

Cestoda

Tenia solium *T. saginata* (Teniasis)

Epidemiology

These cestodes have a worldwide distribution but incidence is higher in developing countries.

Morphology

T. saginata can be up to 4 to 6 meters long and 12 mm broad

It has a scolex with four suckers without hooks

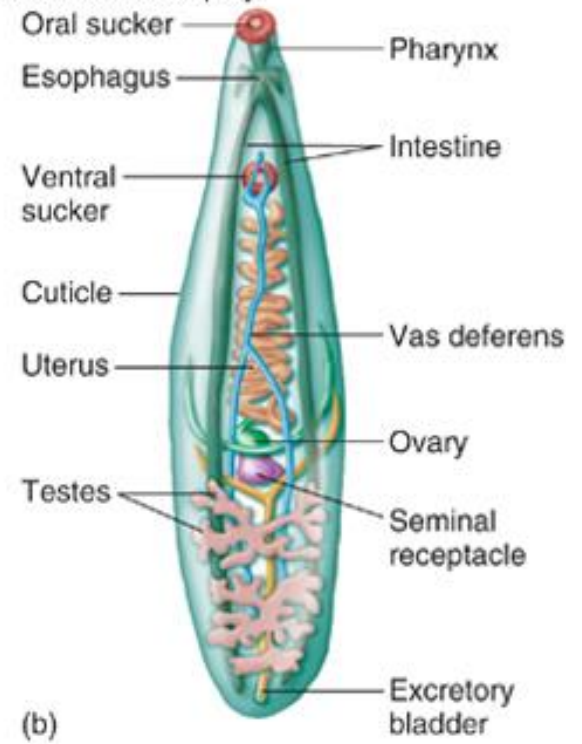
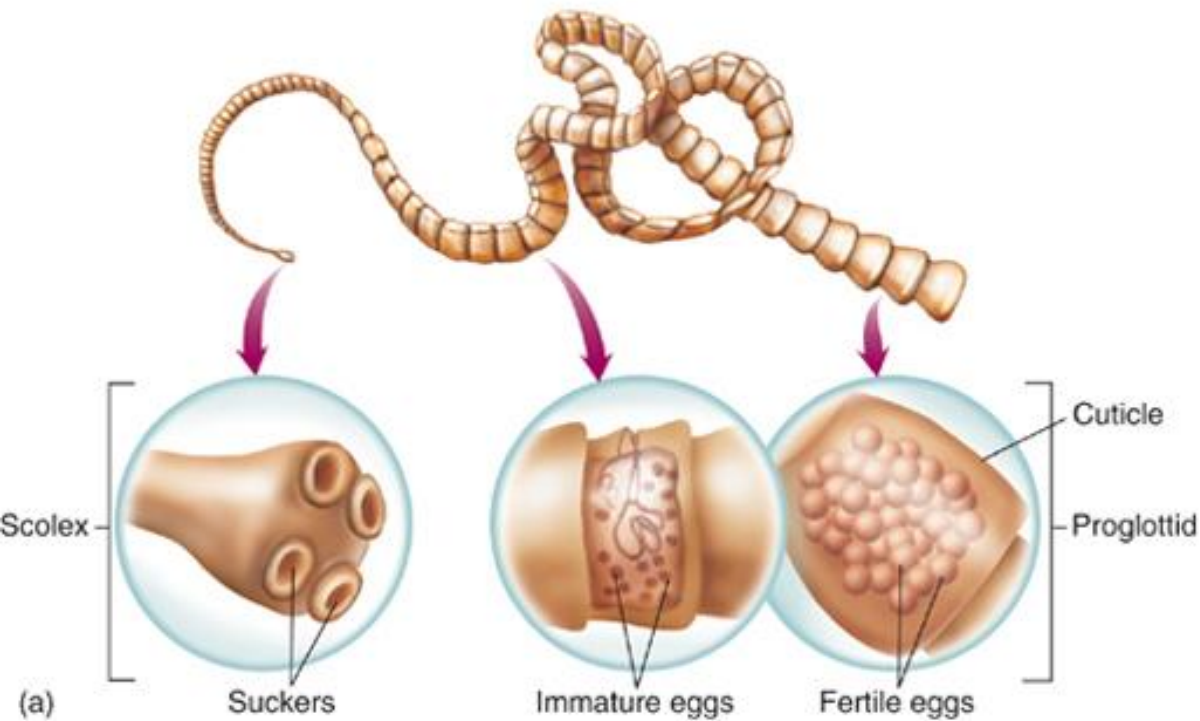
It has several hundred segments (proglottids). Each segment is about 18 x 6 mm with a branched uterus (15-30 branches).

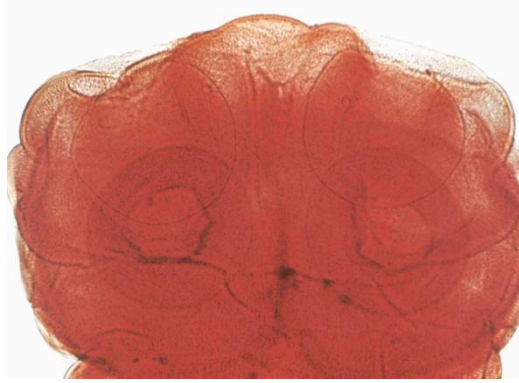
The egg is 35 x 45 micrometers, roundish and yellow-brown. It contains an embryo with 3 pairs of hooklets.

Life cycle

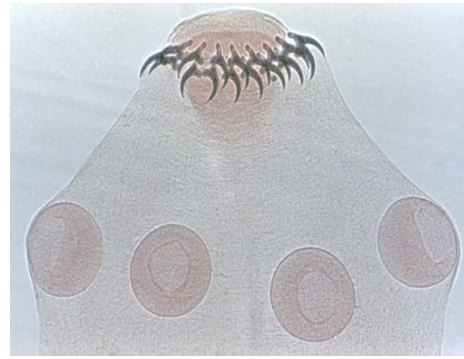
A tapeworm larval cyst (cysticercus) is ingested with poorly cooked infected meat; the larva escapes the cyst and passes to the small intestine where it attaches to the mucosa by the scolex suckers. The proglottids develop as the worm matures in 3 to 4 months. The adult may live in the small intestine as long as 25 years and pass gravid proglottids with the feces. Eggs extruded from the proglottid contaminate and persist on vegetation for several days and are consumed by cattle or pigs in which they hatch and form cysticerci (Figure 1).

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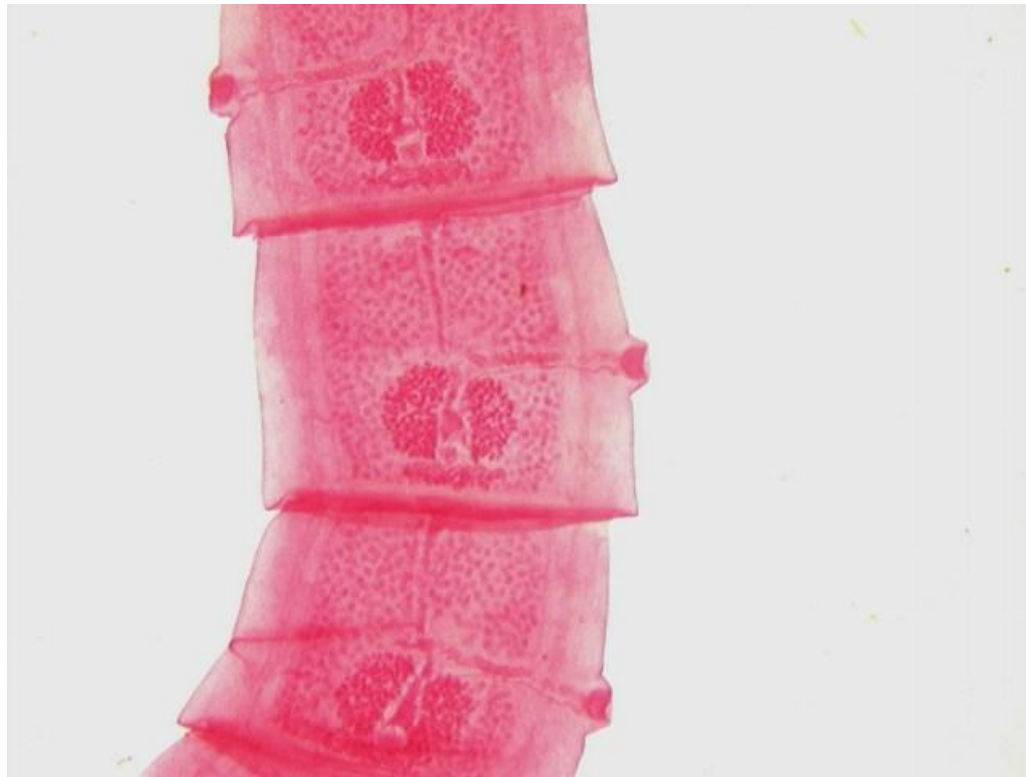


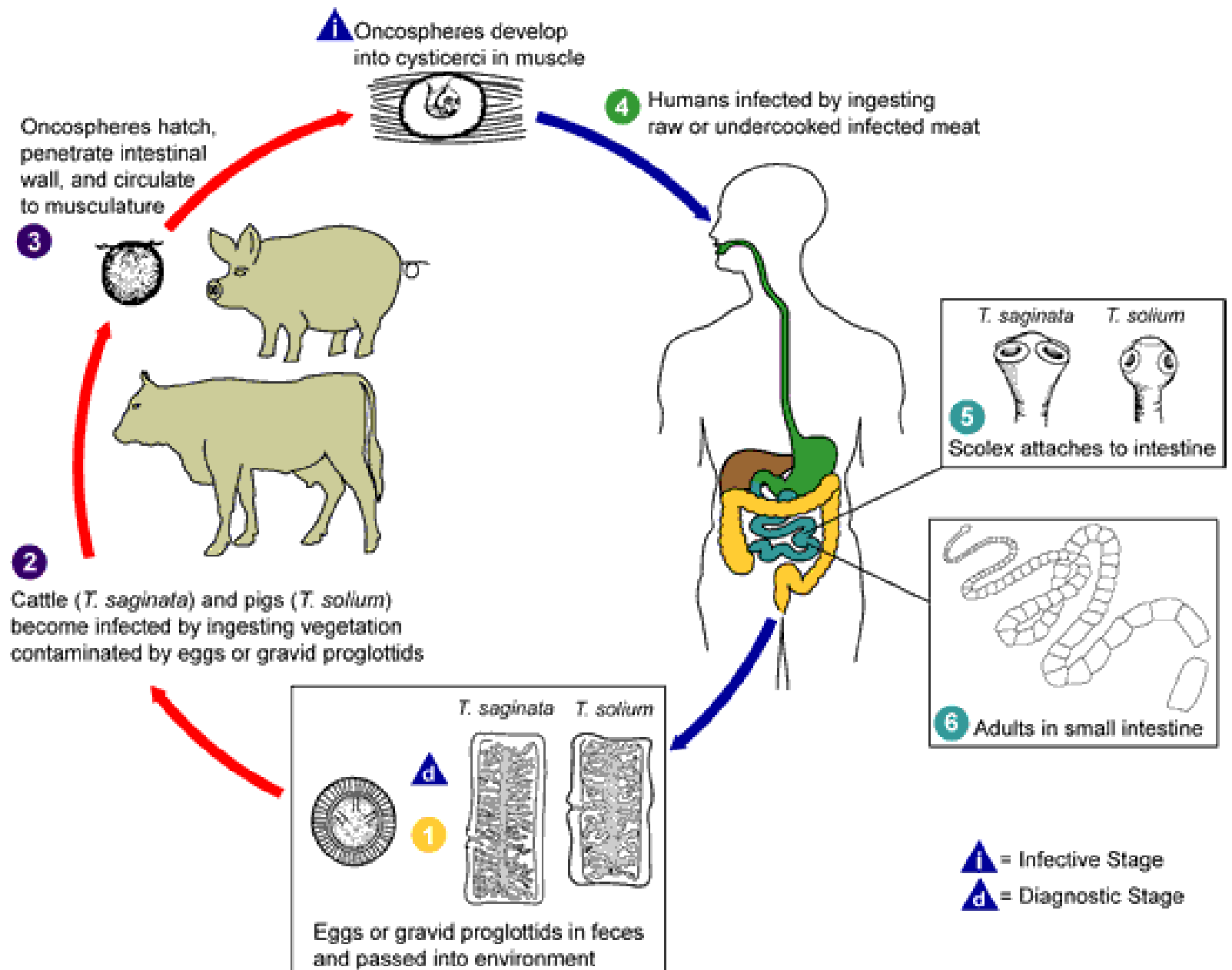


Taenia saginata



T. solium





Symptoms

Light infections remain asymptomatic, but heavier infections may produce abdominal discomfort, epigastric pain, vomiting and diarrhea.

Cysticercosis

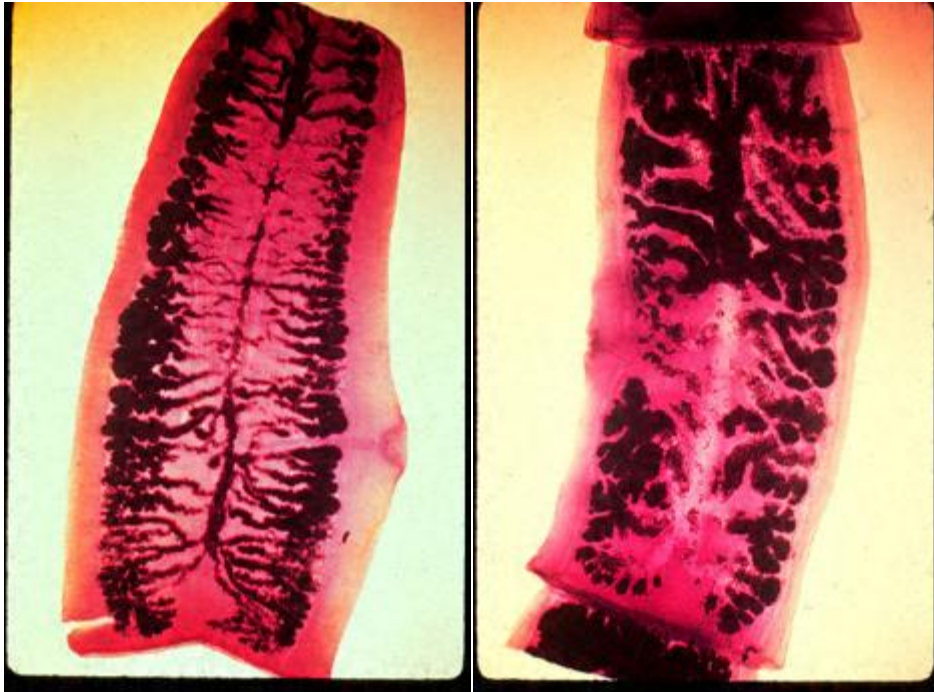
T. solium eggs can also infect humans and cause cysticercosis (larval cysts in lung, liver, eye and brain) resulting in blindness and neurological disorders.

Diagnosis

Diagnosis is based on the recovery of eggs or proglottids in stool or from the perianal area. Cysticercosis is confirmed by the presence of antibodies.

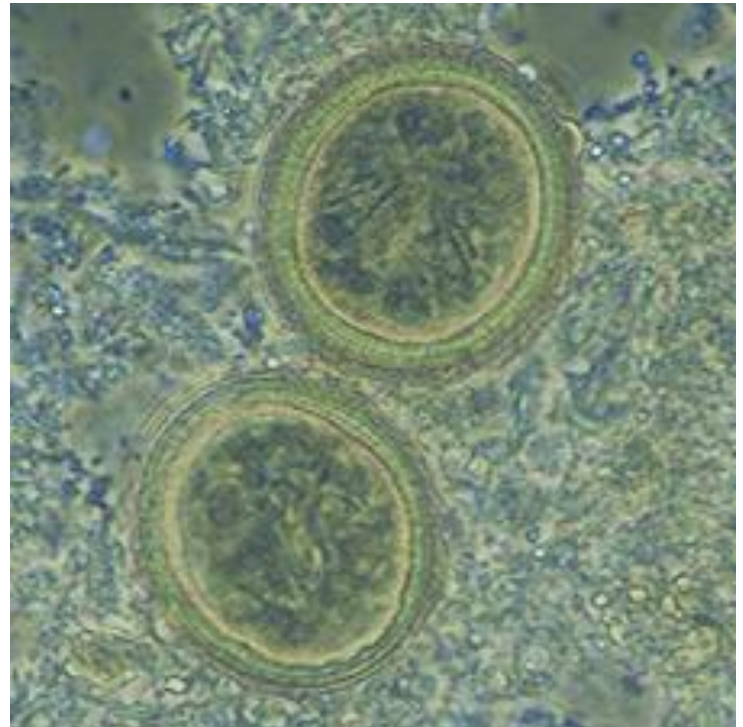
Treatment and control

Praziquantel and nicloseamide (Yomesan)



Tsag

Tsol



Echinococcosis (hydatidosis)

Echinococcus granulosus and *E. multilocularis* are causative agents of hydatid cysts.

Echinococcus granulosus

Epidemiology

The organism is common in Asia, Australia, Eastern Africa, southern Spain, southern parts of South America and northern parts of North America.

Morphology

This is the smallest of all tapeworms (3 to 9 mm long) with only 3 proglottids.

Echinococcus granulosus

Adult

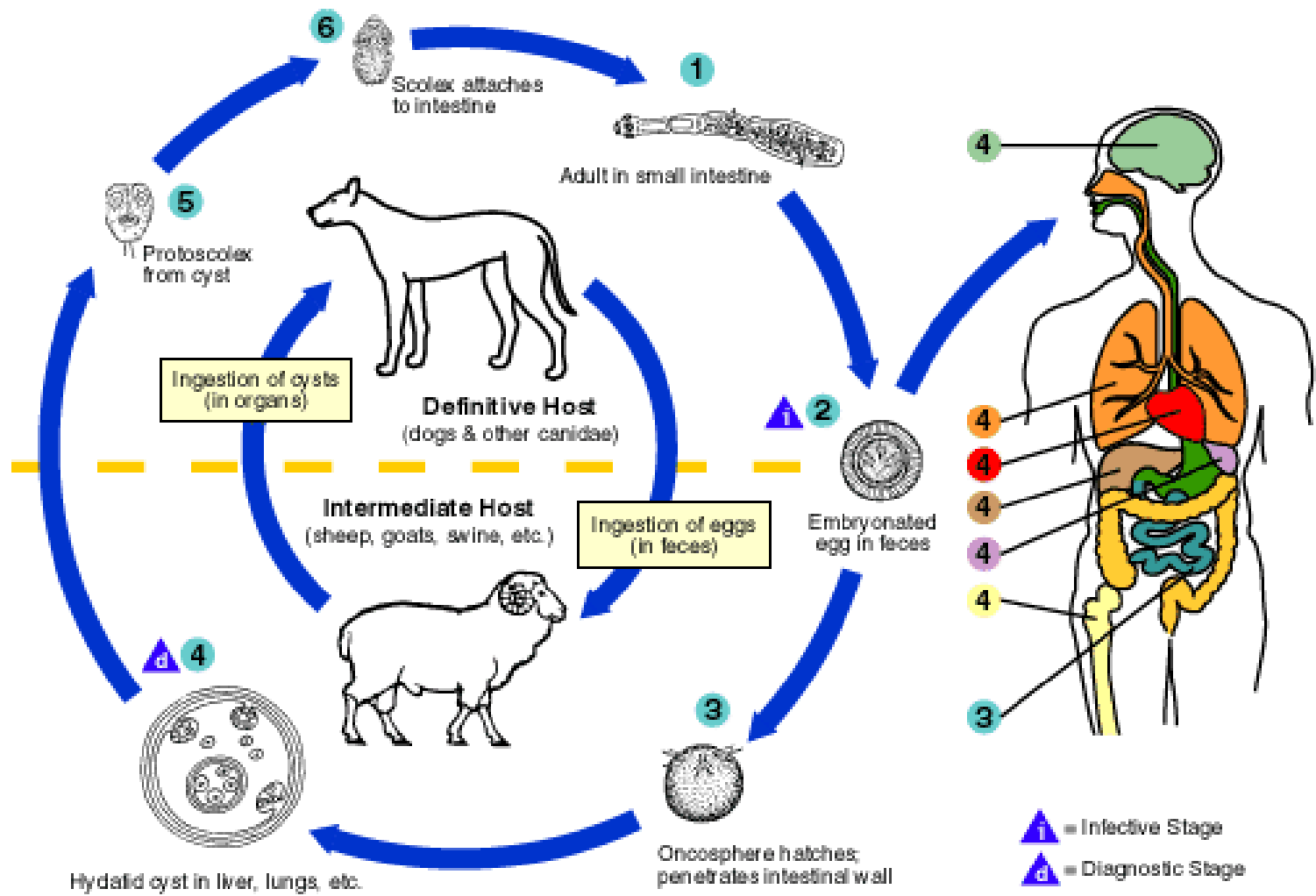


2mm

Peter Darben

Life cycle

The adult worm lives in domestic and wild carnivorous animals. Eggs, passed by infected animals, are ingested by the grazing farm animals or man, localize in different organs and develop into hydatid cysts containing many larvae (proto-scolices or hydatid sand) (Figure 8). When other animals consume infected organs of these animals, proto-scolices escape the cyst, enter the small intestine and develop into adult worms (Figure 7). Echinococcus eggs, when swallowed by man, produce embryos that penetrate the small intestine, enter the circulation and form cysts in liver, lung, bones, and sometimes, brain. The cyst is round and measures 1 to 7 cm in diameter, although it may grow to be 30 cm. The cyst consists of an outer anuclear hyaline cuticula and an inner nucleated germinal layer containing clear yellow fluid. Daughter cysts attach to the germinal layer, although some cysts, known as brood cysts, may have only larvae (hydatid sand). Man is a dead end host.



Symptoms

The symptom depend upon the location of the cyst.

Large abdominal cysts produce increasing discomfort.

Liver cysts cause obstructive jaundice.

Brain cysts produce intracranial pressure and epilepsy.

Diagnosis

Clinical symptoms of a slow-growing tumor accompanied by eosinophilia are suggestive.

Intradermal (Casoni) test with hydatid fluid is useful.

Pulmonary cysts and calcified cysts can be visualized using x-rays.

Antibodies against hydatid fluid antigens have been detected in a sizable population of infected individuals by ELISA or indirect hemagglutination test.

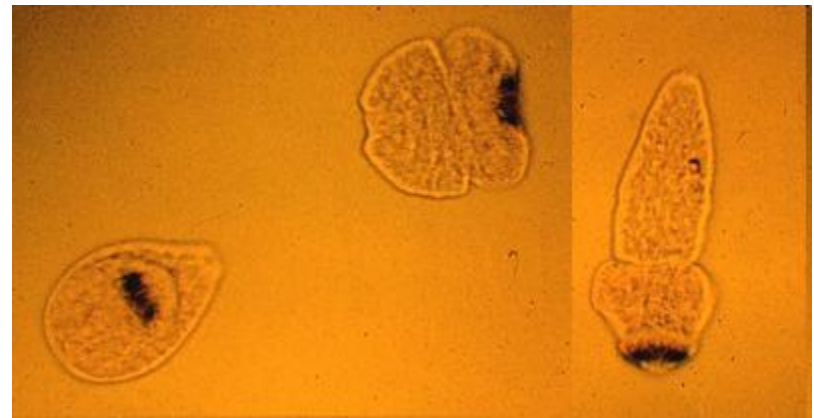
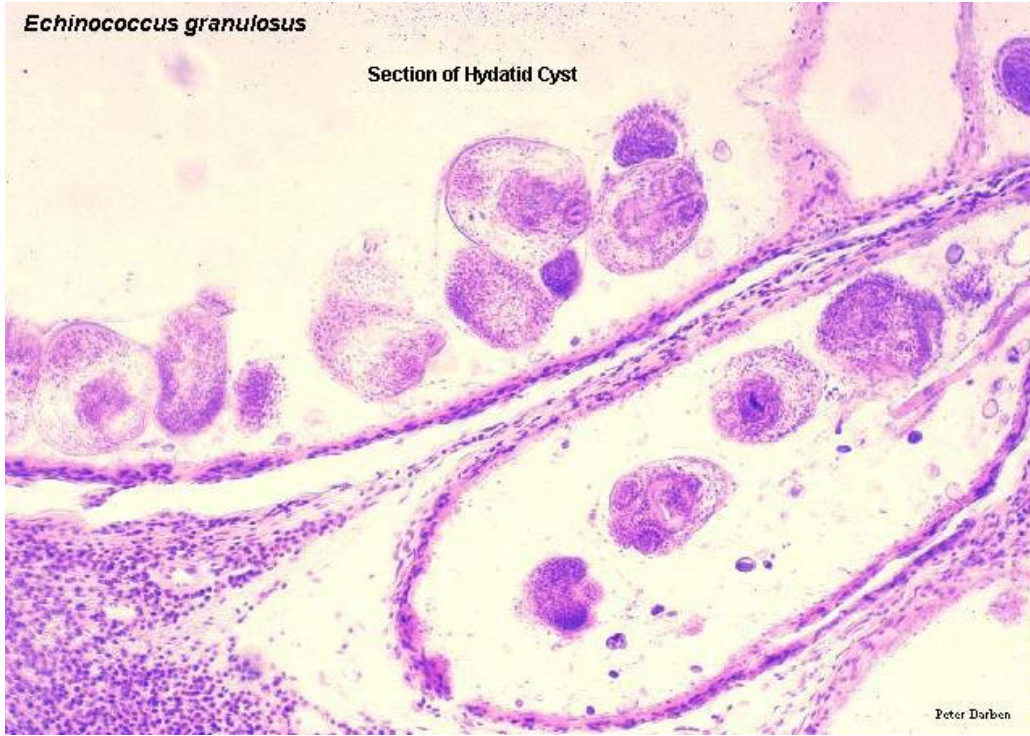
Treatment and control

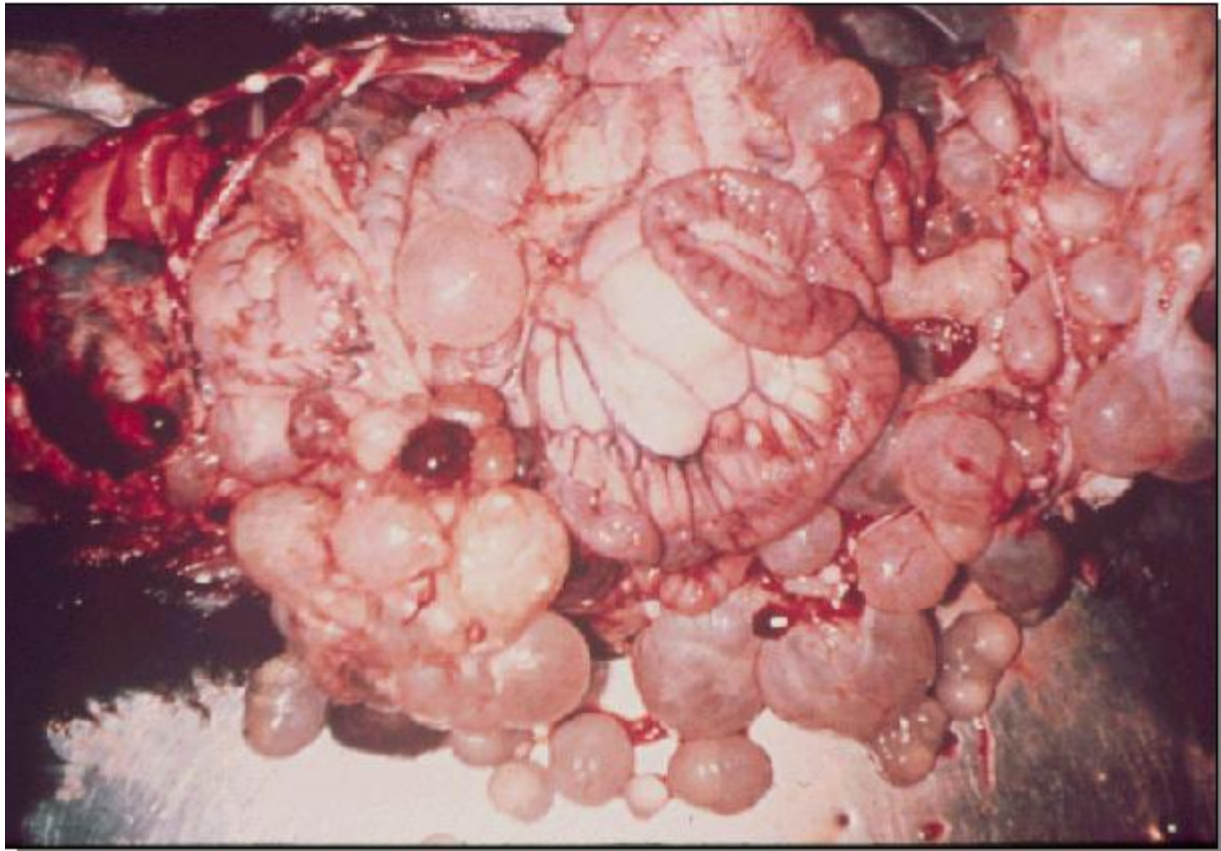
Treatment involves surgical removal of cyst or inactivation of hydatid sand by injecting the cyst with 10% formalin and its removal within few (4-5) minutes. Praziquantel and Albendazole.

Preventive measures involve avoiding contact with infected dogs and cats and elimination of their infection.

Echinococcus granulosus

Section of Hydatid Cyst









Positive skin test