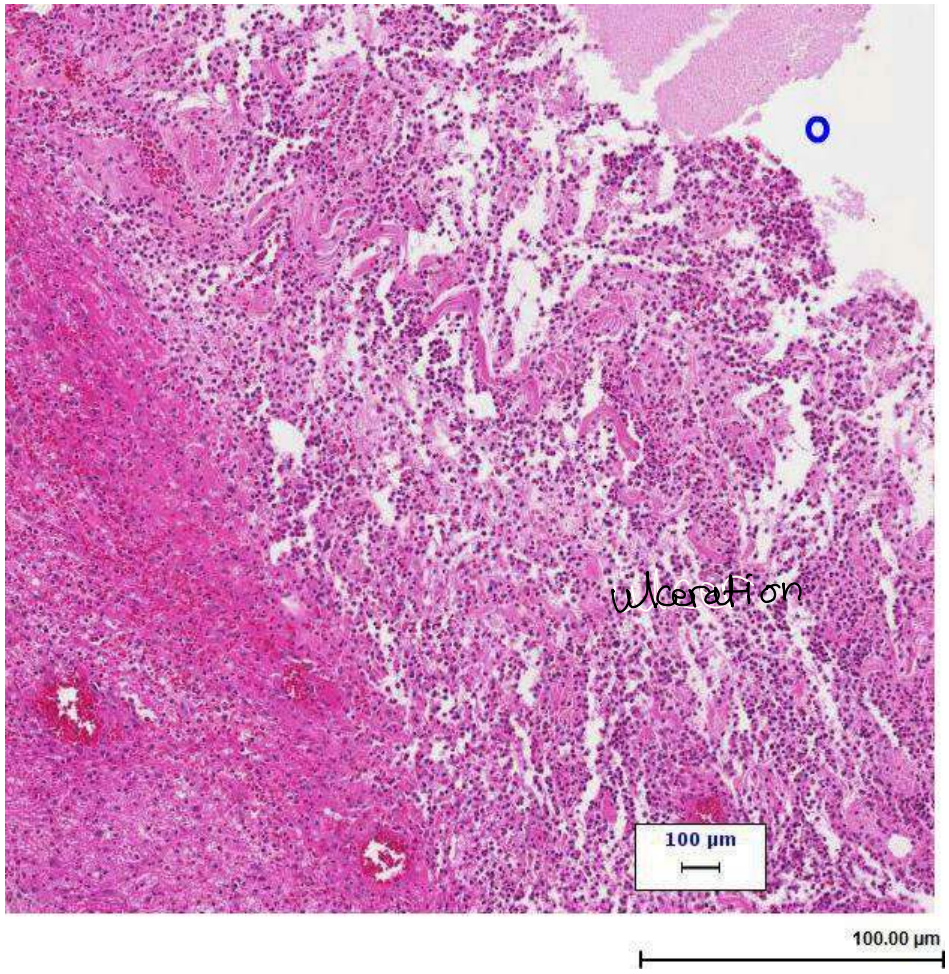
PATHOLOGY OF ACUTE CHOLECYSTITIS

- Enlarged (2-3x), tense GB with discolorations due to subserosal hemorrhages.
- Serosal fibrinous or suppurative exudate formed of pus
- Stones obstructing GB neck or cystic duct in 90%
- GB lumen filled with turbid bile, +/- fibrin, hemorrhage & pus
- Empyema of gallbladder: full of pus
- Thickened edematous hyperemic wall (cardinal features of inflammation)
- Gangrenous cholecystitis: black necrotic GB
- Hallmarks: Histology: edema, WBC infiltration, congestion, abscess, hemorrhage & necrosis

mucosa is sluffed (removed or ulcerated), hemorrhage, necrosis of the lining



Cacute inflammatory cell(s) infiltration ? blood & hemorrhage



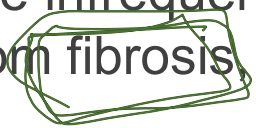
CHRONIC CHOLECYSTITIS

- +/- history of acute cholecystitis (NOT always)
- Gallstones almost always present,
- Supersaturation of bile predisposes to chronic inflammation & stone formation, NOT the obstruction. it is related to the irritation & inflammation
- Variable morphologic appearance: minimal changes, contraction, small enlargment, mucosal ulceration or wall thickeninig (X specific)

start as flesh circles

// // atrophy

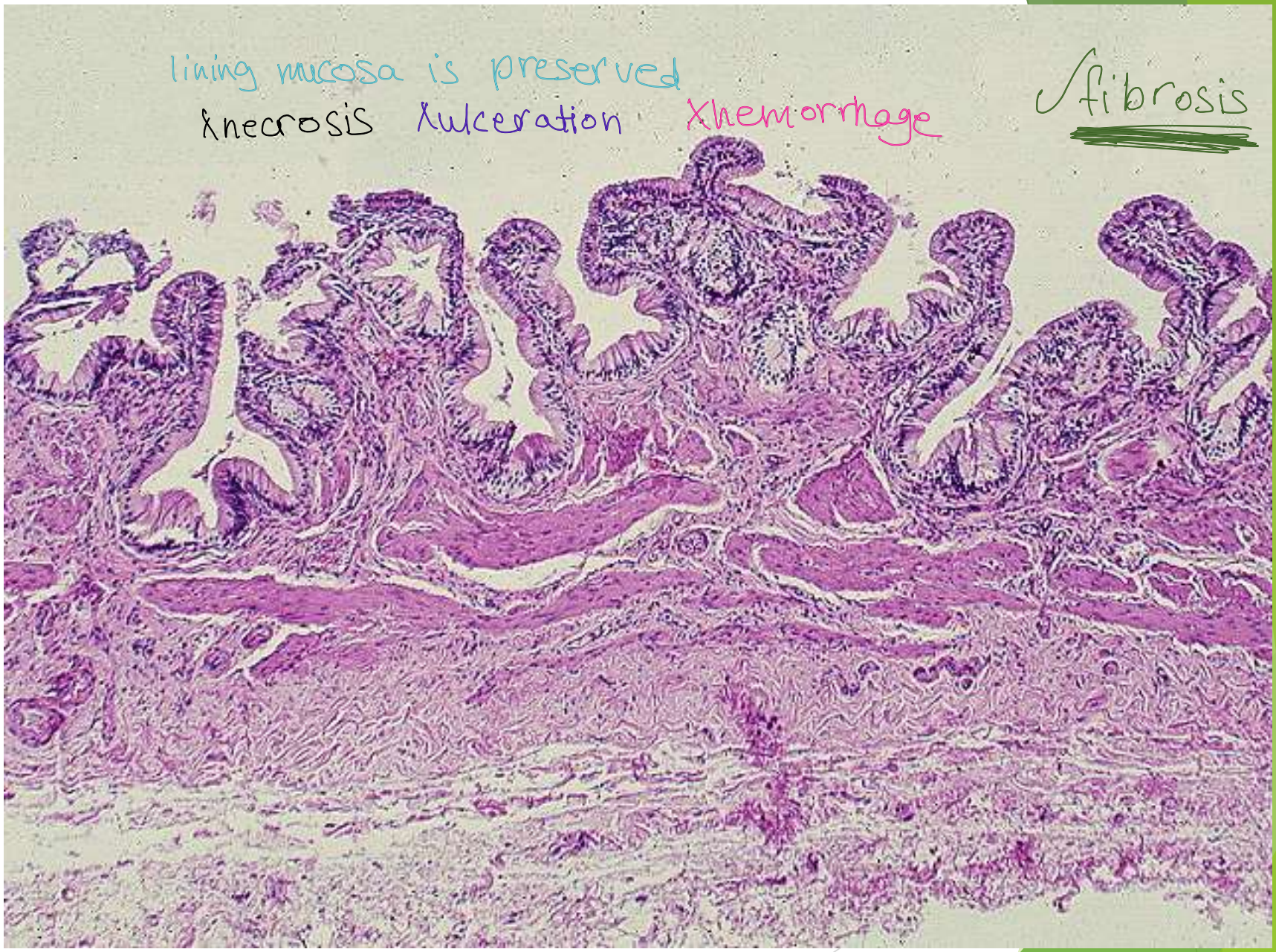
- **Histology:** Mucosal ulcerations are infrequent; the submucosa and subserosa often are thickened from fibrosis, lymphocytes may be only clue of inflammation.



GB wall, thickened by fibrosis in chronic cholecystitis
// (↓ edema in acute)

pink → fibrosis & collagen deposition
which is the hallmark of chronic cholecystitis


flattened mucosa


lining mucosa is preserved
✗necrosis
✗ulceration
✗hemorrhage
✓fibrosis

CLINICAL FEATURES OF CHOLECYSTITIS

sudden onset — more gradual & insidious onset

- Acute & chronic calculous cholecystitis have similar & variable symptoms: minimal nonspecific symptoms to biliary colics to severe RUQ pain (typical presentation; epigastric //; can be missed with chronic gastritis)
- Fever, nausea, leukocytosis. (↑WBC in peripheral blood) (+vomit)

- Acute acalculous cholecystitis: symptoms obscured by general condition (? dehydrated, bed ridden)
- **Dx: Ultrasonography**

- **Complications**: cholangitis, sepsis, GB perforation, abscess, rupture, cholecyst-enteric fistula, intestinal ileus, ... (with late dx → ascending to bile ducts; between GB & small bowel)

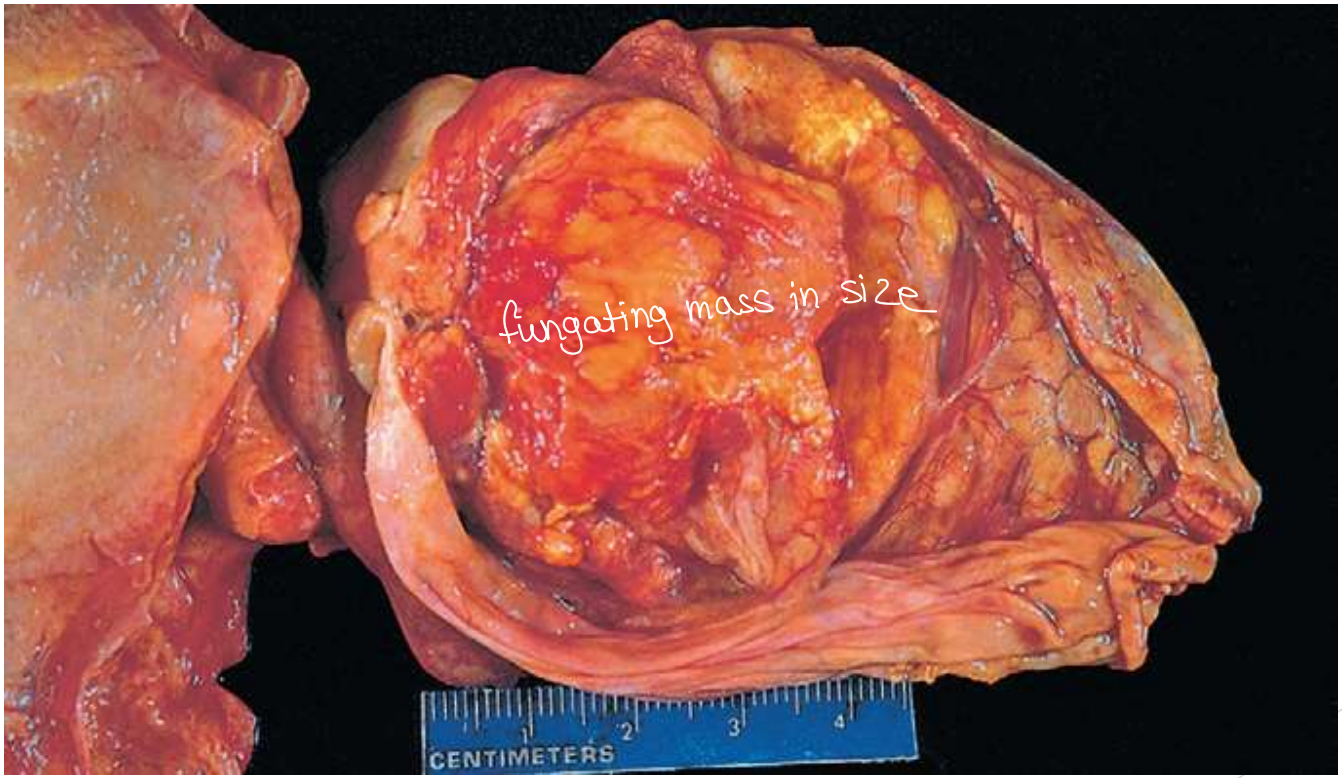
TUMORS OF THE GALLBLADDER
GALLBLADDER CARCINOMA

- Commonest extrahepatic biliary tract cancer
- More common in women; peak 7th decade
- Due to recurrent trauma and inflammation: usually associated with stones;
- Morphology: Infiltrating or fungating growth pattern
- Most are adenocarcinoma.

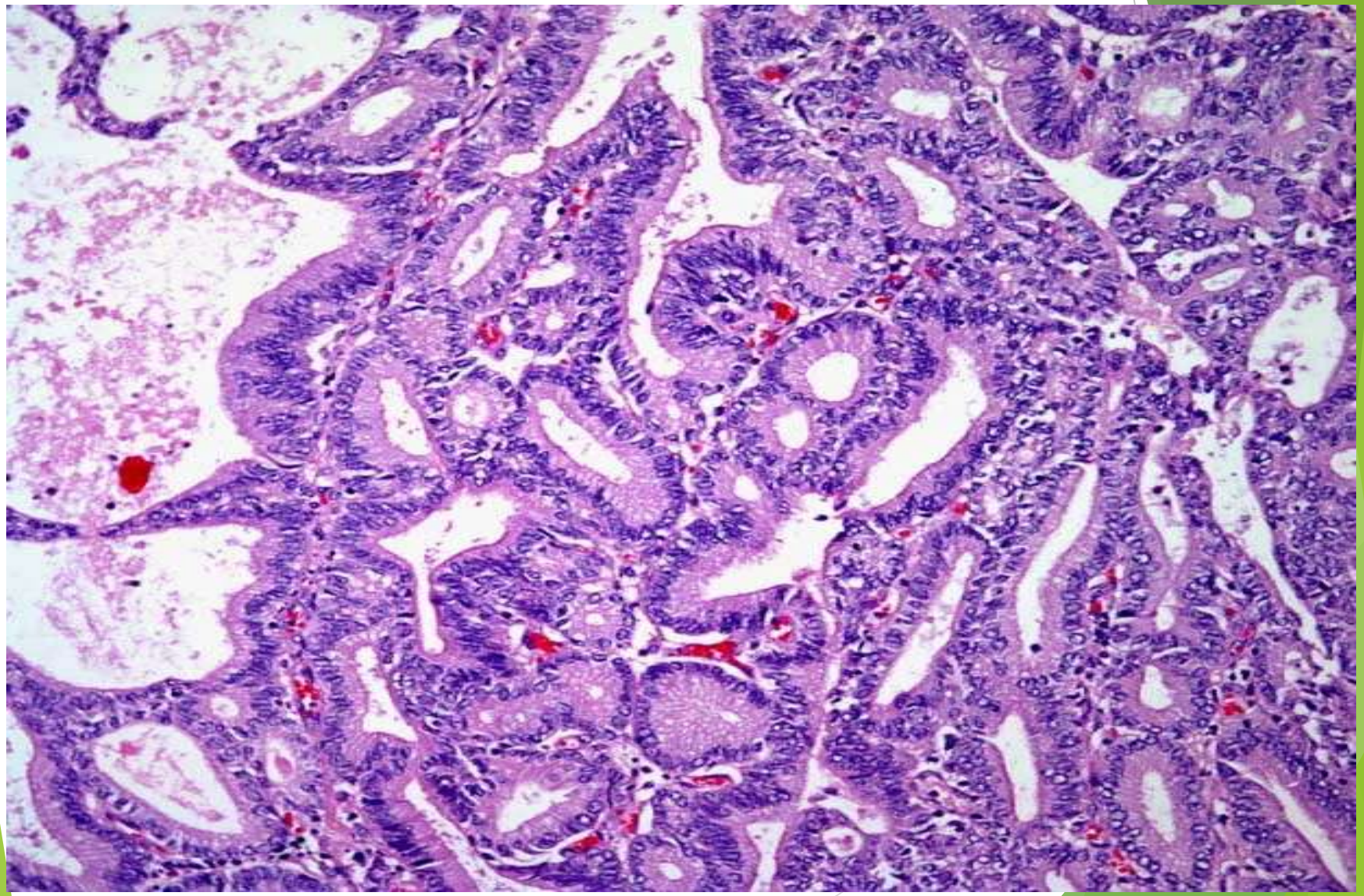
- Insidious symptoms similar to cholelithiasis
- If obstruction develops early: early diagnosis and treatment.
- Advance stage at diagnosis (late)
- Seeding to peritoneum, GIT, and lungs
- **Prognosis: dismal, 5 year survival: 1%**

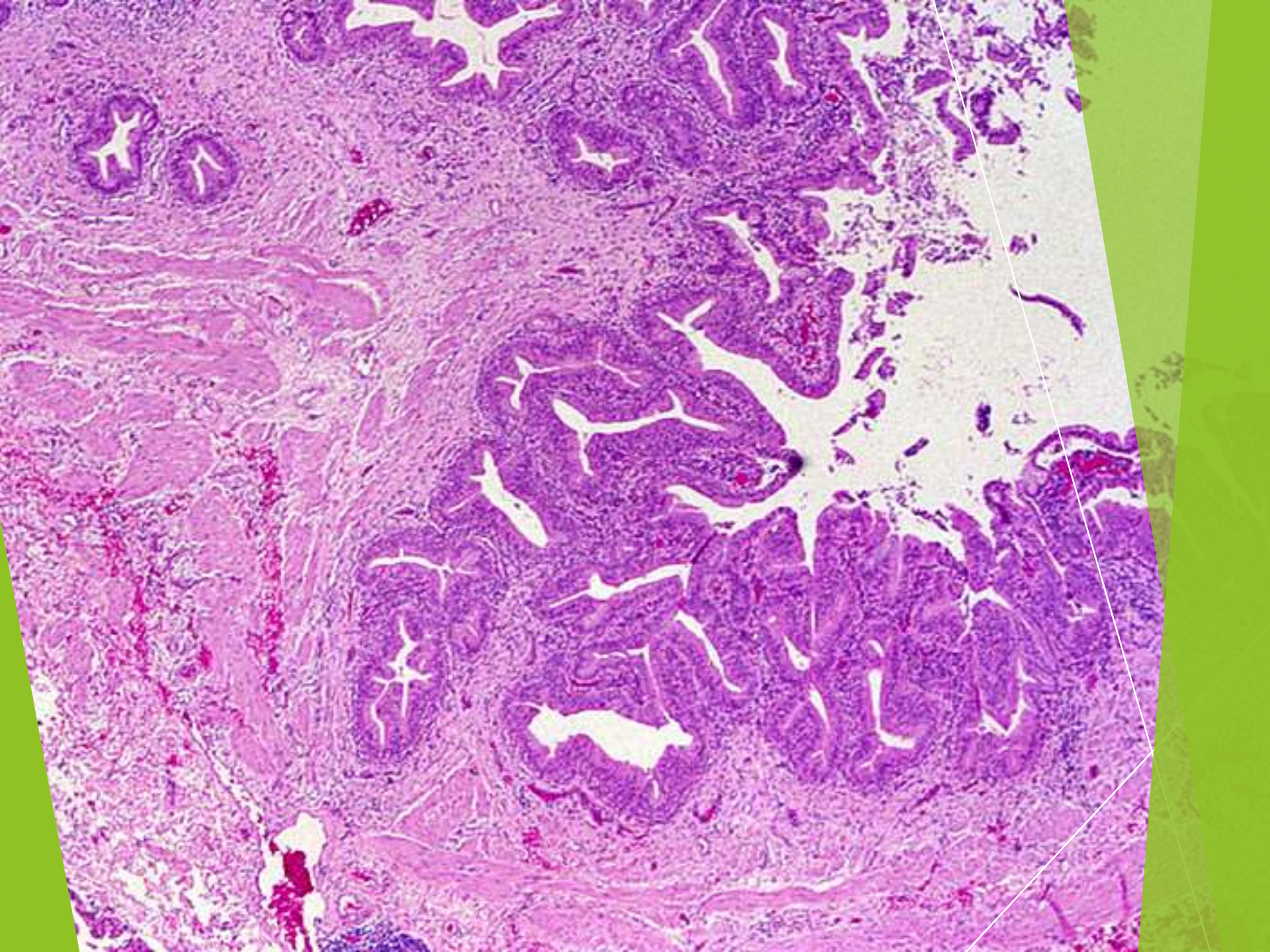
dx → mostly incidental finding during examination of GB removed for acute or chronic cholecystitis's

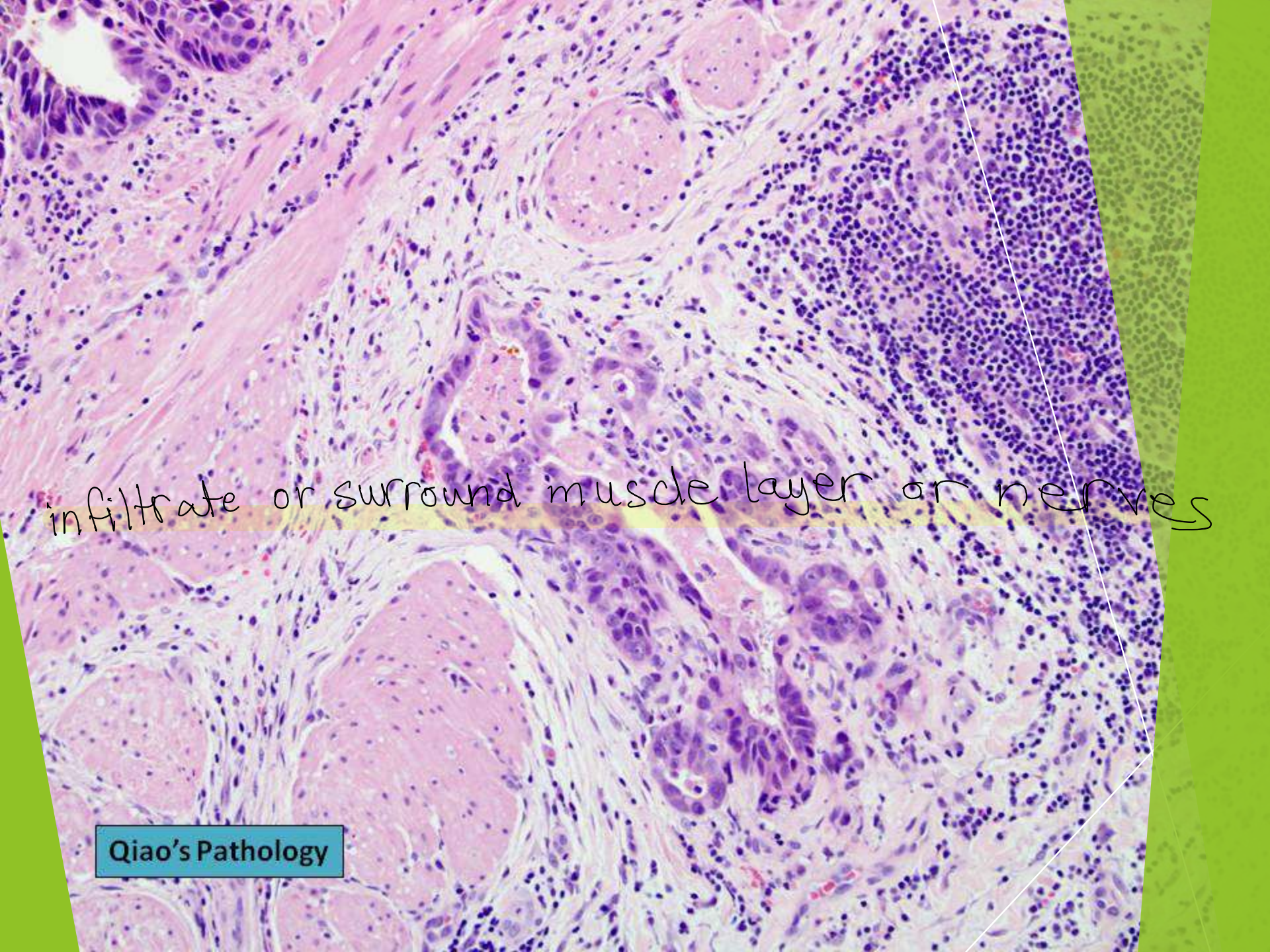
Bad tumor, discovered late

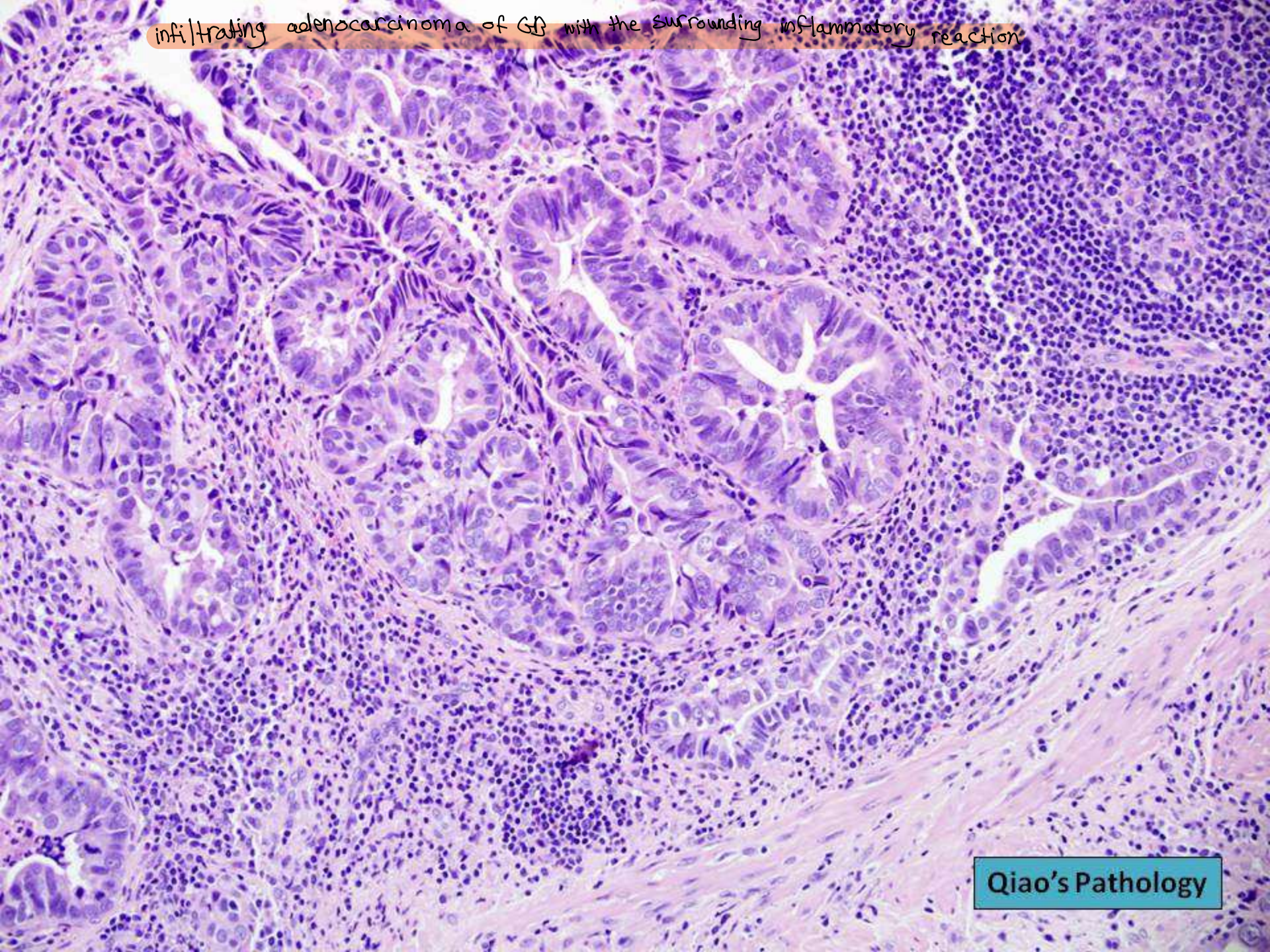


adenocarcinoma usually infiltrates walls & muscles wall of GB






infiltrate or surround musde layer or nerves
Qiao's Pathology


infiltrating adenocarcinoma of GB with the surrounding inflammatory reaction
Qiao's Pathology