

Genus : Echinococcus

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Echinococcus : morphology

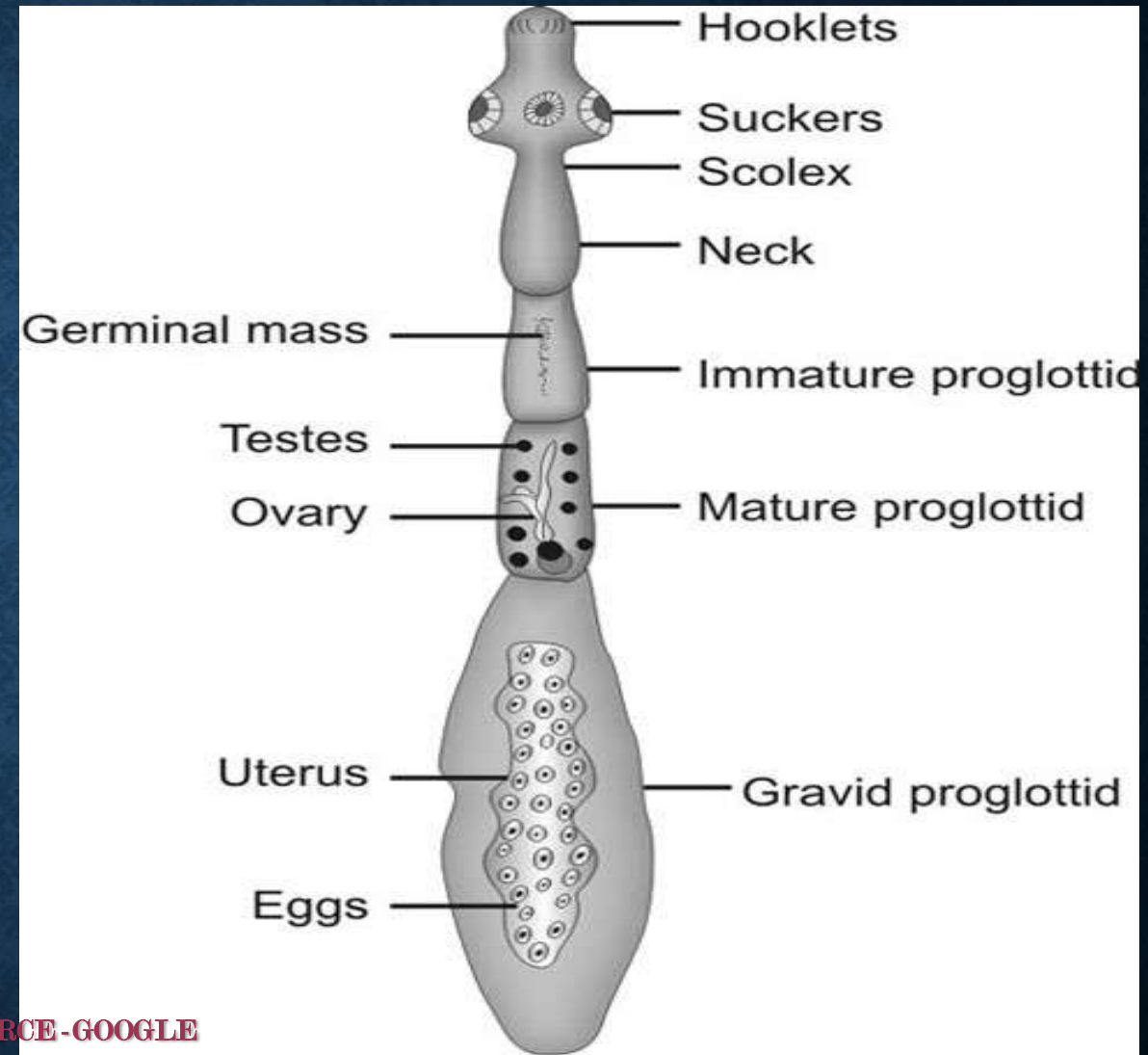
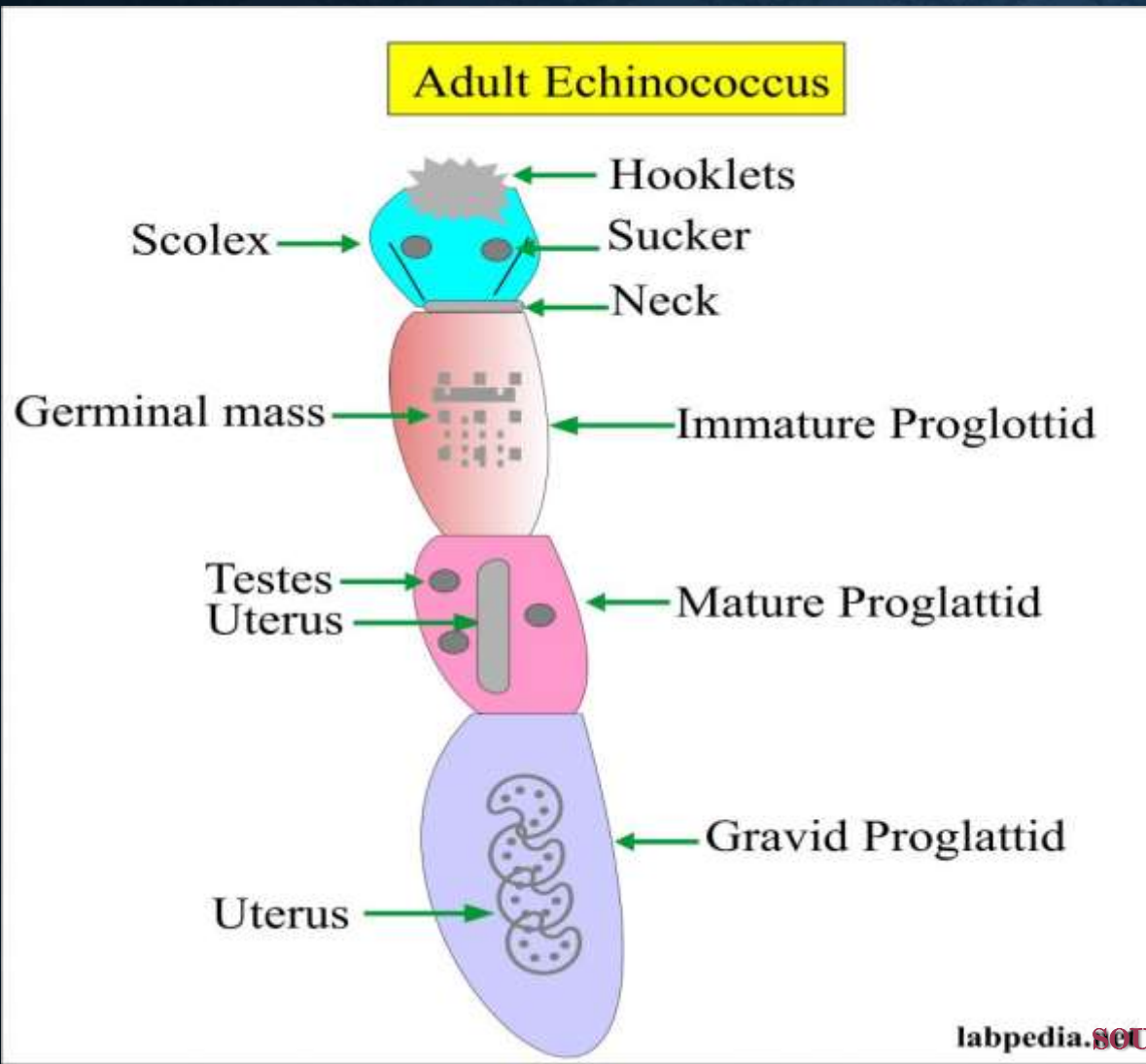
- ❑ Adult *E. granulosus* worms are small and have a scolex with only three attached segments.
- ❑ The scolex has four lateral suckers.
- ❑ The rostellum is non-retractable and armed with a double crown of 28-50 recurved hooks.
- ❑ The anterior segment is immature, the middle segment is mature with functional testes .
- ❑ The ovaries, and the posterior segment is gravid with the uterus filled with eggs.
- ❑ The eggs are typical ,small and rounded , thick-shelled and contain a hexacanth (6-hooked) embryo (oncosphere).
- ❑ The encysted larval i.e metacestode stage is known as a bladder-worm or hydatid.
- ❑ *E. granulosus* forms fluid-filled unilocular cysts with endogenous budding of brood capsules.

Parasite of the Hydatid Cyst

Echinococcus granulosus
adult



(By P.W. Pappas and S.M. Wardrop original by P. Darben)



Echinococcus : life cycle

Life cycle outside the body:

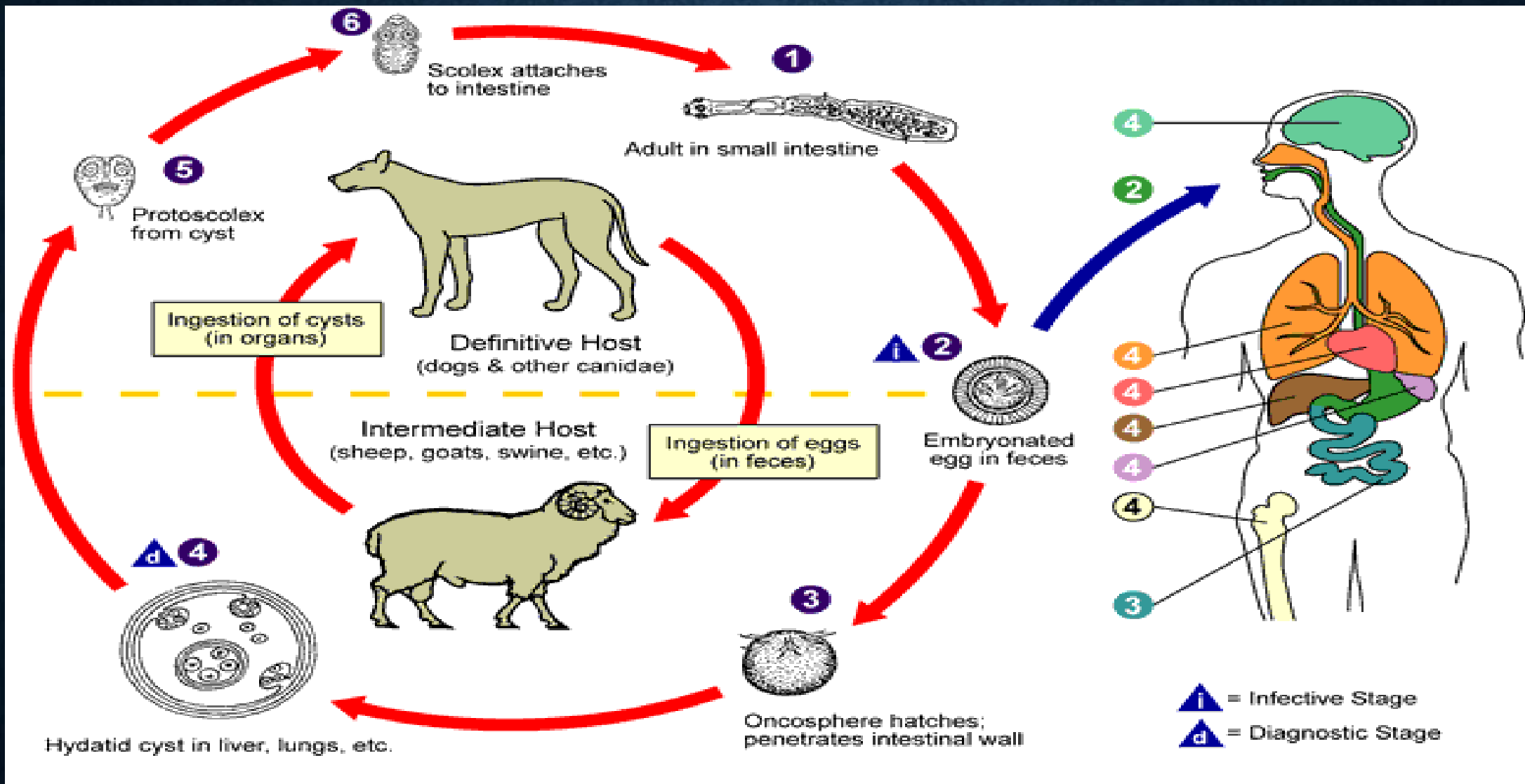
- ❑ The adult Echinococcus is about 3-6 mm, resides in the bowel of its definite host.
- ❑ Gravid proglottids release eggs that are passed in the feces.
- ❑ These eggs are then ingested by a suitable intermediate host, including sheep, goat, swine, cattle, horses and camels.
- ❑ The eggs then hatch in the bowels and release oncospheres that penetrate the intestinal wall. These oncospheres then migrate through the circulatory system to various organs of the host.
- ❑ At the organ site, the oncosphere develops into a hydatid cyst. This cyst enlarges gradually, producing protoscolices and daughter cysts that fill the cyst interior.

Life cycle conted....

- ❑ These cyst-containing organs are then ingested by the definite host, causing infection. After ingestion, the protoscolices evaginate, producing protoscolexes.
- ❑ The scolexes of the organisms attach to the intestine of the definite host and develop into adults in 32-80 days.

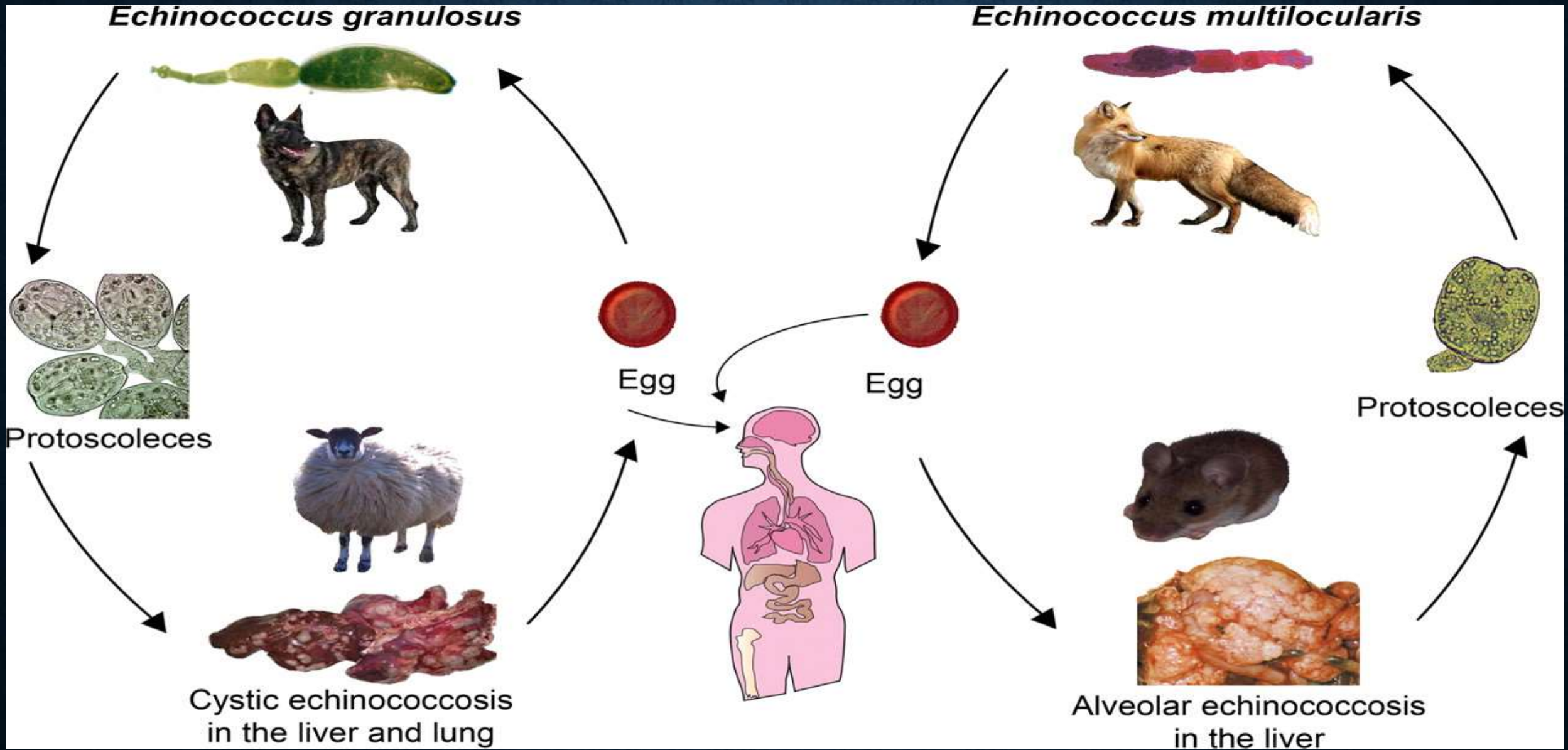
The life cycle then continues in humans:

- ❑ Humans can become infected if they ingest substances infected with Echinococcus eggs.
- ❑ The eggs then release oncospheres in the small intestine.
- ❑ At these places, oncospheres migrate through the circulatory system and produce hydatid cysts.



Echinococcus : mode of transmission

- ❑ The cysts develop into adult tapeworms in the dog.
- ❑ Infected dogs shed tapeworm eggs in their feces which contaminate the ground.
- ❑ *Echinococcus* eggs deposited in soil can stay viable for up to a year.
- ❑ Sheep, cattle, goats, and pigs ingest tapeworm eggs in the contaminated ground.
- ❑ After hatching the eggs develop into cysts in the internal organs.
- ❑ The most common mode of transmission to humans is by the accidental consumption of soil, water, or food that has been contaminated by the fecal matter of an infected dog.
- ❑ The disease is most commonly in people involved in raising sheep.



Echinococcus : pathogenesis

- ❑ Mainly infections are acquired during childhood
- ❑ Clinical signs and pathogenesis of echinococcosis may not appear for years, except when cysts are in vital organs.
- ❑ Liver cysts may eventually cause abdominal pain or a palpable mass.
- ❑ Jaundice may occur if the bile duct is obstructed.
- ❑ Rupture into the bile duct, peritoneal cavity, or lung may cause fever, urticaria, or a serious anaphylactic reaction.
- ❑ Pulmonary cysts can rupture, causing cough, chest pain, and hemoptysis.



Source - google



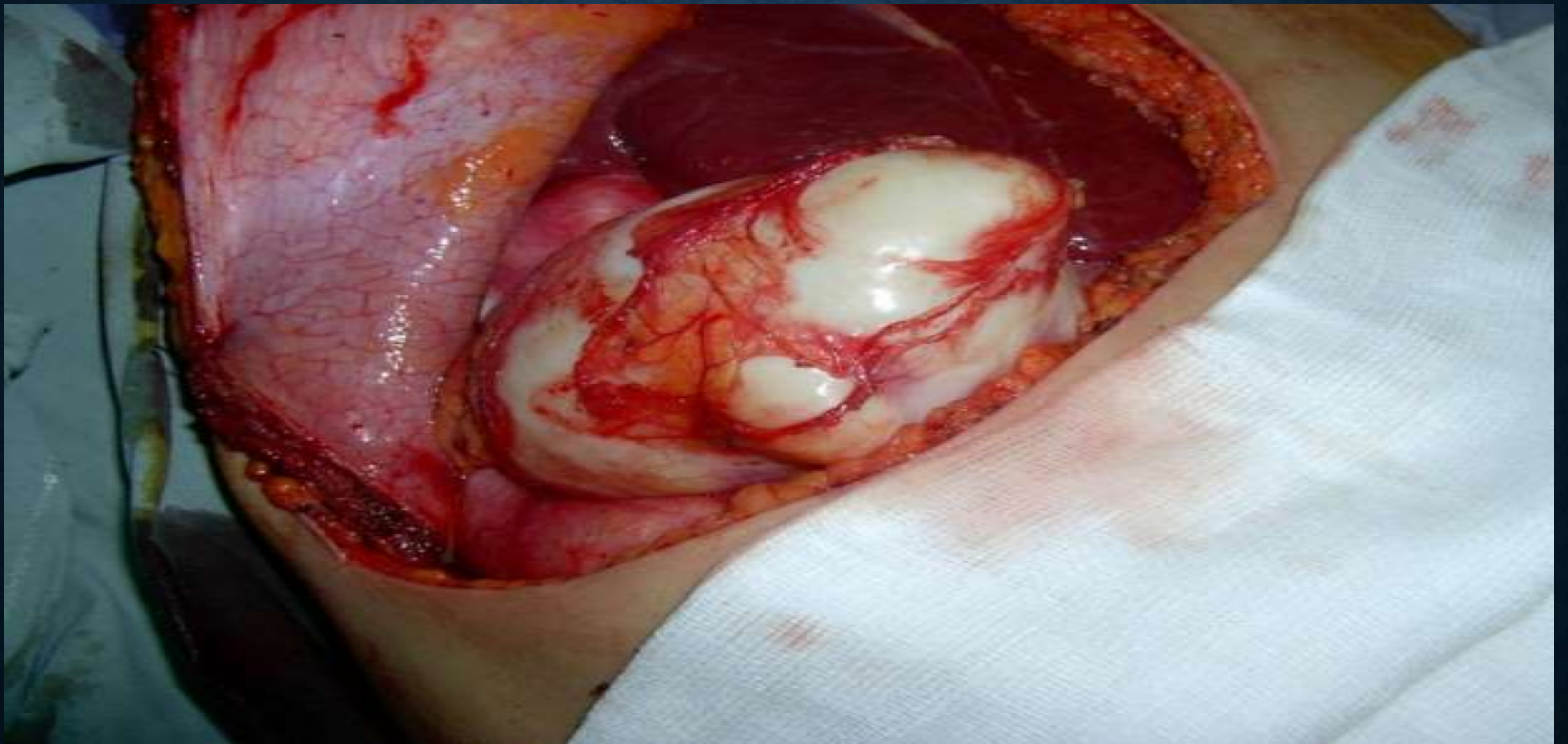
Hydatid cyst of liver

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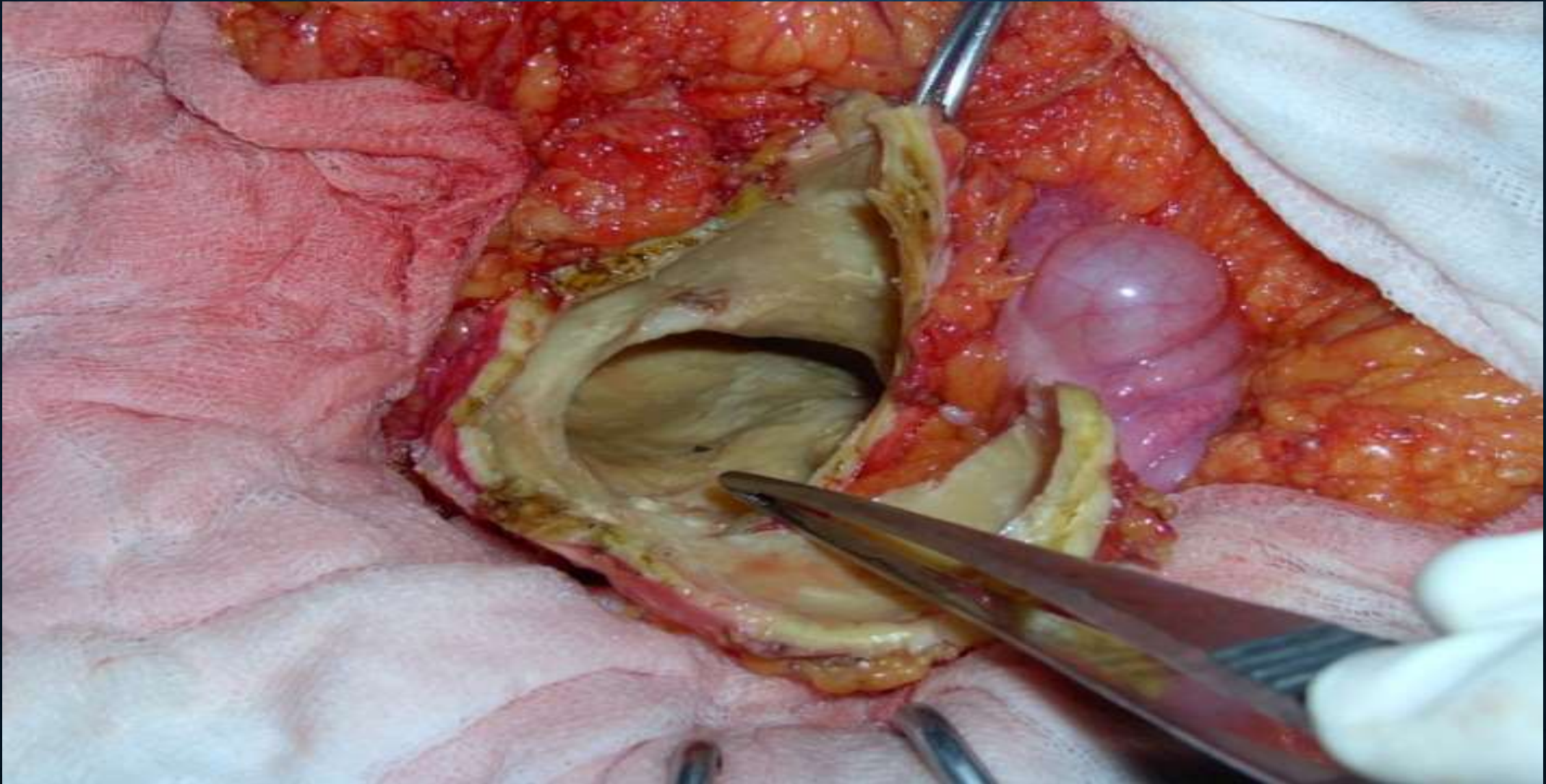
Hydatid cyst of the liver with spontaneous rupture in peritoneum



Source - google

Hydatid cyst of the peritoneum

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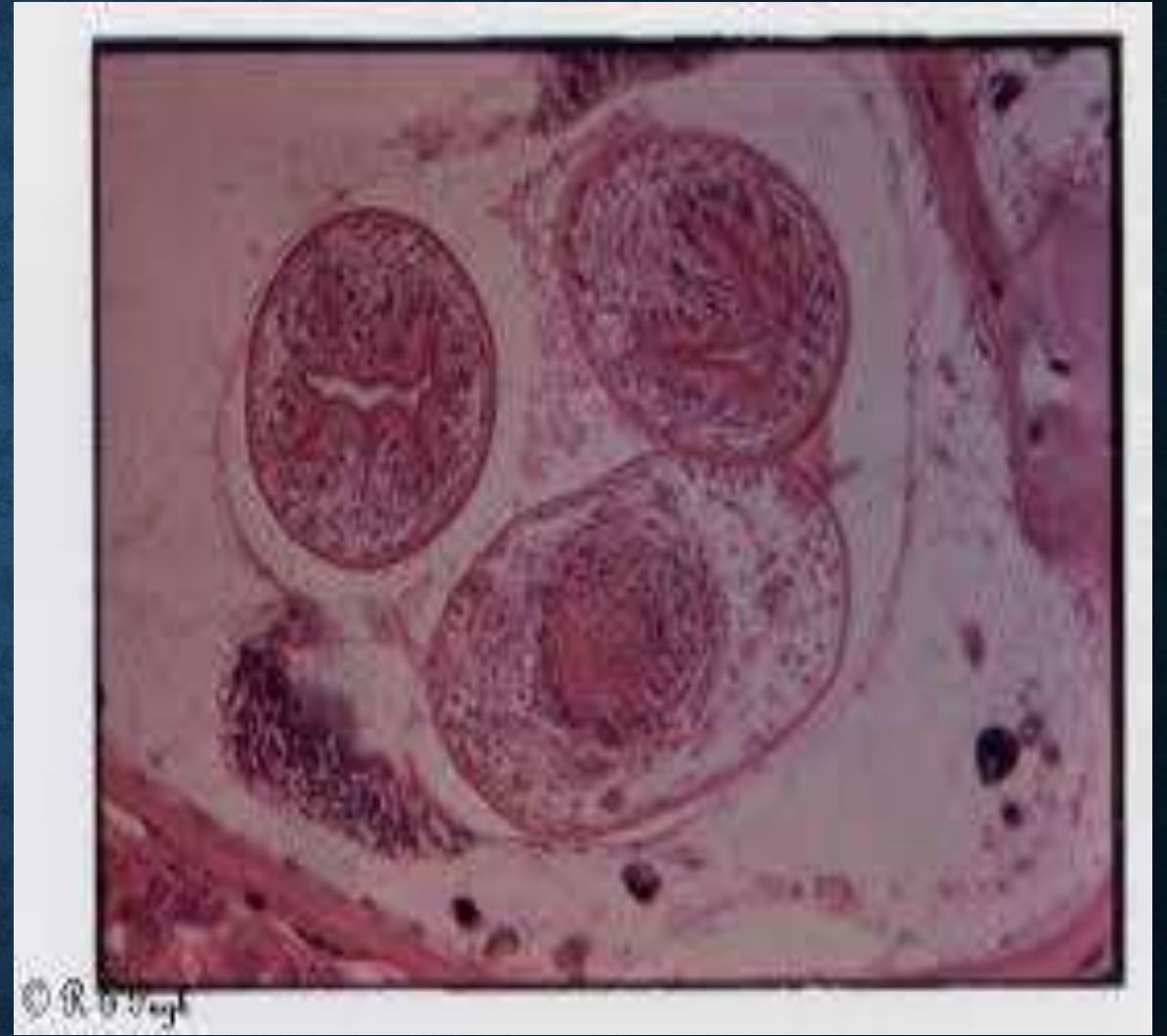
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Peritoneal Echinococcosis

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Echinococcus : Diagnosis

- ❑ Early detection of *E. granulosus* and *E. multilocularis* infections is based on clinical signs and symptoms.
- ❑ Ultrasonography imaging is another technique for the diagnosis of both cystic and alveolar echinococcosis in human beings. This technique is usually validated by computed tomography (CT) and/or magnetic resonance imaging (MRI) scans.
- ❑ Cysts can be also diagnosed by radiography and different serological tests .



Source - google

Echinococcus : eggs

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Echinococcus : management

- ❑ Chemotherapy.
- ❑ Cyst puncture.
- ❑ PAIR (percutaneous aspiration, injection of chemicals and reaspiration) have been used to replace surgery as effective treatments for cystic echinococcosis.
- ❑ The treatment of alveolar echinococcosis is more difficult than cystic echinococcosis.