Liver infections

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Hepatic Cysts

- *hepatic cyst usually refers to solitary nonparasitic cysts of the liver, also known as simple cysts*
- estimated to occur in 5% of the population. No more than 10-15% of these patients have symptoms

- Types of Cysts:
  - simple cysts
  - multiple cysts arising in the setting of polycystic liver disease (PCLD),
  - parasitic or hydatid (echinococcal) cysts,
  - cystic tumors, and
  - abscesses.

- Ductal cysts, choledochal cysts, and Caroli disease are differentiated from hepatic cysts by involvement of the bile ducts

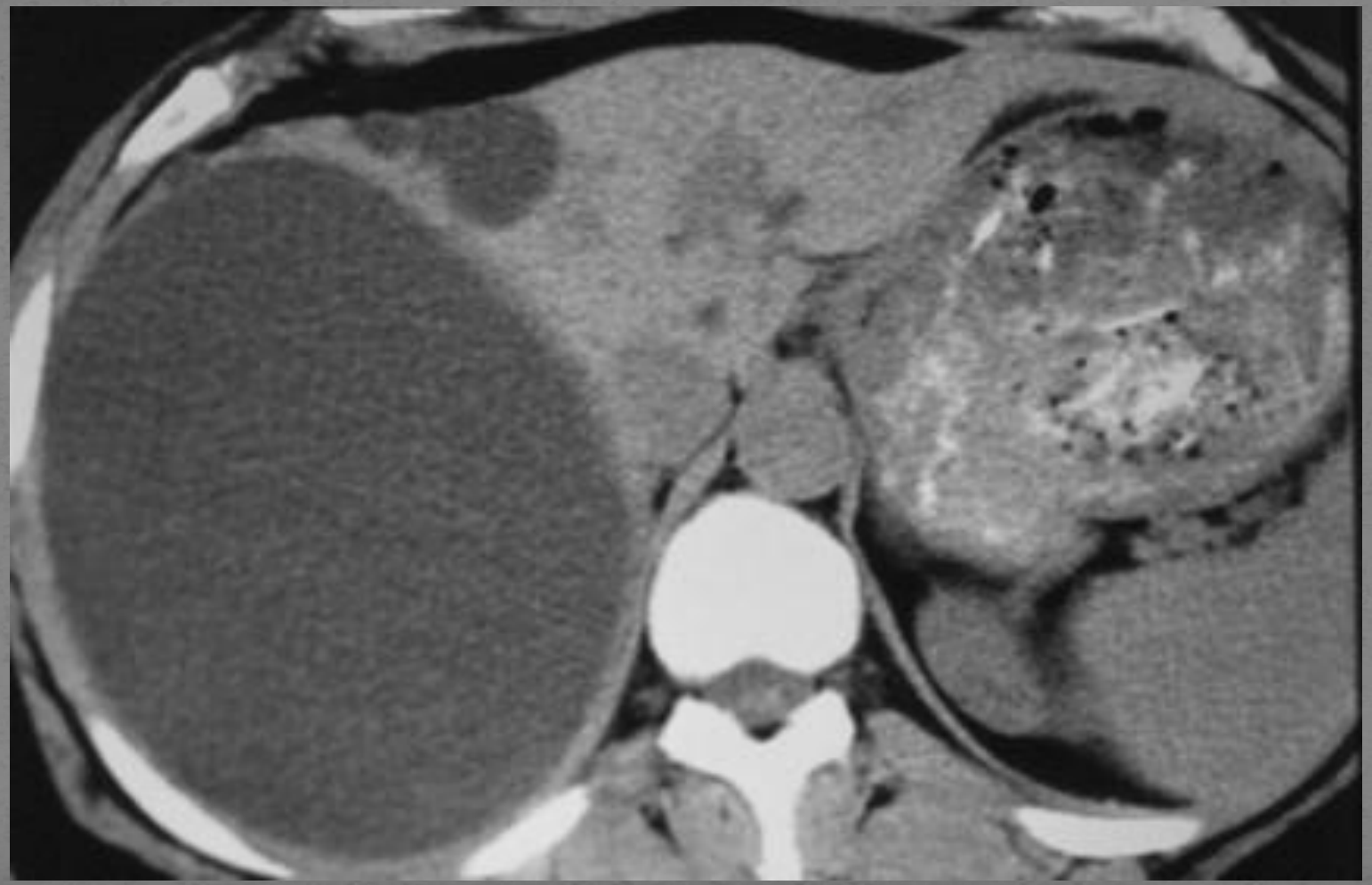
Classification of Cystic Hepatic Lesions

- I. Infectious hepatic cysts
  - A. Pyogenic liver abscess
  - B. Amebic liver abscess
  - C. Hydatid liver cysts
- II. Congenital hepatic cysts
  - A. Simple cysts
  - B. Polycystic liver disease
- III. Neoplastic hepatic cysts
  - A. Cystadenoma
  - B. Cystadenocarcinoma
- IV. Traumatic hepatic cysts

Simple cysts

- cause is not known
- believed to be congenital in origin
- lined by biliary-type epithelium
- seldom contain bile
- fluid has an electrolyte composition that mimics plasma.
- Bile, amylase, and white blood cells are absent.
- The cyst fluid is continually secreted by the epithelial lining of the cyst.
- For this reason, needle aspiration of simple cysts is not curative.

CT scan appearance of a large hepatic cyst

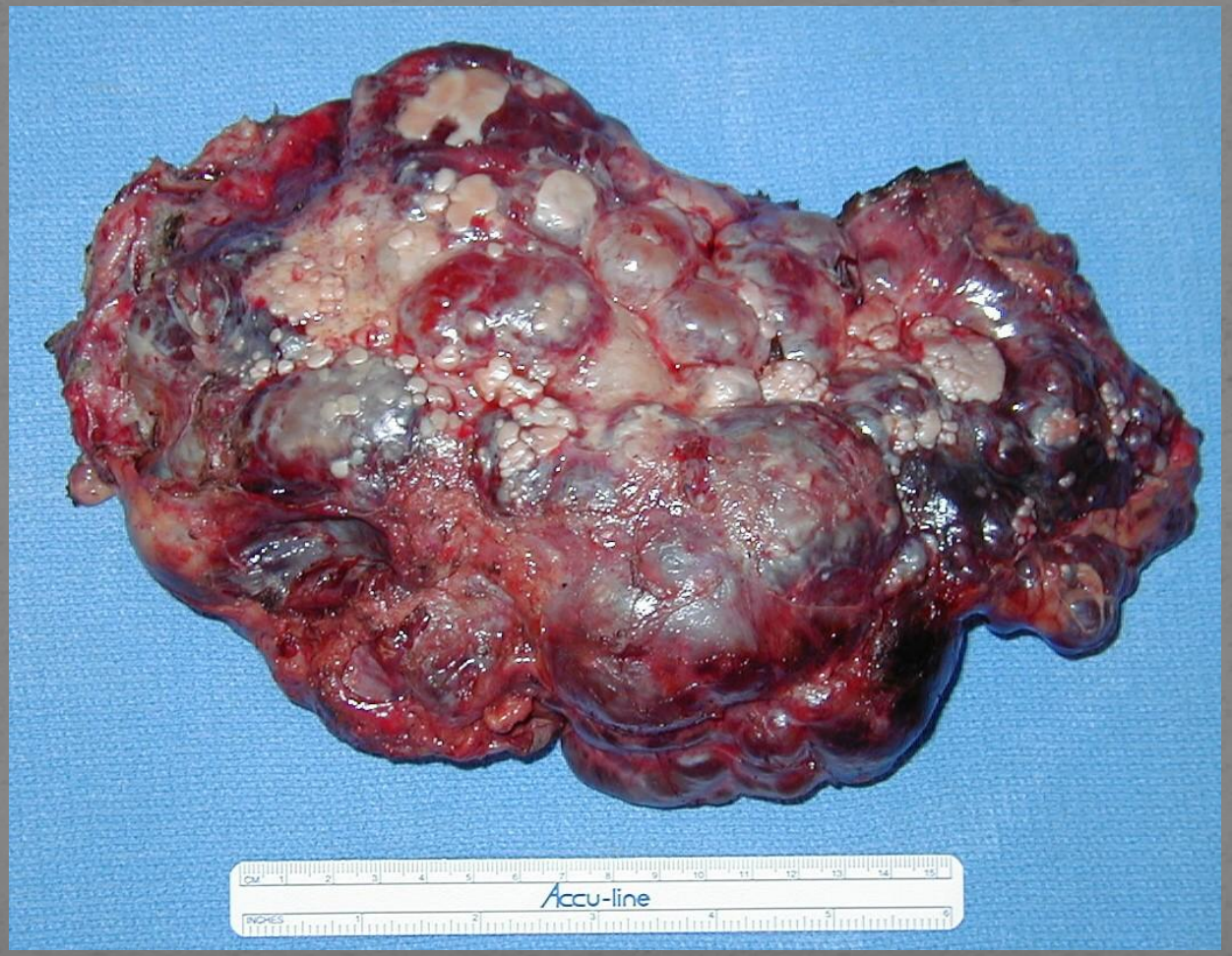


Polycystic liver disease

- Adult polycystic liver disease (AD-PCLD) is congenital
- usually associated with autosomal dominant polycystic kidney disease (AD-PKD).
- Mutations in these patients have been identified in *PKD1* and *PKD2* genes.
- Occasionally, PCLD has been reported in the absence of polycystic kidney disease(PKD).
- In patients with PKD, the kidney cysts usually precede the liver cysts. PKD often results in renal failure,
- whereas liver cysts only rarely are associated with hepatic fibrosis and liver failure.

CT scan of polycystic liver disease curiously limited to the right lobe

Resection of involved liver in polycystic liver disease



Neoplastic cysts

- Cystadenoma most often occurs in middle-aged women.
- However, in cystadenocarcinoma M = F
- Most patients are asymptomatic
- have vague abdominal complaints of bloating, nausea, and fullness.
- eventually present with abdominal pain.
- Rarely, they present with evidence of biliary obstruction.

Hydatid Liver Cyst

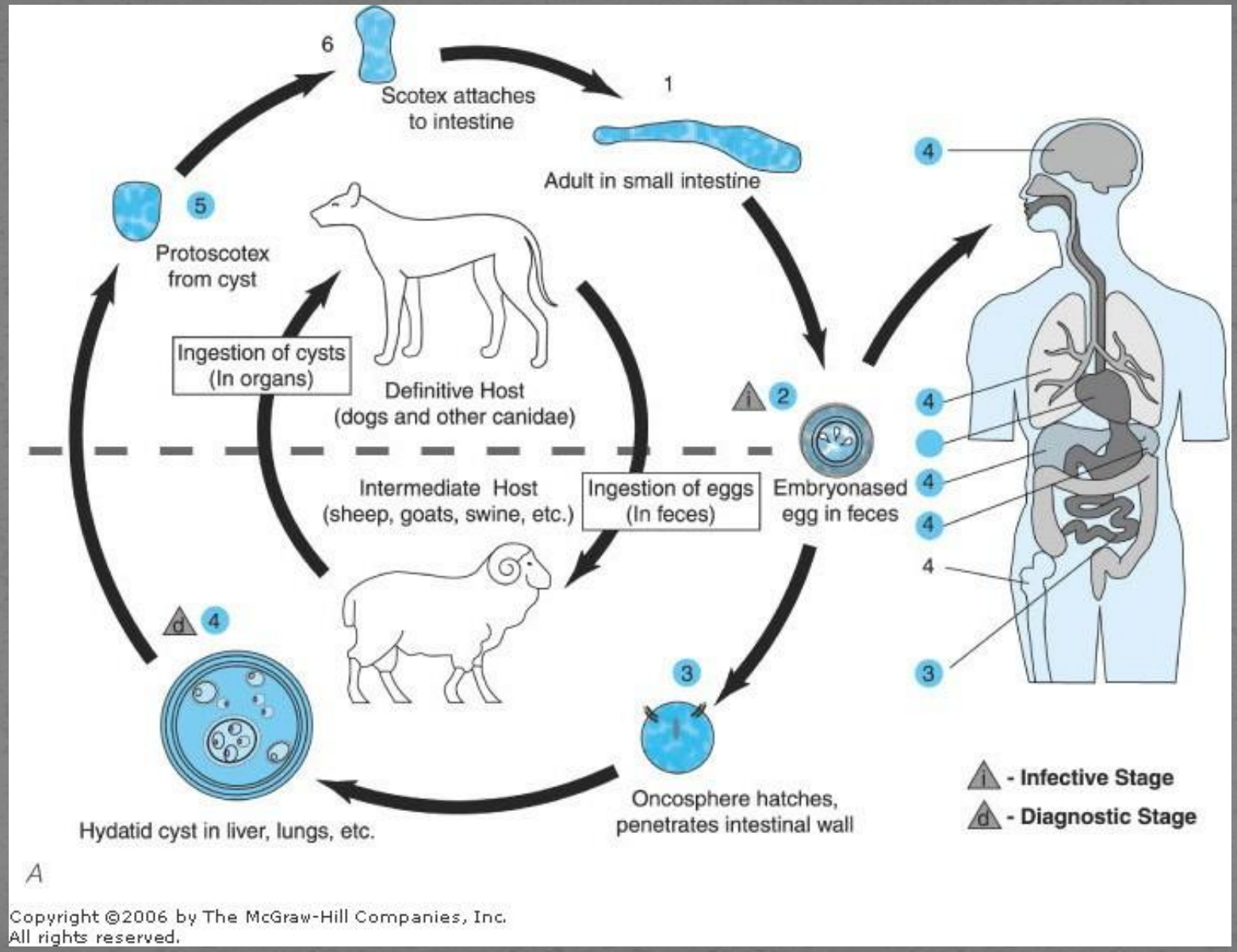
- Echinococcosis (hydatid disease) is a zoonosis

- caused by the larval stage of *Echinococcus granulosus* (also known as *Taenia echinococcus*).
- Humans are accidental intermediate hosts,
- whereas animals can be both intermediate hosts and definitive hosts.

- is the most common cause of liver cysts in the world

- The two main types of hydatid disease are caused by
  - *E. granulosus* and
  - *E. multilocularis*.

- *E. granulosus* is commonly seen in the Mediterranean, South America, the Middle East, Australia, and New Zealand,
- *E. granulosus* is the most common type of hydatid disease in humans.
  - 50–75% of the cysts occur in the liver,
  - 25% are located in the lungs, and
  - 5–10% distribute along the arterial system.



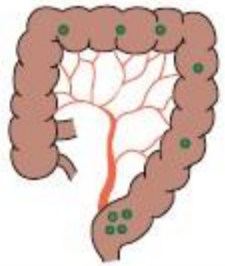
DEFINITE HOST – DOG

Sheep liver containing hydatid cyst eaten by dog

Scolices enter small intestine of dog

Scolices adhere to mucosa and develop into adult *Taenia echinococcus*

Ova of *Taenia* pass into canine faeces



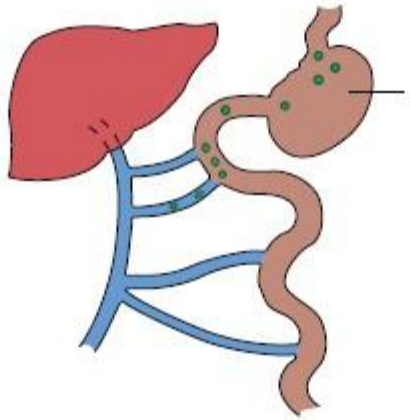
INTERMEDIATE HOST – SHEEP AND MAN

Grass ingested by sheep

Canine faeces

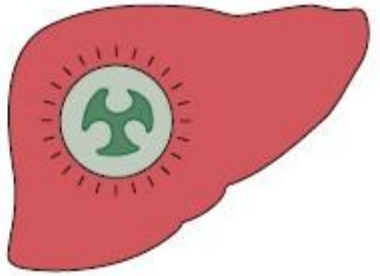
Saliva and coat of dog ingested by man

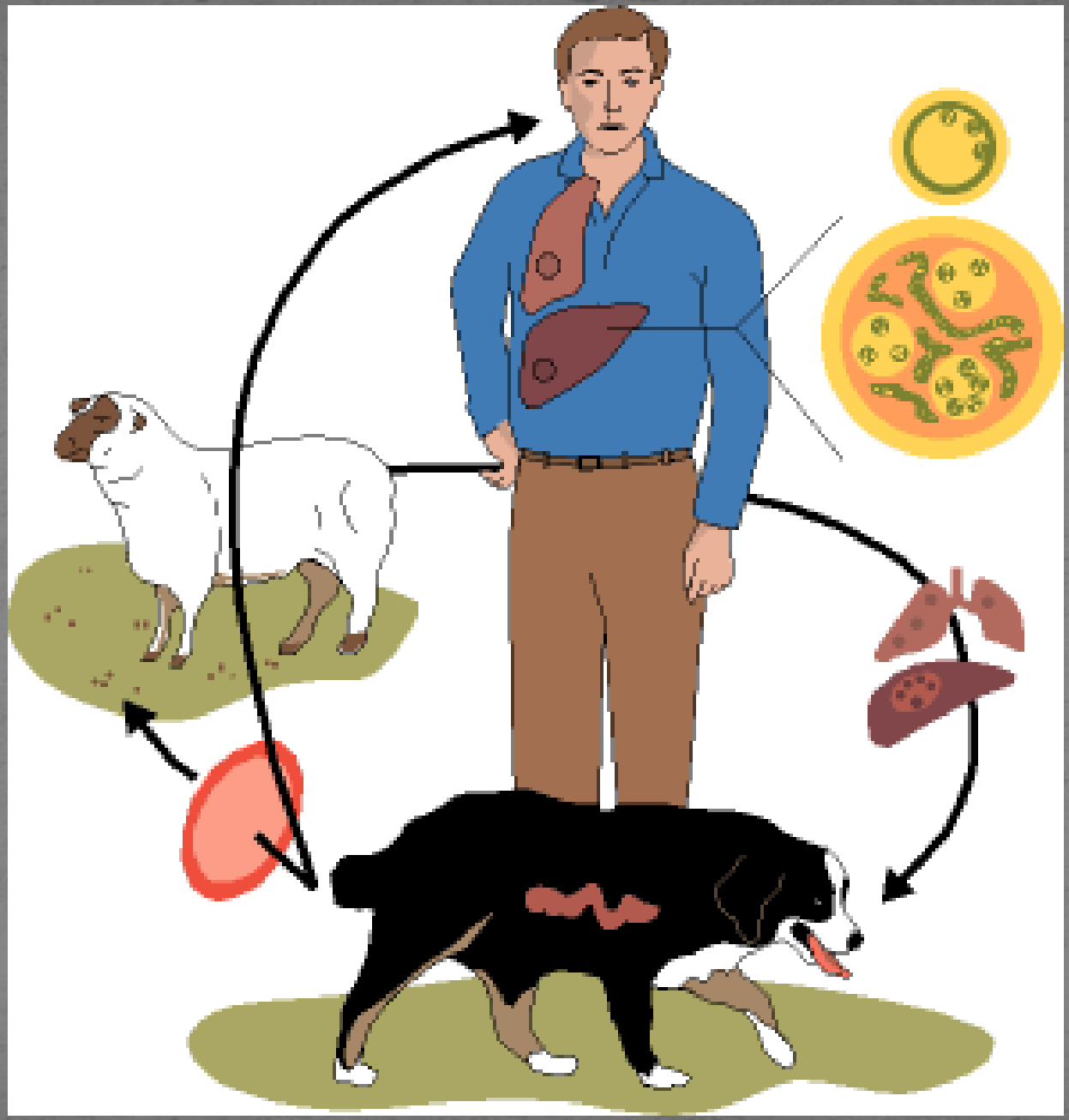
Ova pass via portal system from intestine to liver



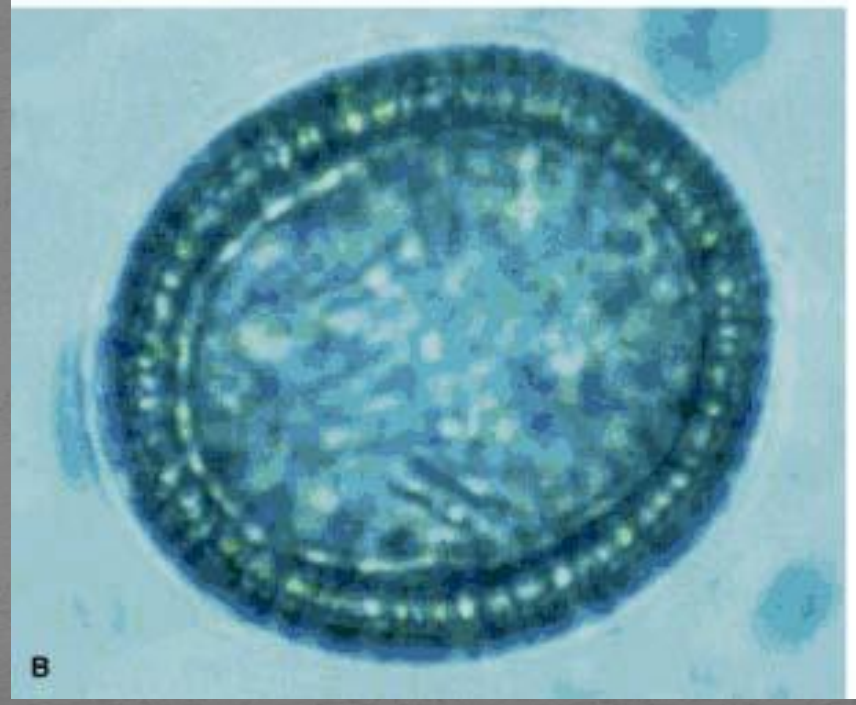
HCl + pepsin dissolve chitinous envelope

Adult hydatid cyst develops in liver

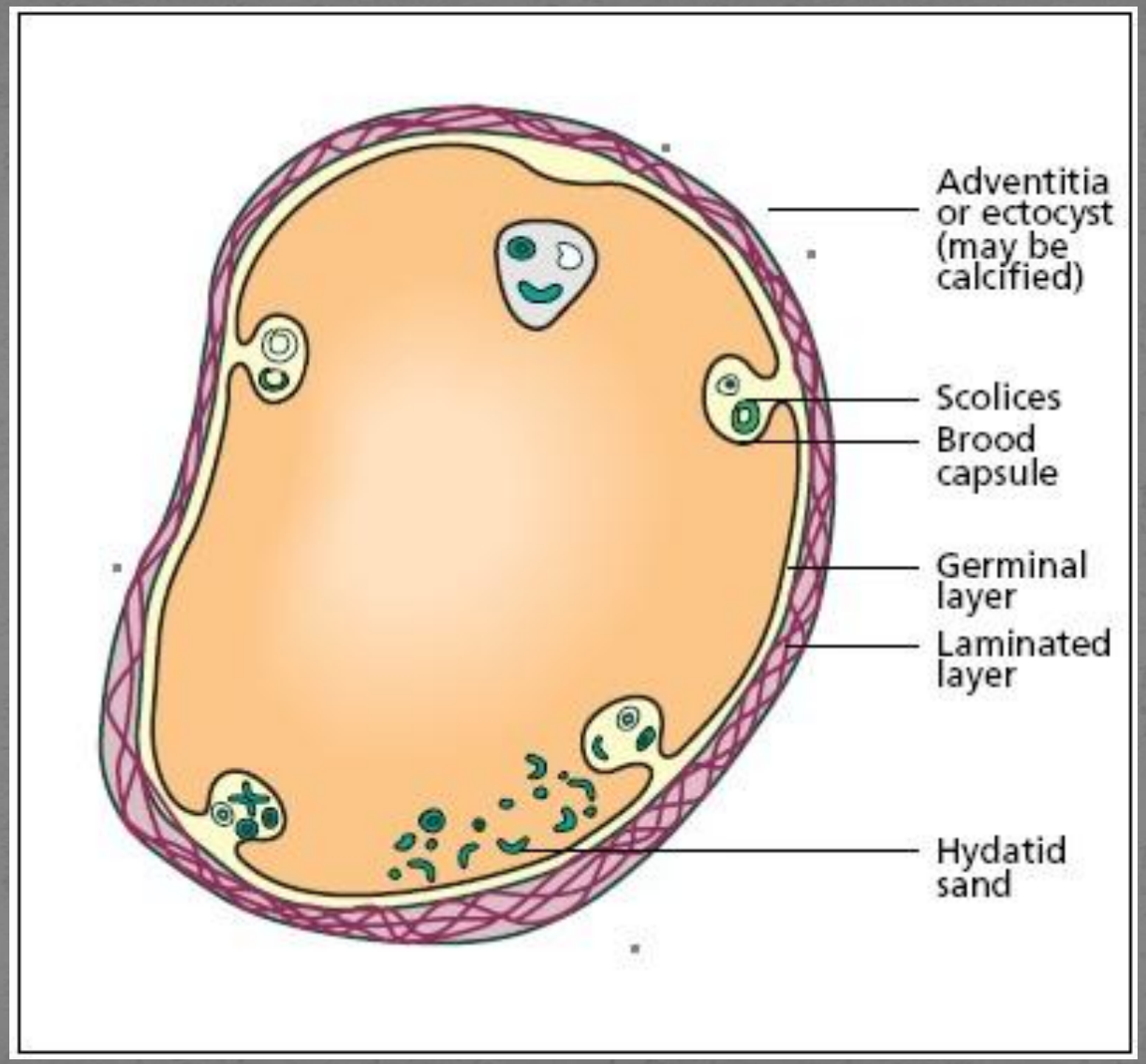




A: Cestode (adult parasite) of Echinococcus granulosus showing the head with its suckers and hooklets,
B: The egg (oophore) eliminated by the adult worm.
C: Brood capsule with protoscoleces.



The basic constitution of a hydatid cyst.



- affects all age groups,
- both sexes equally
- cysts grow to 1 cm in the first 6 months
- and 2–3 cm annually thereafter, depending on host tissue resistance.
- parasite passes through the intestinal wall into the portal venous or lymphatic system,
- the liver acts as the first line of defense, and thus is the most frequently involved organ.

Ultrasonic image of *E. granulosus* in the liver, showing many daughter cysts within the main cyst.

Pathology

- cysts tend to expand slowly
- and without symptoms
- frequently very large on presentation.
- Single lesions are noted in 75% and are predominantly located within the right lobe (80%).
- Even though the lesion is single, 50% contain daughter cysts and are multilocular.
- The typical hydatid cyst has a three-layer wall surrounding a fluid cavity.
  - The outer layer is the *pericyst*, a thin, indistinct fibrous tissue layer representing an adventitial reaction to the parasitic infection. Over time, the pericyst calcifies
  - The outer layer of the cyst itself is the *ectocyst or laminated membrane* and is bluish-white, gelatinous, and about 0.5 cm thick.
  - The inner layer or *endocyst is the germinal membrane*

- Endocyst is responsible for the production of clear hydatid fluid, the ectocyst, brood capsules, scoleces, and daughter cysts.
- The endocyst is 10–25 microns thick and
- gives rise to brood capsules, in which future worm heads develop.
- They enlarge and develop into invaginated protoscoleces with four suckers and a double row of hooks—a protoscolex.
- Brood capsules and freed protoscoleces are released into the fluid of the original cyst and together with calcareous bodies, form hydatid sand.

- Daughter cyst formation is a defense reaction.
- Hydatid cysts in humans are long-standing, large, and liable to injury.
- Any injury may cause daughter cyst formation.
- Daughter cysts are replicas of the mother cyst, and their size and number are variable.

- In uncomplicated cysts, the cyst cavity is filled with sterile, colorless, antigenic fluid containing salt, enzymes, proteins, and toxic substances.

- The formation of daughter cysts is called endogenic vesiculation
- occurs when a small rupture or defect in the laminated membrane occurs and the germinal layer passes through and creates a satellite hydatid cyst.
- This process is uncommon in *E. granulosus*,
- but is characteristic for the larval stage of *E. multilocularis*.
  - Because the liver parenchyma in humans cannot sequester *E. multilocularis* and the process of ectogenic vesiculation is fulminant, multiple vesicles are formed in all directions.
  - The infected parenchyma has a multilocular appearance, and the center becomes necrotic, spongy, and filled with a gelatinous fluid similar to that of a mucoid liver carcinoma.
  - Hepatic insufficiency is common and the disease is often lethal

Symptoms, Signs, and Laboratory Data of Hydatid Liver Cysts

SYMPTOMS	% of Hydatid Cysts
Asymptomatic	75%
Abdominal pain	20%
Dyspepsia	13%
Fever and chills	8%
Jaundice	6%
Signs	
Right upper quadrant mass	70%
Right upper quadrant tenderness	20%
Laboratory Data	
Eosinophilia	35%
Bilirubin >2 mg/dL	20%
WBC count <10,000/mm3	10%

Serology

- No single biochemical test definitively establishes the diagnosis.
- The *Casoni* and *Weinberg* tests are no longer used due to their low sensitivities.
- *ELISA* gives a positive result in more than 90% of patients.
- Specific IgE antibodies are demonstrated with ELISA and radioallergosorbent test (RAST) if active disease is present.
- The *arc 5 antibody test* involves precipitation during immunoelectrophoresis of the blood of patients with the antigen. Positivity for this test is 91%.
- purified fractions enriched in antigens 5 and B and glycoproteins from hydatid fluid yielded a sensitivity of 95% with a specificity of 100%.

Radiology

- Chest radiographs –
  - elevated diaphragm
  - concentric calcifications in the cyst wall, but are of limited value.
- Ultrasound and CT are considered the first choice for imaging
- Classic findings of hydatid cysts are
  - calcified thick walls,
  - often with daughter cysts
- Ultrasound defines the internal structure, number, and location of the cysts and the presence of complications.
- The specificity of ultrasound in hydatid disease is around 90%

Gharbi classification based on USG findings provides a morphologic description.

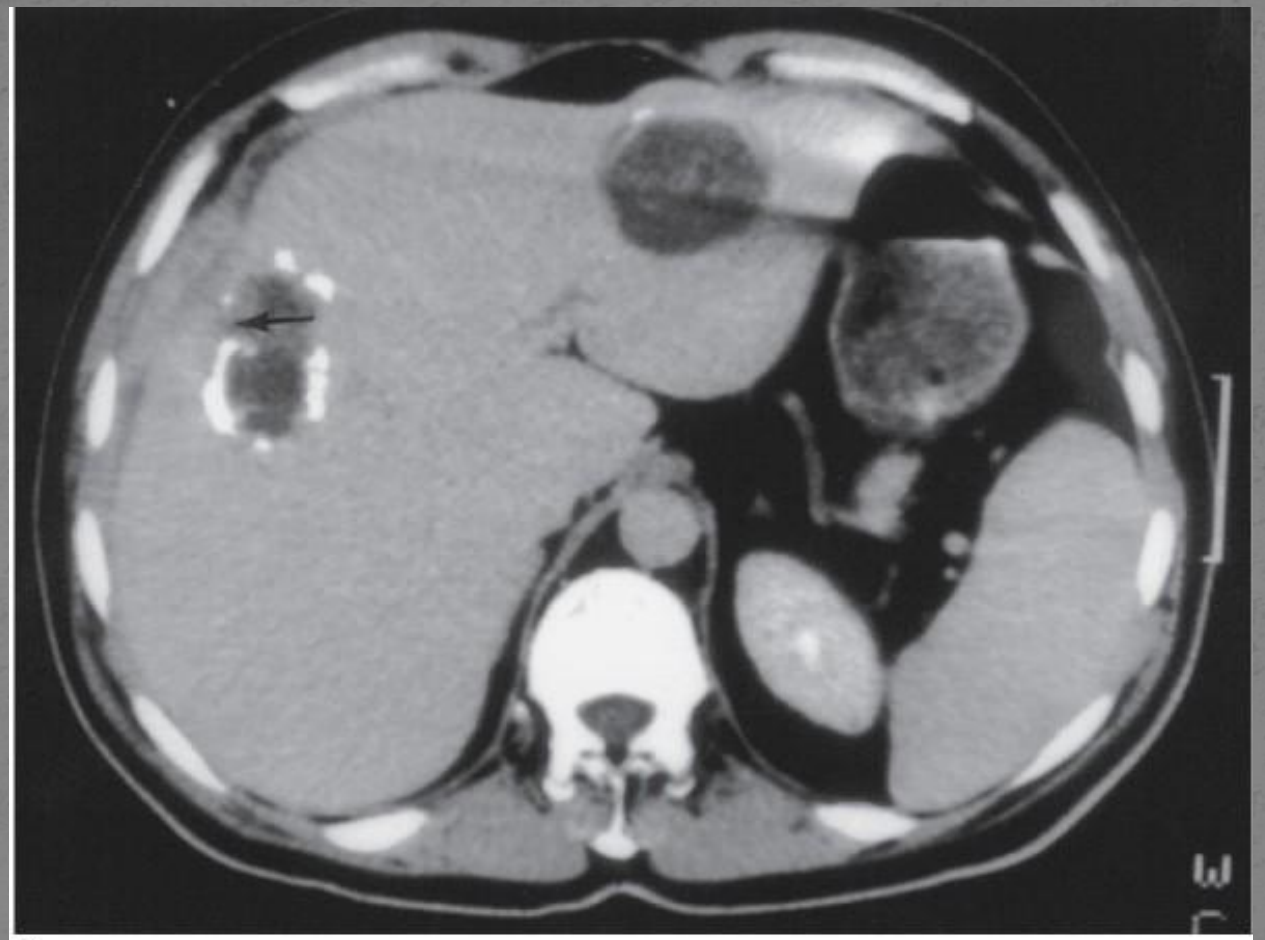
- Type I has a pure fluid collection.
- Type II has a fluid collection with a split wall (floating membrane).
- Type III reveals a fluid collection with septa (honeycomb image).
- Type IV has heterogenous echographic patterns and
- Type V has reflecting thick walls

- Computed tomography
  - gives more specific information about the location and depth of the cyst within the liver.
  - Daughter cysts and exogenous cysts are also clearly visualized, and the volume of the cyst can be estimated.
- CT is imperative for operative management, especially when a laparoscopic approach is utilized.

- MRI provides structural details of the hydatid cyst, but adds little more than ultrasound or CT, and is more expensive.

- Endoscopic retrograde cholangiopancreatography (ERCP) may show communication between the cysts and bile ducts and can be used to drain the biliary tree before surgery.
- The routine use of ERCP is advocated by some to completely define the bile duct anatomy and to visualize any clinically silent connections between the bile ducts and cysts

CT scan demonstrating a heavily calcified hydatid cyst (*arrow*) and a lightly calcified cyst on the left



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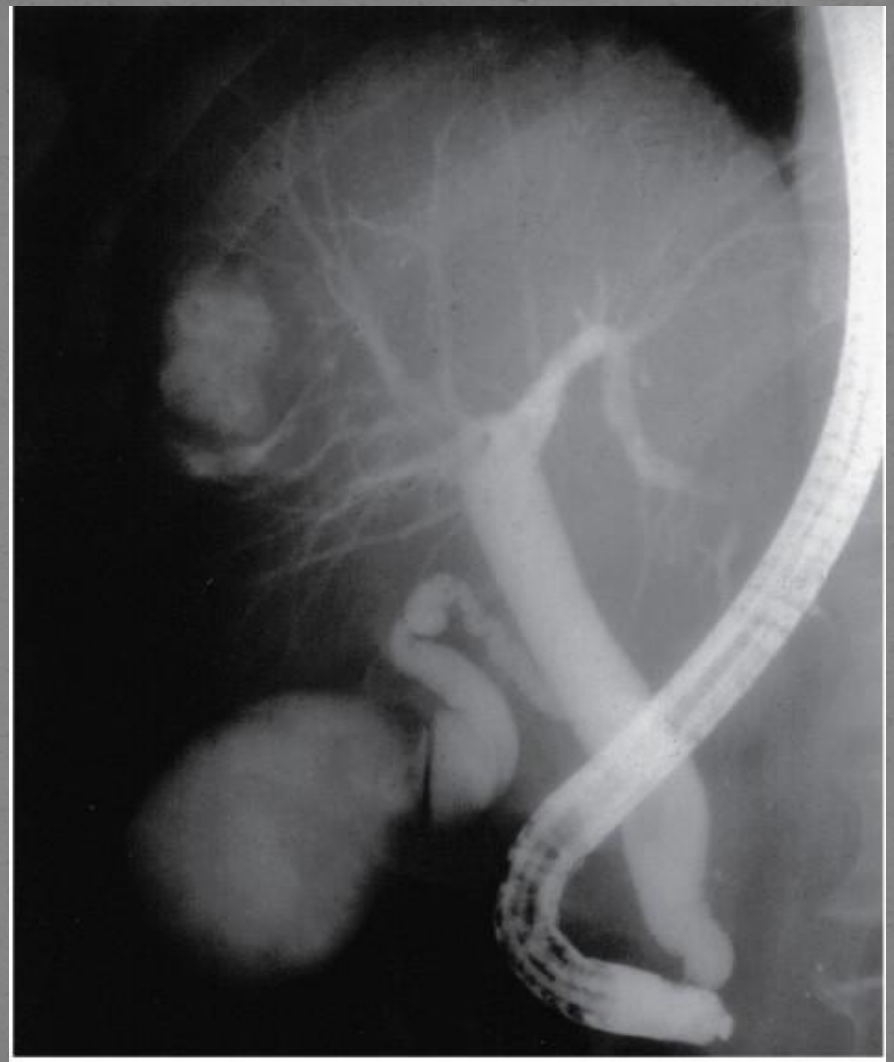
Endoscopic retrograde cholangiopancreatography in the same patient demonstrating biliary communication in the cyst



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Treatment

- Most echinococcal cysts are asymptomatic on presentation
- Complications such as
  - pulmonary infection,
  - cholangitis,
  - rupture, and
  - anaphylaxis give good reason to consider treatment for all.
- Small cysts (<4 cm) located deep in the parenchyma of the liver, if uncomplicated, can be managed conservatively.
- Basic principles of treatment are:
  - (1) eradication of the parasite within the cyst,
  - (2) protection of the host against spillage of scoleces, and
  - (3) management of complications

Anthelmintics

- Mebendazole and Albendazole
- If used alone is only 30% successful.

- Albendazole is readily absorbed from the intestine and metabolized by the liver to an active form.
- given in 4-week cycles, separated by 2-week drug-free intervals, in a dose of 10 to 15 mg/kg per day
- Albendazole is thus the drug of choice for medical therapy
- Albendazole is the only drug that is ovicidal, larvicidal, and vermicidal

- Praziquantel, has been used in combination with albendazole.
- Given for at least 3 months preoperatively,
  - albendazole reduces the recurrence rate when cyst spillage, partial cyst removal, or biliary rupture has occurred.

- Duration of therapy in these instances is at least 1 month

- Mebendazole is poorly absorbed and is inactivated by the liver.
- 400 to 600 mg daily for 3 to 4 weeks.
  - Greater success rates may be seen in extrahepatic manifestations of the disease and with the alveolar form caused by *E. multilocularis*.

- Indications of antihelminthic therapy
  - (i) inoperable patients with primary liver hydatidosis,
  - (ii)patients with multiple cysts in two or more organs,
  - (iii)multiple small liver cysts,
  - (iv) cysts deep in liver parenchyma,
  - (v) prevention and management of secondary hydatidosis,
  - (vi) management of recurrent hydatidosis,
  - (vii) unilocular cysts in theunfit elderly patients,
  - (viii) in combination with surgery and interventional procedures,
  - (ix) pulmonary echinococcosis, and
  - (x)long-term administration for cysts at specific sites (such as bone, brain, eye)

- Contraindications
  - (i) large cysts,
  - (ii) cysts with multiple septa divisions (honeycomblike cysts),
  - (iii) cysts that are prone to rupture (superficial), (iv) infected cysts,
  - (v) inactive cysts,
  - (vi) calcified cysts,
  - (vii) severe chronic hepatic disease,
  - (viii) bone marrow depression, and
  - (ix) early pregnancy.

Surgery

- Surgery is still the treatment of choice for uncomplicated hydatid disease of the liver.
- The objectives of surgical treatment are to:
  - (1) inactivate the scoleces,
  - (2) prevent spillage of cyst contents,
  - (3) eliminate all viable elements of the cyst, and
  - (4) manage the residual cavity of the cyst.

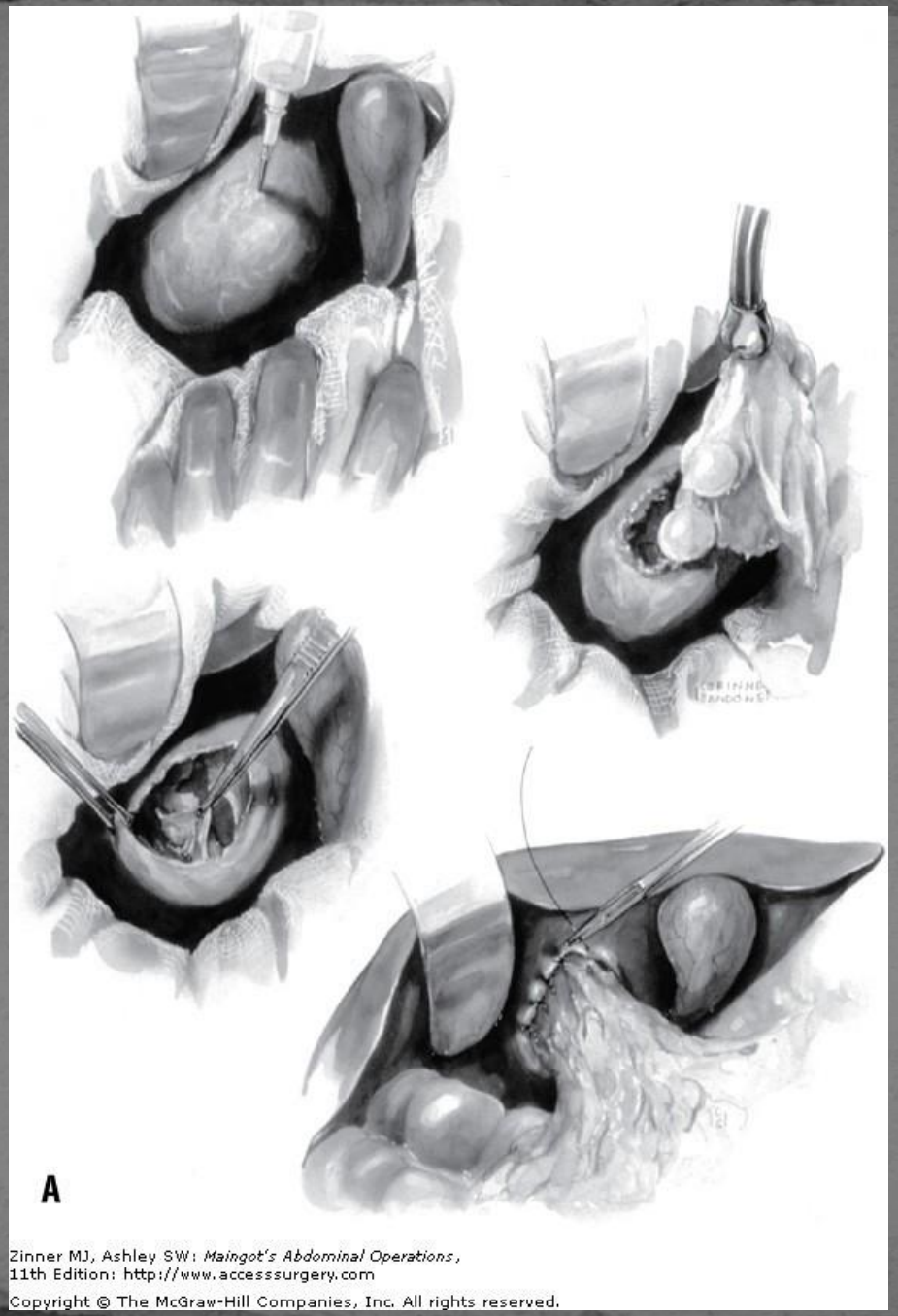
- The surgical procedure varies from

  - a radical resective open approach
    - pericystectomy or
    - hepatic resection
  - a conservative approach
    - Percutaneous Drainage of Hydatid Cysts (PAIR)
    - Open drainage
    - obliteration of the cavity or both
    - can potentially even be done laparoscopically

Percutaneous Drainage of Hydatid Cysts (PAIR)

- The PAIR procedure includes the following steps:
  - (i) percutaneous puncture of the cyst,
  - (ii) aspiration of cyst fluid,
  - (iii) injection of a protoscolicidal agent, and
  - (iv) reaspiration of the cyst content after 15 to 20 minutes

- PAIR is usually performed under US or CT guidance .
- Local anesthesia is administered.
- The cyst is punctured through the thickest possible transhepatic route using a cholangiography needle (18- to 22-gauge) or transhepatic catheter needle (No. 5 French).
- The cyst is entered through the nondependent wall to avoid the sediment rich in protoscoleces.
- About 30% to 50% of the cyst volume is aspirated.
- Radio-opaque contrast is injected into the cyst cavity in order to opacify the cyst and to detect Cysto Biliary Communication.
- All daughter cysts need to be punctured in a multivesicular cyst.
- The initial protoscolicidal substance (usually hypertonic NaCl, 15% to 20%) is not injected if CBC is demonstrated.
- The cyst is completely reaspirated after 15 to 20 minutes.
- A sclerosant (usually alcohol) is then injected.
- If the cyst diameter is more than 6 cm prior to injection of the sclerosant, a drainage catheter is inserted for 24 hours



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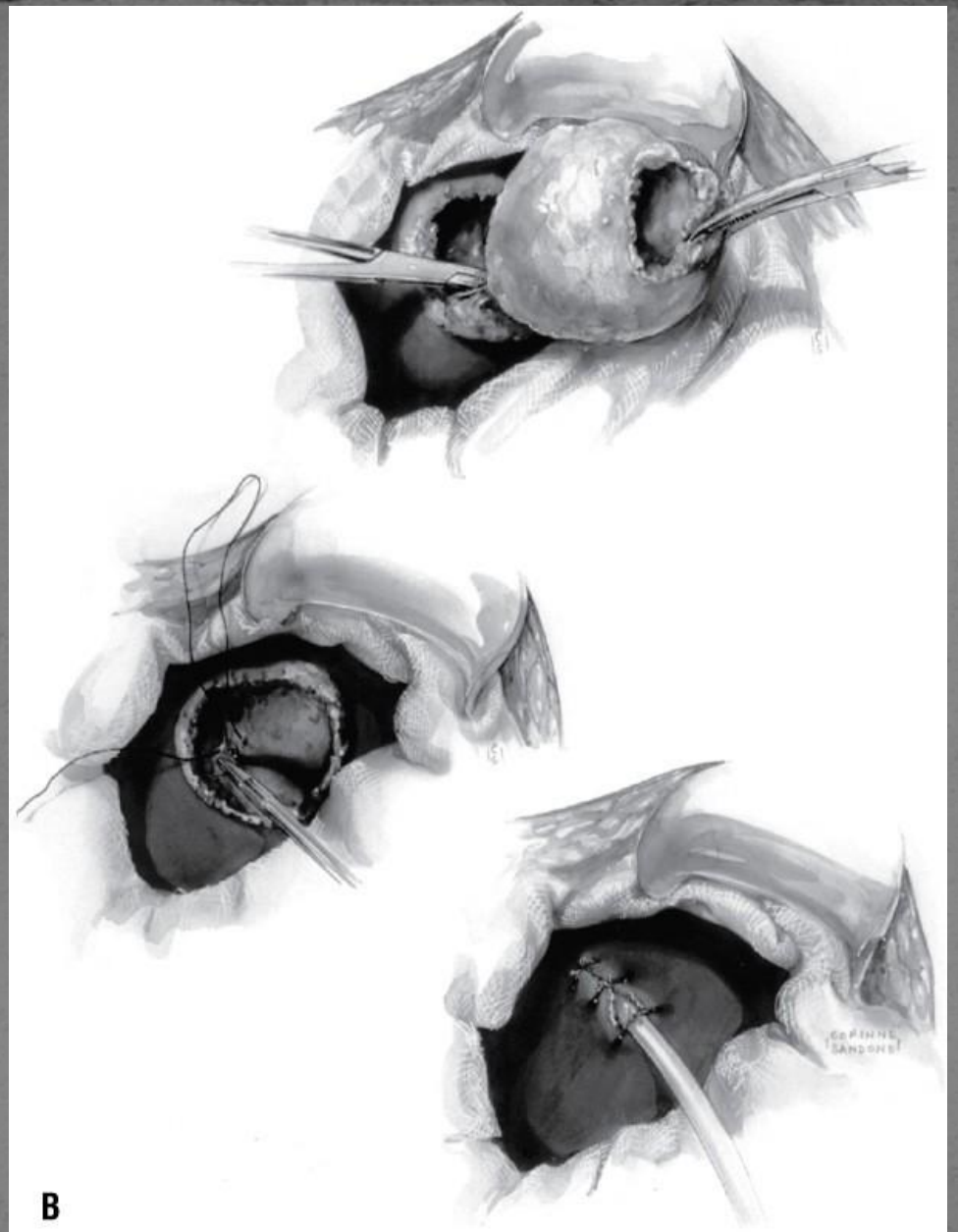
- Open cyst evacuation demonstrating cyst aspiration (*upper left*),
- removal of daughter cysts (*upper right*),
- resection of active cyst lining (*lower left*), and
- packing with omentum (*lower right*).



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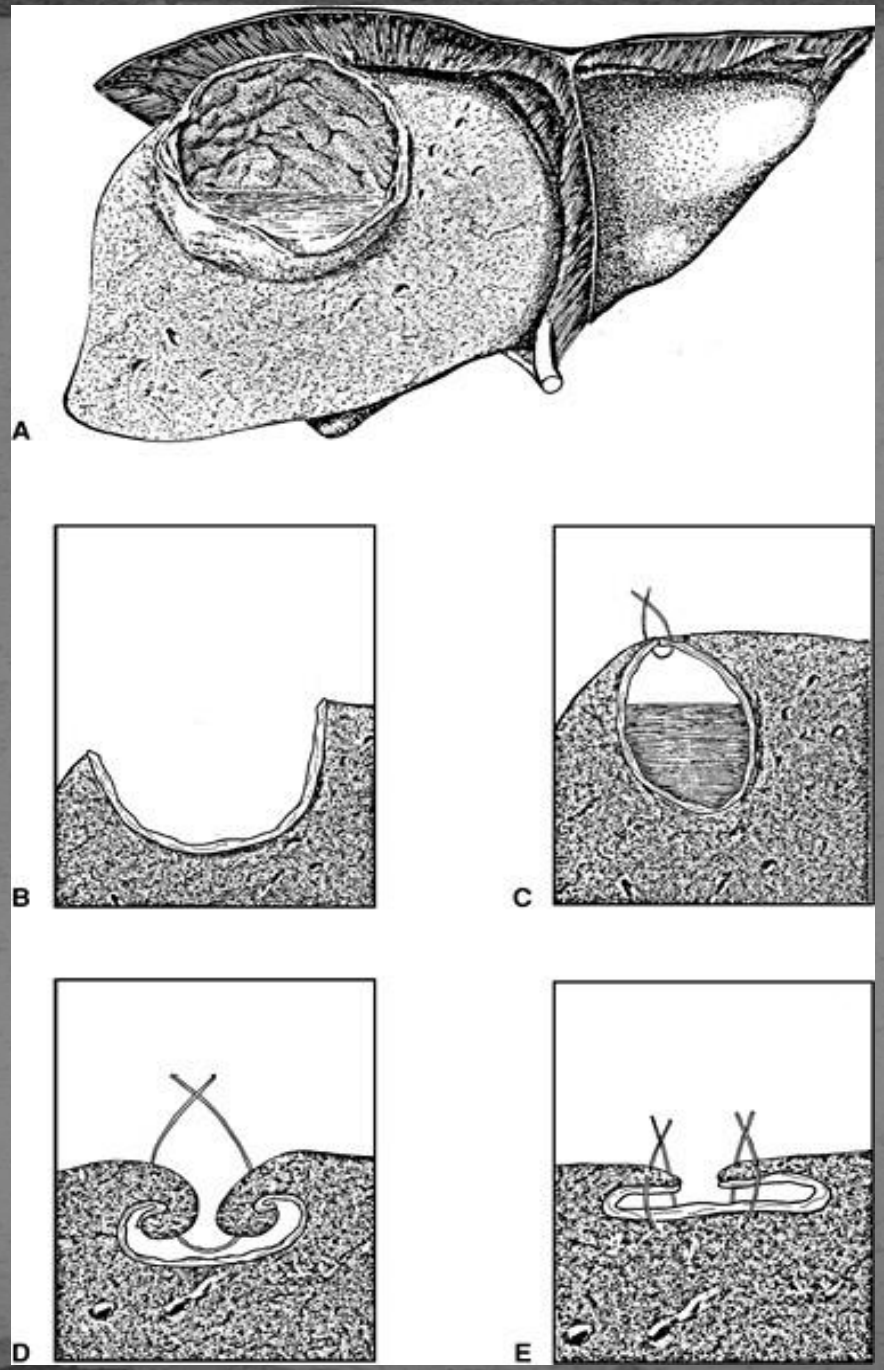
- Pericystectomy demonstrating
- removal of a calcified pericyst (*top right*),
- closure of a small bile duct (*middle left*), and
- closure of the cavity over a drain (*lower right*).



- **Management of the residual cavity.**

- *A: The pericyst cavity after removal of the parasite with accumulation of fluid.*
- *B: The pericyst cavity left open. This is applicable to small andshallow cavities.*
- *C: Simple closure of the cyst cavity. The cavity can be filled with saline.*
- *D: Introflexion of the rim of the pericyst cavity. Suture does not engage the bottom of the cavity.*
- *E: Capitonnage. There is spiral suturing from the bottom of the cavity upward.*

Aarons suction cone, is placed on top of the cyst and adheres to its surface when suction is applied to a grooved inferior rim via a side arm

Scolecidal Agents

- Early on, surgical management of hydatid cysts via cyst evacuation resulted in a high rate of peritoneal implantation.
- This problem prompted the use of scolecidal agents for injection into the cyst and for use in the surrounding peritoneum.
- Formalin,
- hypertonic saline,
- cetrimide,
- hydrogen peroxide,
- polyvinylpurrolidone-iodine,
- silver nitrate, and
- ethyl alcohol

- However, formalin caused sclerosing cholangitis when it entered the biliary tract.
- Hypertonic saline has to be used carefully to avoid biliary injection and hypernatremia.
- The safety of the other agents in the biliary tree has not been established.
- No agent should be injected pre-evacuation due to high intracyst pressure

Complications

- Complications from hydatid cysts are seen in one-third of patients.
- Most commonly, the cyst ruptures internally or externally, followed
- by secondary infection,
- anaphylactic shock, and
- liver replacement, in order of decreasing frequency.

- Viable hydatid cysts are space-occupying lesions with a tendency to grow.
- symptoms depend on the site and size of the cyst.
- Symptoms result from direct pressure or distortion of neighboring structures or viscera.

- As the cysts enlarge, they may also rupture.
- If rupture of only the endocyst occurs, the content is retained within the pericyst.
- A communicating rupture is a rupture into the biliary or bronchial tree.
- Frank intrabiliary rupture is the most common complication of hydatid cysts, and is reported in 5–25% of cases.
- T-tube drainage, cystojejunostomy, and choledochoduodenostomy are the main operations performed for this pathologic condition.
- A free rupture occurs when hydatid contents rupture throughout the peritoneal, pleural, or pericardial cavity.
- Acute symptomatic rupture into the peritoneal cavity occurs in 1–4% of patients and may precipitate anaphylactic shock

Hepatic Abscess

- A. Pyogenic liver abscess
- B. Amebic liver abscess

Predisposing Factors for Pyogenic Liver Abscesses

- Children
-
- Chronic granulomatous disease
- Complement deficiencies
- Leukemia Chronic pancreatitis
- Malignancy
- Sickle cell anemia
- Polycystic liver disease
- Congenital hepatic fibrosis
- Posttransplant liver failure
- Necrotizing enterocolitis
- Chemotherapy and steroid therapy
- Acquired immunodeficiency syndrome

- Adults
-
- Diabetes mellitus
- Cirrhosis
- Chronic pancreatitis
- Peptic ulcer disease
- Inflammatory bowel disease
- Jaundice
- Pyelonephritis
- Malignancy
- Leukemia and lymphoma
- Chemotherapy and steroid therapy
- Acquired immunodeficiency syndrome

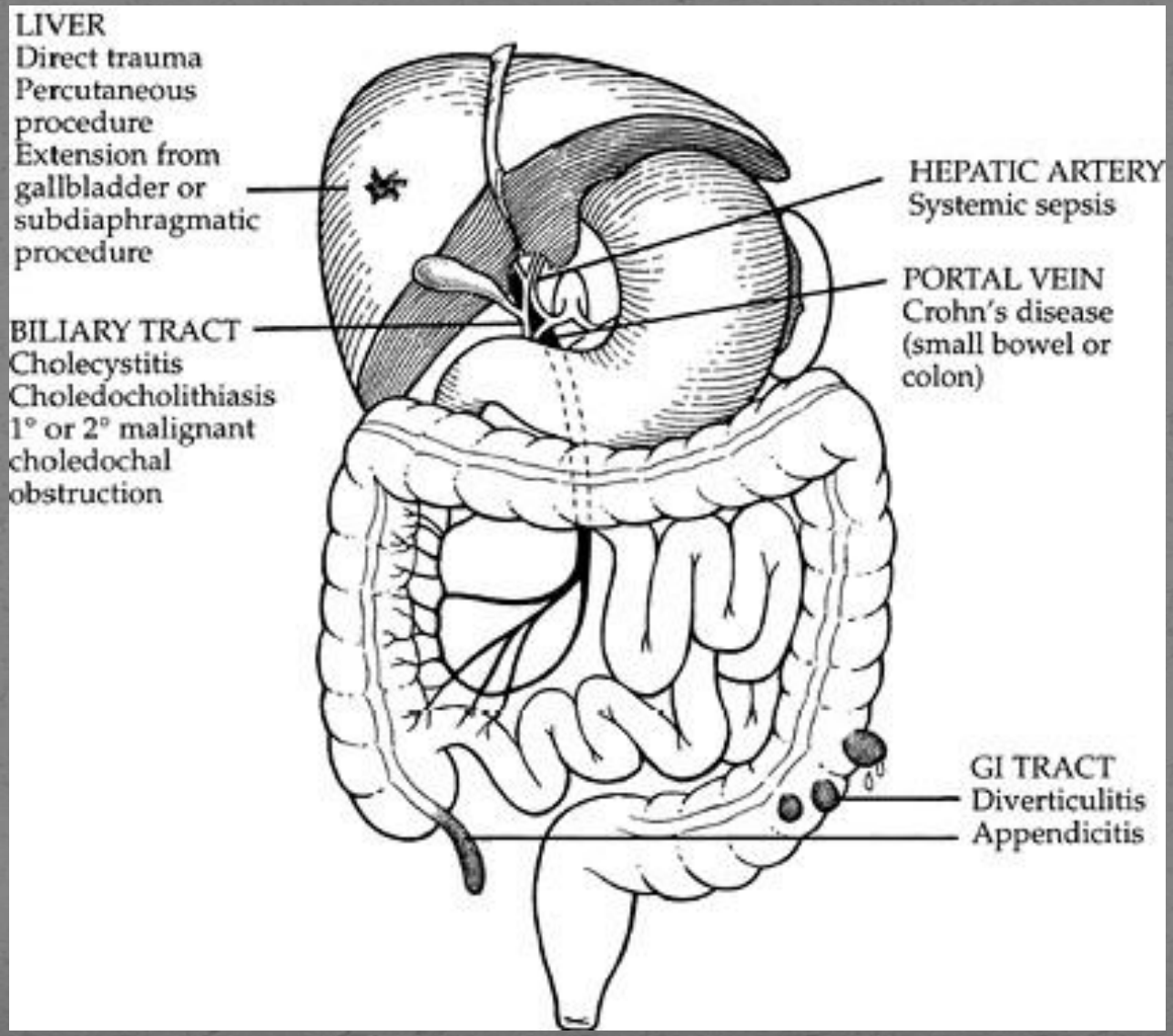
Pathology

- Portal, traumatic, and cryptogenic hepatic abscesses are solitary and large,
- Biliary and arterial abscesses are multiple and small.

- 63% of patients had abscesses involving the right lobe,
- 14% had abscesses involving the left lobe, and
- 22% had bilobar disease.

- Those with intra-abdominal infections frequently present with right lobe abscesses due to preferential flow from the superior mesenteric vein.
- Fungal abscesses are usually multiple, bilateral, and miliary.

Causes of pyogenic abscess. GI, gastrointestinal.



Bacteriology

- Confirmation of pyogenic liver abscess involves
- aspiration of the abscess as well as
- positive blood cultures.
- Abscess cultures are positive for growth in the majority (80–97%), whereas
- blood cultures are positive in only 50–60% of cases.

- Most common aerobic organisms
  - *Escherichia coli*,
  - *Klebsiella* species,
  - enterococci, and
  - *Pseudomonas*

- Most common anaerobes :
  - *Bacteroides* species,
  - anaerobic streptococci, and
  - *Fusobacterium*

- use of indwelling biliary stents as the cause of an increasing incidence of *Klebsiella*, streptococcal, staphylococcal, and pseudomonal species in liver abscesses.

- *Candida* fungal abscesses are also found in cancer patients that have undergone cytotoxic chemotherapy.
- *Mycobacterium tuberculosis* is a common infecting organism in the acquired immune deficiency syndrome

Signs and Symptoms Associated with Hepatic Abscess

- SYMPTOMS

- Fever 83%
- Weight loss 60%
- Pain 55%
- Nausea and vomiting 50%
- Malaise 50%
- Chills 37%
- Anorexia 34%
- Cough or pleurisy 30%
- Pruritus 17%
- Diarrhea 12%

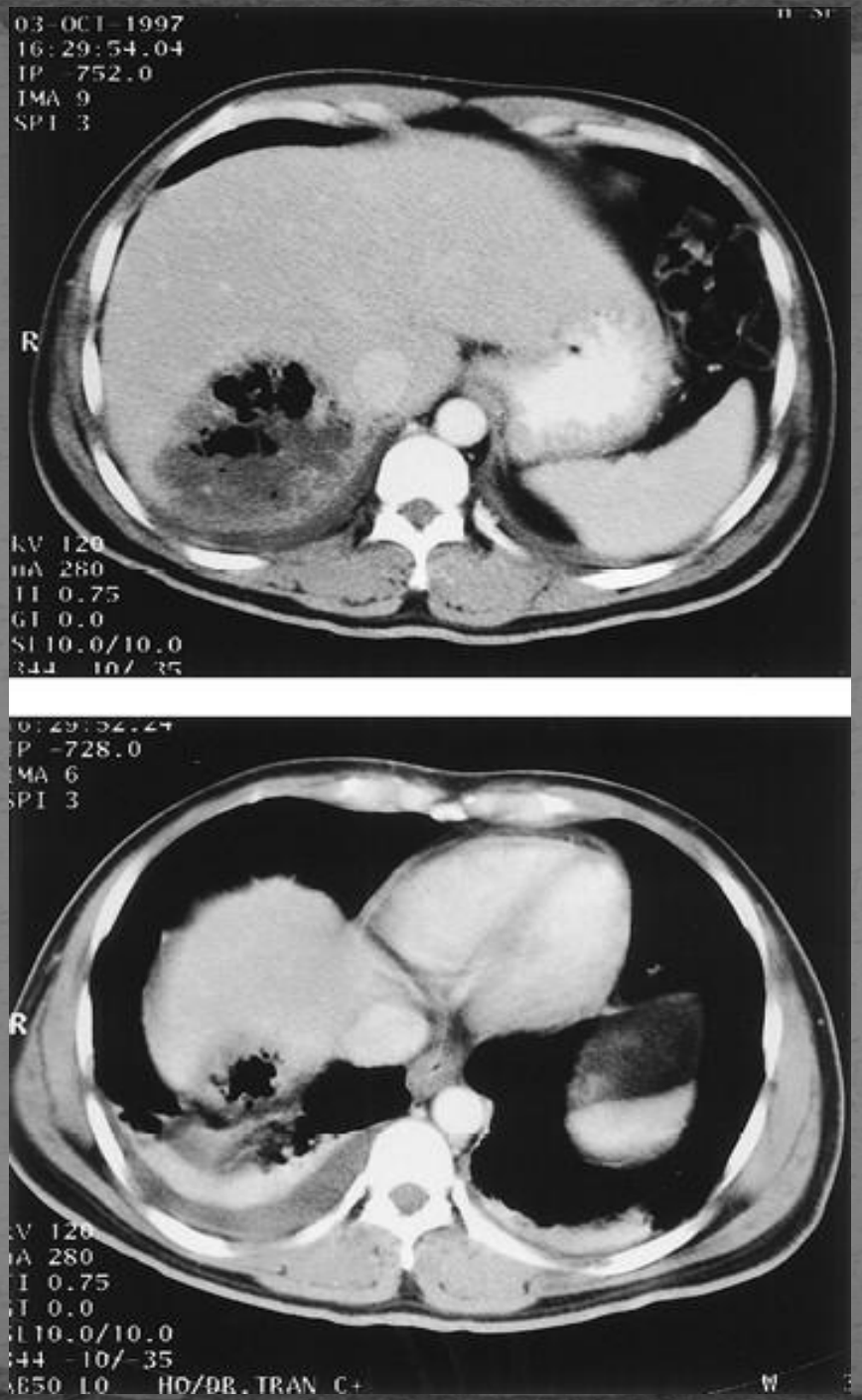
- SIGNS

- Right upper quadrant tenderness 52%
- Hepatomegaly 40%
- Jaundice 31%
- Right upper quadrant mass 25%
- Ascites 25 %
- Pleural effusion or rub 20%

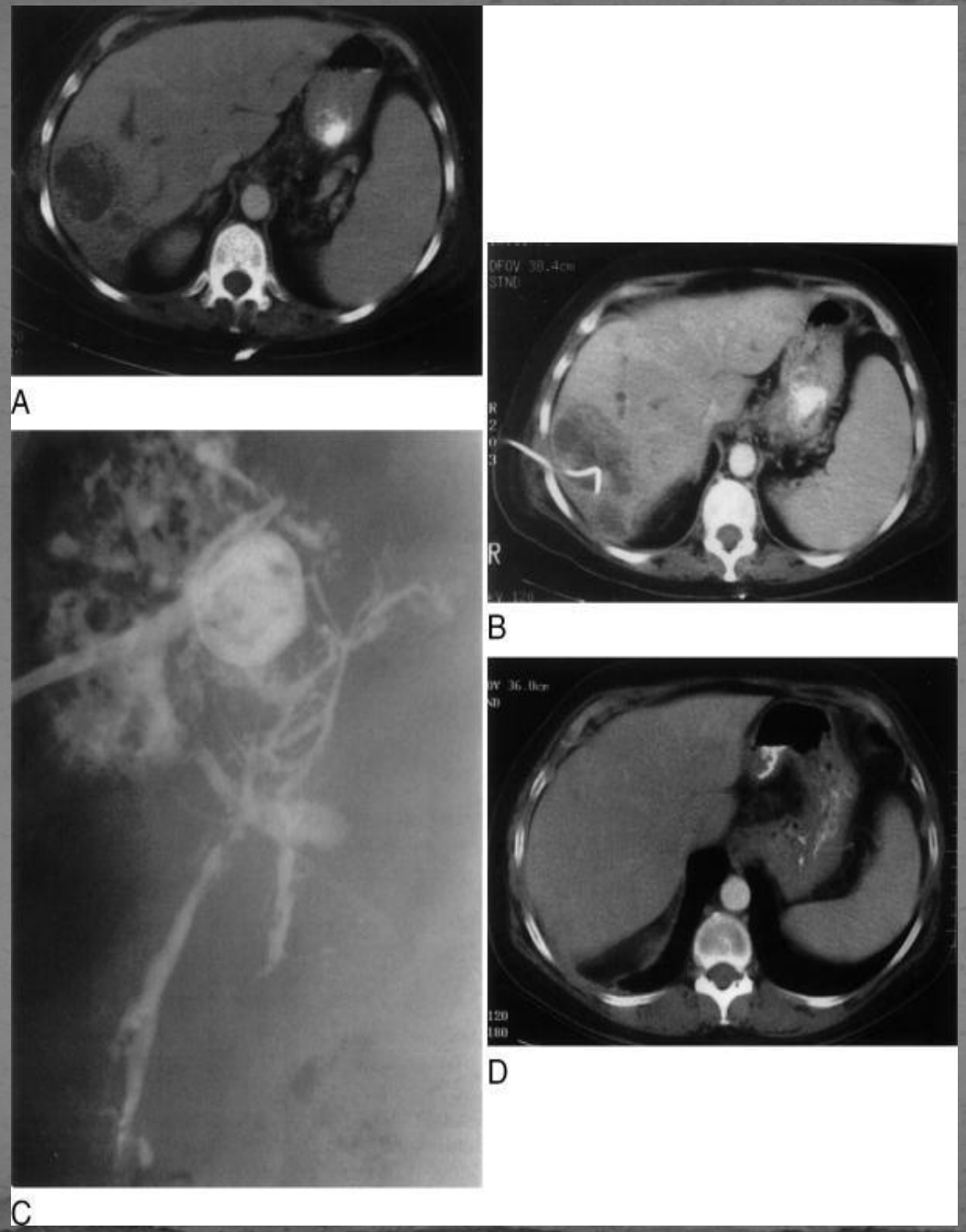
Radiology

- Plain films such as chest radiographs are abnormal in 50% of patients.
- Findings may include an
- elevated right hemidiaphragm,
- a right pleural effusion, and/or
- right lower lobe atelectasis.

- Abdominal films may show
- hepatomegaly,
- air-fluid levels in the presence of gas-forming organisms, or
- portal venous gas if pylephlebitis is the source
- Ultrasound will distinguish solid from cystic lesions and is cost effective and portable.
- Ultrasound (US) is 80–95% sensitive but has limited utility in the morbidly obese and in lesions that are located under the ribs or in an inhomogeneous liver.
- Computed tomography (CT) is more sensitive (95–100%) than US
- Lesions are detectable to around 0.5 cm with CT and are not limited by shadowing from ribs or air.



- Large hepatic abscess. Note presence air and gas within segments 7 and 8 of the right liver



- A, CT scan demonstrates multiloculated hepatic abscess in the right liver.
- B, CT scan at the time of percutaneous drainage.
- C, Contrast study through the drainage catheter demonstrating typical irregular loculated type appearance, as well as communication with biliary tree.
- D, Follow-up CT scan 3 months after treatment demonstrating complete resolution of abscess

LABORATORY DATA

- Increased alkaline phosphatase 87 %
- WBC count >10,000/mm^3 71 %
- Albumin <3 g/dL 55 %
- Hematocrit <36% 53 %
- Bilirubin >2 mg/dL 24%

Treatment

- treatment of the abscess itself, and
- concomitant treatment of the source.

- Steps in management include
  - antibiotic administration,
  - radiologic confirmation by US or CT, and
  - drainage.

- Exceptions to this strategy include
  - multiple small abscesses and
  - miliary fungal abscesses.

- These abscesses are treated with intravenous antibiotics and antifungals respectively, without a drainage procedure.

Antibiotics

- broad-spectrum intravenous antibiotics are administered until sensitivities allow a more selective antibiotic choice
- Classic antibiotic regimens include an
  - aminoglycoside,
  - clindamycin, and
  - either ampicillin or vancomycin.

- Fluoroquinolones can replace aminoglycosides, and
- metronidazole can be used instead of clindamycin, especially if an amebic source is suspected.

- Single-agent therapy with
  - ticarcillin-clavulanate,
  - imipenem-cilastatin or
  - piperacillin-tazobactam is also acceptable.

- Treatment used to be given for 4–6 weeks
- however, many studies now document success with only 2 weeks of antibiotic therapy.

- Five treatment modalities are available for pyogenic liver abscesses.
- They are indicated in different clinical scenarios; however, in general, they represent a sequential approach to treatment:
  - Parenteral broad-spectrum antibiotic therapy alone
  - Percutaneous needle aspiration and antibiotic therapy: Single or repeated
  - Percutaneous catheter drainage and antibiotic therapy
  - Laparoscopic drainage with antibiotic therapy
  - Laparotomy with intraoperative drainage and antibiotic therapy

Complications

- Up to 40% of patients develop complications from pyogenic liver abscesses, with the most common being generalized sepsis.
- pleural effusions,
- empyema, and
- pneumonia.
- Abscesses may also rupture intraperitoneally, which is frequently fatal.
- Usually, however, the abscess does not rupture, but develops a controlled leak resulting in a perihepatic abscess.
- Pyogenic abscesses also can cause hemobilia and hepatic vein thrombosis

Amebic Liver Abscess

- Amebic liver abscess is caused by the parasitic protozoan *Entamoeba histolytica*.

- Amebic liver abscess is ten times as common in men as in women and is a rare disease in children

- Two species of ameba infect humans.
- *E. dispar* is associated with an asymptomatic carrier state and not with disease.
- *E. histolytica* is responsible for all forms of invasive disease.

Pathology

- The life cycle involves cysts, invasive trophozoites, and fecally contaminated food or water to initiate the infection.
- Fecal-oral transmission occurs
- the cyst passes through the stomach into the intestine unscathed,
- And then pancreatic enzymes start to digest the outer cyst wall.
- The trophozoite is then released into the intestine and multiplies there.
- Normally, no invasion occurs, and the patient develops amebic dysentery alone or becomes an asymptomatic carrier.
- In a small number of cases, the trophozoite invades through the intestinal mucosa,
  - travels through the mesenteric lymphatics and veins, and
  - begins to accumulate in the hepatic parenchyma,
  - causing focal necrosis of hepatocytes and
  - multiple micro-abscesses that coalesce into a single abscess
- Liquefied hepatic parenchyma with blood and debris gives a characteristic "*anchovy paste*" appearance to the abscess.

Diagnosis

- The definitive diagnosis of amebic liver abscess is by
- *E. histolytica* trophozoites in the pus
- detection of serum antibodies to the ameba.

- The differential diagnosis should include
  - pyogenic liver abscess,
  - necrotic adenoma,
  - echinococcal cyst.

- SYMPTOMS

- Pain 90 %
- Fever 87 %
- Nausea and vomiting 85 %

- Anorexia 50 %
- Weight loss 45 %
- Malaise 25 %
- Diarrhea 25 %
- Cough or pleurisy 25 %
- Pruritus < 1 %

- SIGNS

- Hepatomegaly 85%
- Right upper quadrant tenderness 84 %
- Pleural effusion or rub 40%
- Right upper quadrant mass 12 %
- Ascites 10 %
- Jaundice 5%

- LABORATORY DATA

- Increased alkaline phosphatase 80 %
- WBC count > 10,000/mm^3 70 %
- Hematocrit < 36% 49 %
- Albumin < 3 g/dL 44 %
- Bilirubin > 2 mg/dL 10 %

Distinguishing Clinical Characteristics of Patients with Hepatic Abscesses

- Amebic

- Age < 50 years
- Male:female ratio 10 : 1
- Hispanic descent
- Recent travel to endemic area
- Pulmonary dysfunction
- Abdominal pain
- Diarrhea
- Abdominal tenderness
- Hepatomegaly

- Pyogenic

- Age >50 years
- Male:female ratio 1 : 1
- No ethnic predisposition
- Malignancy
- High fevers
- Pruritus
- Jaundice
- Septic shock
- Palpable mass

Radiology

- Chest radiographs are abnormal in two-thirds of patients with amebic liver abscess pleural effusion, infiltrates,
- elevated hemidiaphragm.

- Ultrasound, CT, and magnetic resonance imaging (MRI) are all excellent methods of detecting amebic liver abscesses but are nonspecific
- In 75–80% of cases, only a single abscess is present and in the right lobe,
- 10% are in the left lobe,
- and the rest are multiple
- The mean resolution time is 7 months, and
- 70% have findings that persist for more than 6 months.
- Eventually, resolution may be complete or result in a small residual cystic cavity that resembles a simple cyst of the liver

Serology And Diagnostic Aspiration

- Serum antibodies are positive in 85% of patients with invasive colitis, and 99% of patients with liver abscesses
- Diagnostic aspirations are usually done
- when amebic serologies are negative and
- a pyogenic cause needs to be ruled out.
- The fluid of an amebic abscess is odorless, and
- Gram's stain and cultures are negative.
- Amebae are recovered in 33–90% of aspirates, and
- wall scrapings increase the yield.
- Aspiration should not be done if an echinococcal cyst or a cancer is suspected.
- The former may result in anaphylactic shock, and the latter has the potential to seed the tract with malignant cells

Treatment

- Since the introduction of metronidazole in the 1960s, surgical drainage of amebic liver abscesse has become virtually unnecessary.
- Drainage procedures, regardless of the approach, are reserved for those cases in whom the diagnosis is questionable or when complications occur

- Metronidazole, is the mainstay of treatment for invasive amebiasis.
- Nitroimidazoles with longer half-lives (secnidazole, tinidazole, and ornidazole) are better tolerated and can be given for shorter periods of time,
- Metronidazole reaches high concentrations in the liver, stomach, intestine, and kidney
- Positive responses to metronidazole should be seen by the third day of treatment.
- At 5 days, an 85% cure rate is achieved,
- 95% by 10 days.

Drainage

- Percutaneous
  - Image-guided percutaneous treatment (aspiration or catheter drainage) has replaced surgical intervention as the procedure of choice for decreasing the size of an abscess.
  - The high viscosity of amebic abscess fluid, however, requires a large diameter catheter adequate drainage, and this may cause more discomfort for the patient.
  - Secondary infections related to the indwelling catheter are always a risk of this interven

- Surgical
  - Surgical drainage of amebic liver abscesses has largely been replaced by antibiotic therapy.
  - The most common indication for surgical intervention is to manage abscesses that have failed to respond to more conservative therapy.
- Laparotomy is indicated for
  - life-threatening hemorrhage that may or may not be related to abscess rupture
  - amebic abscess erodes into a neighboring viscus and control of the involved viscus is necessary.
  - Sepsis due to a secondarily infected amebic abscess also warrants operative intervention if percutaneous treatment fails.

Thank you