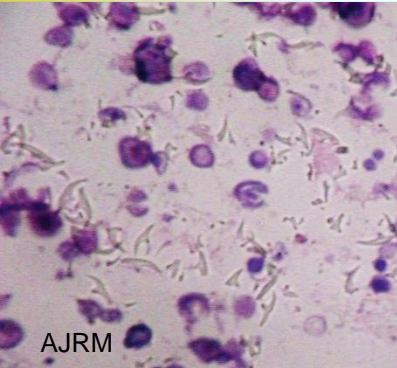
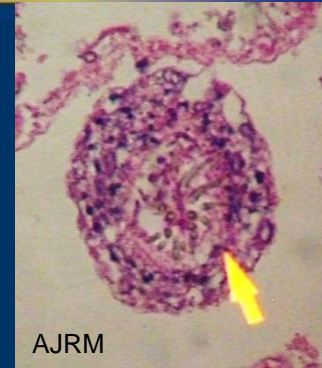




Universidad
Tecnológica
de Pereira



Cestodes: Equinococosis/Hidatidosis



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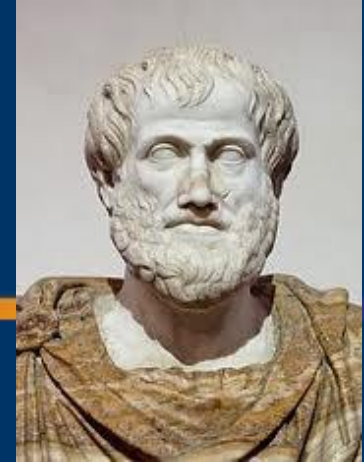
Consejo Consultivo, **Revista Peruana de Medicina Experimental y Salud Pública (RPMESP)**.

Editor Asistente, **Revista Médica de Risaralda (RMR)**.

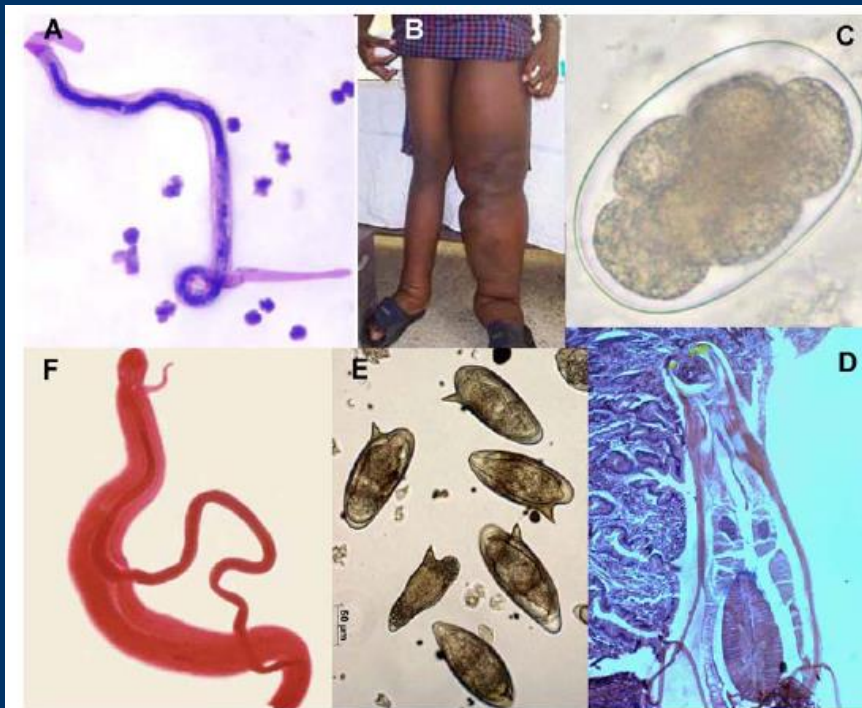
E-mail: arodriguezm@utp.edu.co

Cestodes

Introducción



- ¿Qué son los helmintos? **ΕΛΜΙΝΘΕΣ**



Brindley PJ, Mitreva M, Ghedin E, Lustigman S (2009) Helminth Genomics: The Implications for Human Health. PLoS Negl Trop Dis 3(10): e538.

doi:10.1371/journal.pntd.0000538

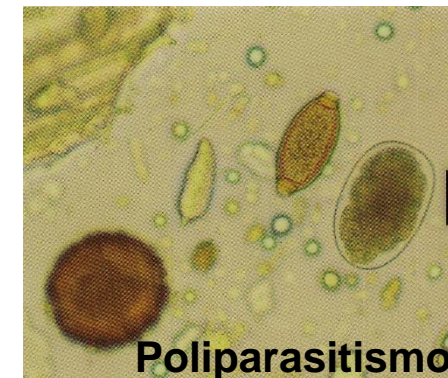


Figure 1. Montage of some of the major human helminth parasites, their developmental stages, and disease pathology. (A) Microfilaria of *Brugia malayi* in a thick blood smear, stained with Giemsa (http://www.dpd.cdc.gov/dpdx/html/frames/a-f/filariasis/body_Filariasis_mic1.htm); the microfilaria is about 250 μm in length. (B) Patient with lymphedema of the left leg due to lymphatic filariasis (<http://www.cdc.gov/ncidod/dpd/parasites/lymphaticfilariasis/index.htm>). (C) Hookworm egg passed in the stool of an infected person; the microscopic egg, barrel-shaped with a thin wall, is about 70 \times 40 μm in dimension. (D) longitudinal section through an adult hookworm attached to wall of small intestine, ingesting host blood and mucosal wall. The parasite is about 1 cm in length. (E) Eggs of *Schistosoma mansoni*. The egg is about 150 \times 50 μm in dimension; the lateral spine is diagnostic for *S. mansoni* in comparison to the other human schistosome species. Fibrotic responses to schistosome eggs trapped in the intestines, liver, and other organs of the infected person are the cause of the schistosomiasis pathology and morbidity. (F) A pair of adult worms of the blood fluke *Schistosoma mansoni*; the more slender female worm resides in the gynecophoral canal of the thicker male. The worms are about 1.5 cm in length, and live for many years (http://www.dpd.cdc.gov/dpdx/HTML/ImageLibrary/Schistosomiasis_il.htm). doi:10.1371/journal.pntd.0000538.g001

Phylum

Nematoda
(roundworms)

Platyhelminthes
(flatworms)

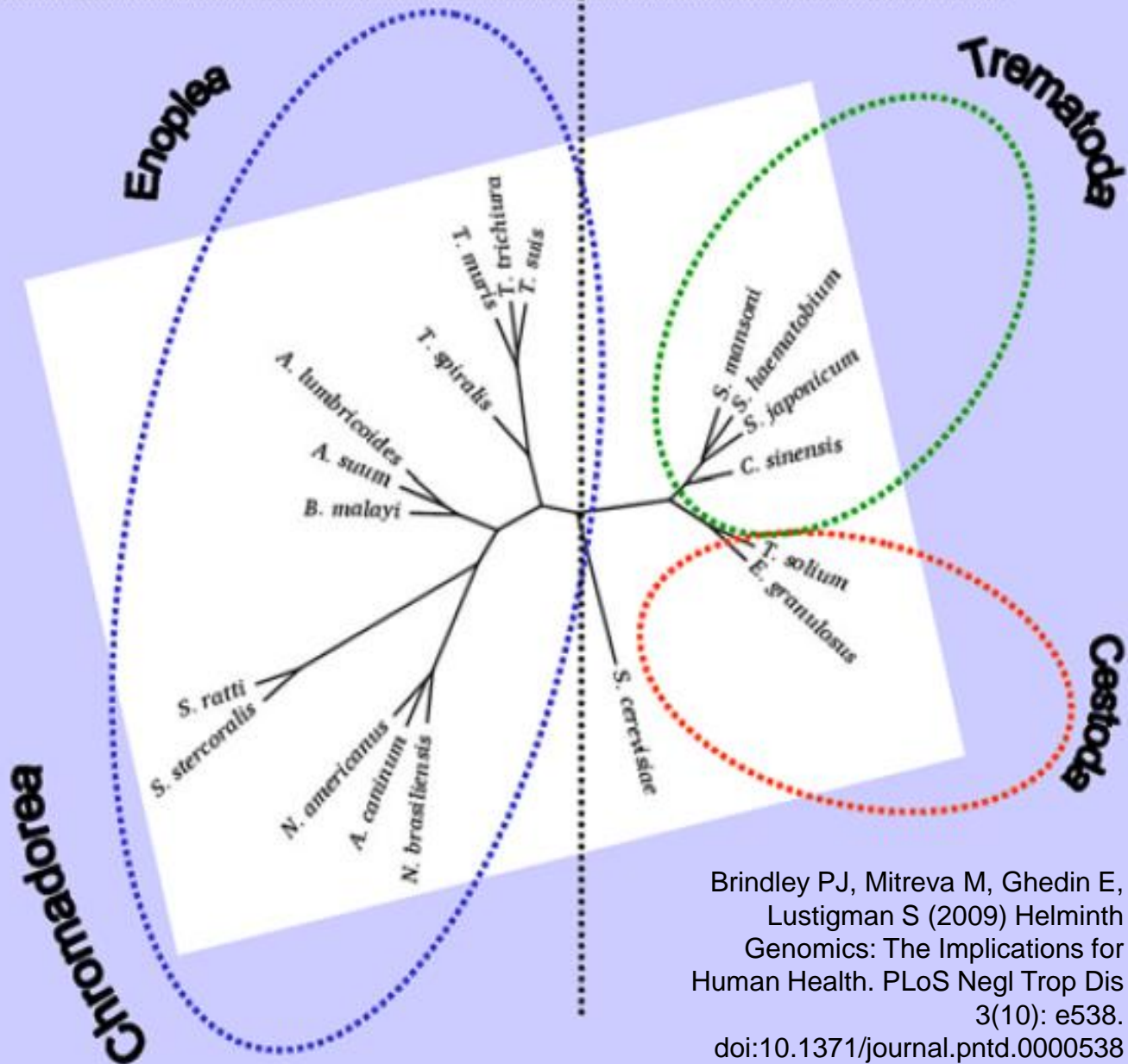
Classes

Enoplea

Trematoda

Chromadorea

Cestoda



Brindley PJ, Mitreva M, Ghedin E, Lustigman S (2009) Helminth Genomics: The Implications for Human Health. PLoS Negl Trop Dis 3(10): e538. doi:10.1371/journal.pntd.0000538

Figure 2. Phylogeny of the major taxa of human helminths—nematodes and platyhelminths—as established by maximum likelihood (ML) analysis of 18S ribosomal RNA from 18 helminth species.

Table 1. Human parasitic helminths (and their close relatives) with genome sequencing projects completed or underway.

Phylum or Class	Species	Common Name / Disease	Primary host	Genome size, Mb	GenBank Project ID	cDNAs (3730 ABI), 1,000 s	Genome Sequencing Status	Sequencing Institute ^a
Nematoda (roundworms)								
Clade V ^b	<i>Necator americanus</i>	Hookworm/necatoriasis	Human	—	20369	5	In progress	WUGC
	<i>Ancylostoma caninum</i>	Model hookworm	Dog	344	12841	81	Improving draft	WUGC
	<i>Nippostrongylus brasiliensis</i>	Model hookworm	Rat	—	20445	14.7	In progress	SI
Clade IV	<i>Strongyloides stercoralis</i>	Threadworm/strongyloidiasis	Human	—	—	11.4	In progress	SI
	<i>S. ratti</i>	Model threadworm	Rat	—	—	27.4	In progress	SI/WUGC
Clade III	<i>Ascaris lumbricoides</i>	Large roundworm/ascariasis	Human	230	—	1.8	In progress	SI
	<i>A. sum</i>	Model large roundworm	Pig	230	—	55.7	Improving draft	WUGC/SI
	<i>Brugia malayi</i>	Filaria/lymphatic filariasis	Human	96	9549	26.2	Improving draft	TIGR/University of Pittsburgh
	<i>Loa Loa</i>	Filaria/loiasis (cutaneous filariasis)/African eye worm	Human	—	—	3.3	In progress	BI
	<i>Onchocerca volvulus</i>	Filaria/river blindness	Human	150	—	15	In progress	SI
	<i>Acanthocheilonema viteae</i>	Model filaria	Rodent	—	33239	0	In progress	UMIGS
Clade I	<i>Trichinella spiralis</i>	Trichina worm/trichinosis	Pig to human	71	12605	25.3	Draft completed	WUGC
	<i>Trichuris trichiura</i>	Whipworm/trichuriasis	Human	—	—	0	In progress	SI
	<i>T. muris</i>	Model whipworm	Mouse	96	—	7	In progress	SI
	<i>T. suis</i>	Model whipworm	Pig	-	—	0	In progress	WUGC
Cestoda (tapeworms)	<i>Echinococcus multilocularis</i>	Tapeworm/alveolar hydatidosis	Rodent; larva infects humans	150	—	1	In progress	SI
	<i>E. granulosus</i>	Tapeworm/unilocular hydatidosis	Canids; larva infects humans	150	12620	10	In progress	SI
	<i>Taenia solium</i>	Pork tapeworm/taeniasis/cysticercosis	Human	270	17815	25	Draft completed	Mexico City
Trematoda (flukes)	<i>Schistosoma mansoni</i>	Blood fluke/intestinal schistosomiasis	Human	390	12599	206	Draft completed	SI/TIGR
	<i>S. haematobium</i>	Blood fluke/urinary schistosomiasis	Human	—	12616	0	In progress	SI
	<i>S. japonicum</i>	Blood fluke/intestinal schistosomiasis	Human	400	29491	104	Draft completed	CNHGC
	<i>Clonorchis sinensis</i>	Liver fluke/donorchiasis	Human	—	17975	3	In progress	SNUCM

^aWUGC, Washington University's Genome Center.

^bPhylogeny based on Blaxter et al. [47].

BI, Broad Institute; CNHGC, Chinese National HGC; SI, Sanger Institute; SNUCM, Seoul National University College of Medicine; TIGR, The Institute for Genomic Research (now JCVI).

doi:10.1371/journal.pntd.0000538.t001

Cestodes

Introducción



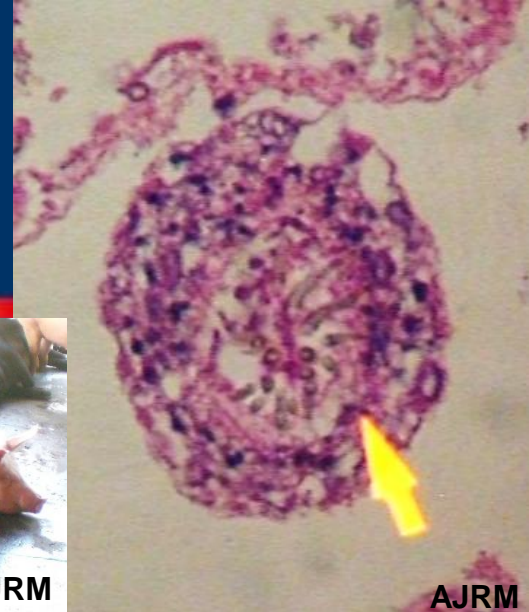
T. saginata
(foto AJRM)

T. solium
(foto AJRM)

- ¿Como se clasifican los helmintos?
 - Nematelmintos (*gusanos redondos*) (*roundworms*)
 - Platelminos (*gusanos planos*) (*flatworms*)
 - Tremátodes (*duelas*) (*flukes*)
 - Transmisión percutánea*
 - *Schistosoma* (sanguíneo)
 - Transmisión alimentaria*
 - *Fasciola* (tisular: hígado)
 - *Paragonimus* (tisular: pulmón)
 - Otros: *Clonorchis* (tisular: hígado), *Opisthorchis* (tisular: hígado)
 - Cestodes (*acintados*) (*tapeworms*)
 - *Taenia* (complejo teniasis-cisticercosis)
 - *Echinococcus* (hidatidosis)

Cestodes

Taxonomía



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- Eukaryota (super reino);
 - Opisthokonta;
 - Metazoa (reino);
 - Eumetazoa;
 - » Bilateria: Platyhelminthes (P): **Trematoda** (clase)
 - » Bilateria: Platyhelminthes (Phylum): **Cestoda** (clase)
 - » Eucestoda (sc); Cyclophyllidea (o); Taeniidae (f); **Taenia**
 - » **T. solium** (Adulto: Teniasis; Larva: Cisticercosis: **Cysticercus cellulosae**).
 - » **T. saginata** (Adulto: Teniasis).
 - » Eucestoda (sc); Cyclophyllidea (o); Taeniidae (f); **Echinococcus**
 - » **E. granulosus** (perros), **E. multilocularis**
 - » Eucestoda (sc); Cyclophyllidea (o); Hymenolepididae (f); **Hymenolepis**
 - » **H. nana, H. diminuta** (ratas)
 - » Eucestoda (sc); Cyclophyllidea (o); Dipylidiidae (f); **Dipylidium caninum** (perros)
 - » Eucestoda (sc); Diphyllbothriidea (o); Diphyllbothriidae (f); **Diphyllbothrium latum** (pescado)



AJRM



AJRM



AJRM

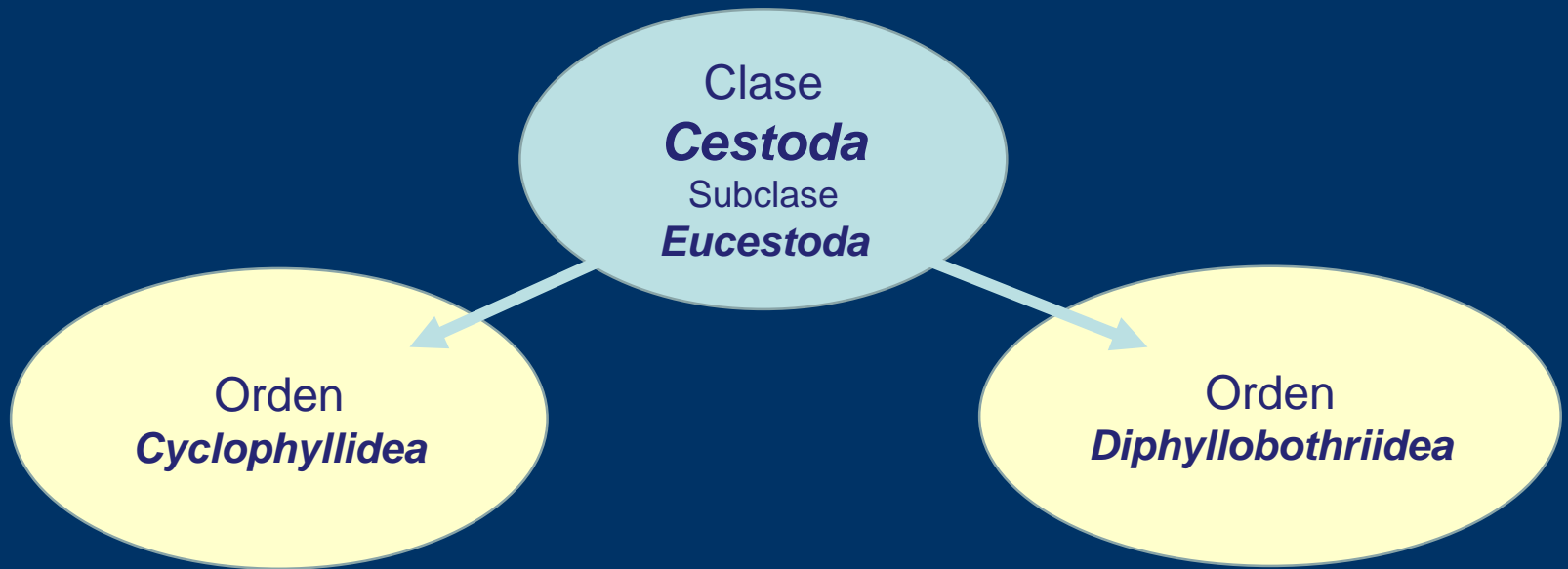


Taxonomy
Browser

Cestodes

Taxonomía

Eucestoda de Mayor Relevancia Médica



Familias

Taeniidae *Taenia*
Echinococcus

Hymenolepididae
Hymenolepis

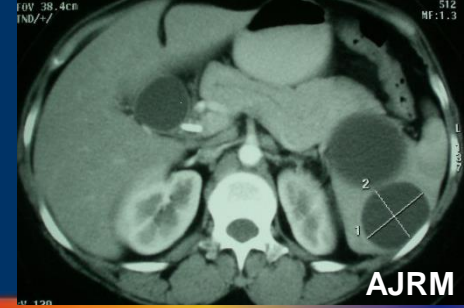
Dipylidiidae
Dipylidium

Familia

Diphylobothriidae
Diphylobothrium

Cestodes

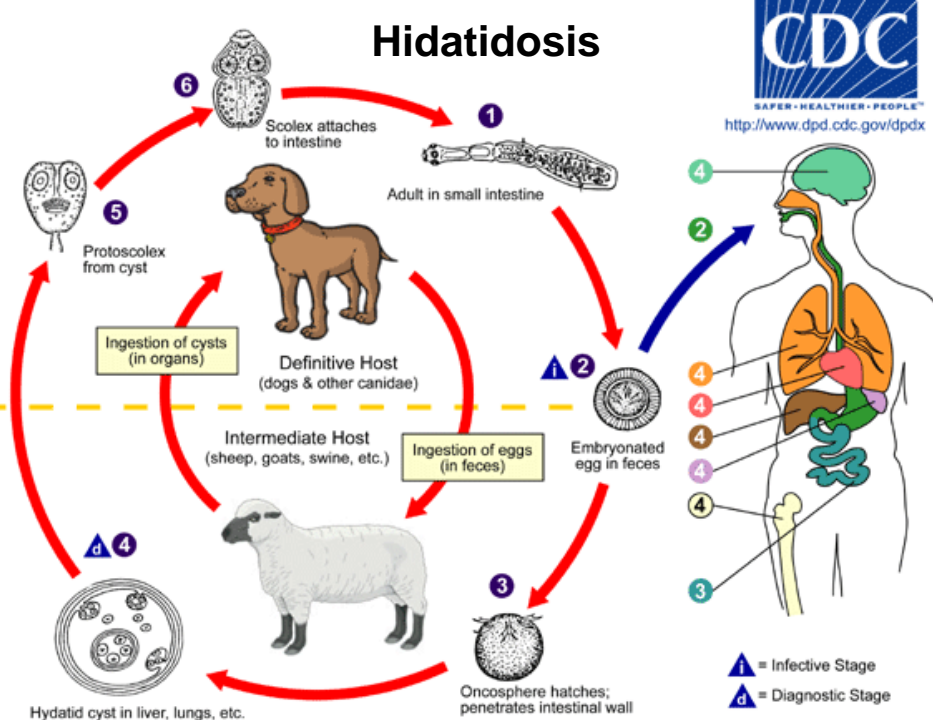
Espectro de patología



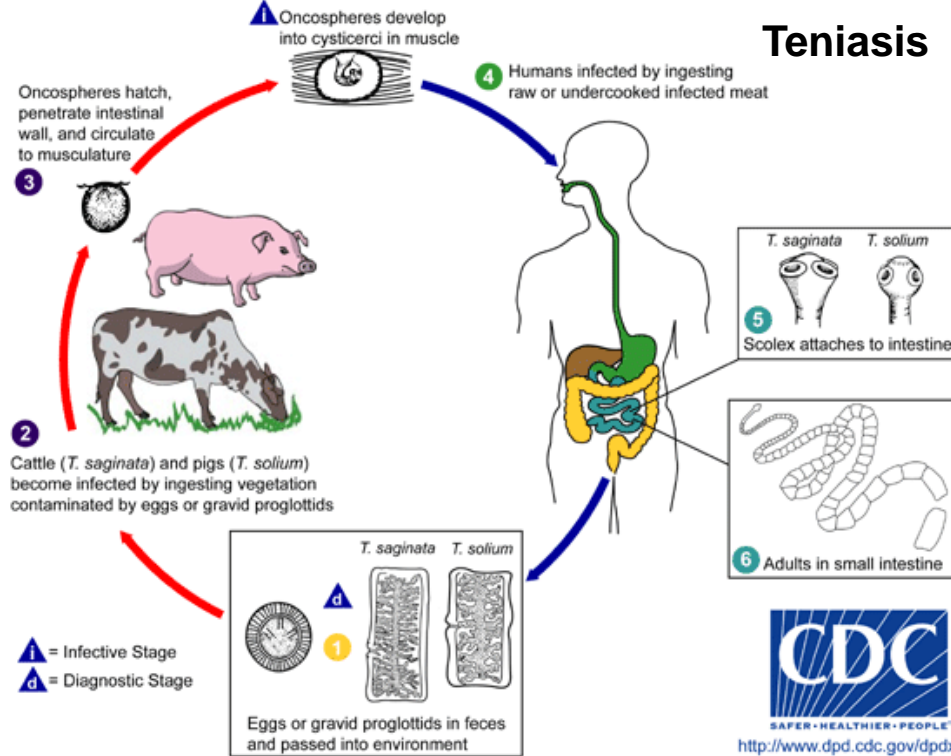
- Los cestodes pueden parasitar al hombre y a los animales en sus fases
 - Larvaria
 - Adulta
- Por lo tanto, la importancia del estudio del binomio larva-adulto, radica en que la patología que se produce por cada estadio parasitario es diferente.

PARÁSITO	LARVA	ENFERMEDAD
<i>Taenia sp</i>	Cisticerco	Cisticercosis
<i>Echinococcus sp</i>	Hidatide	Hidatidosis
<i>Multiceps sp</i>	Coenurus	Coenuriasis
<i>Spirometra sp</i>	Sparganum	Esparganosis simple
?	<i>Sparganum proliferum</i>	Esparganosis proliferativa

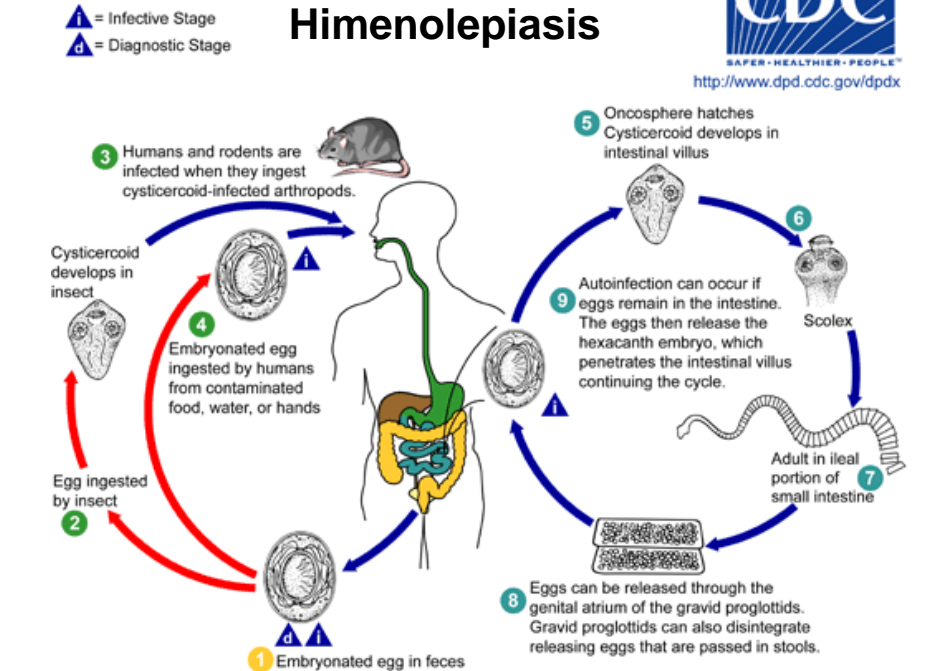
Hidatidosis



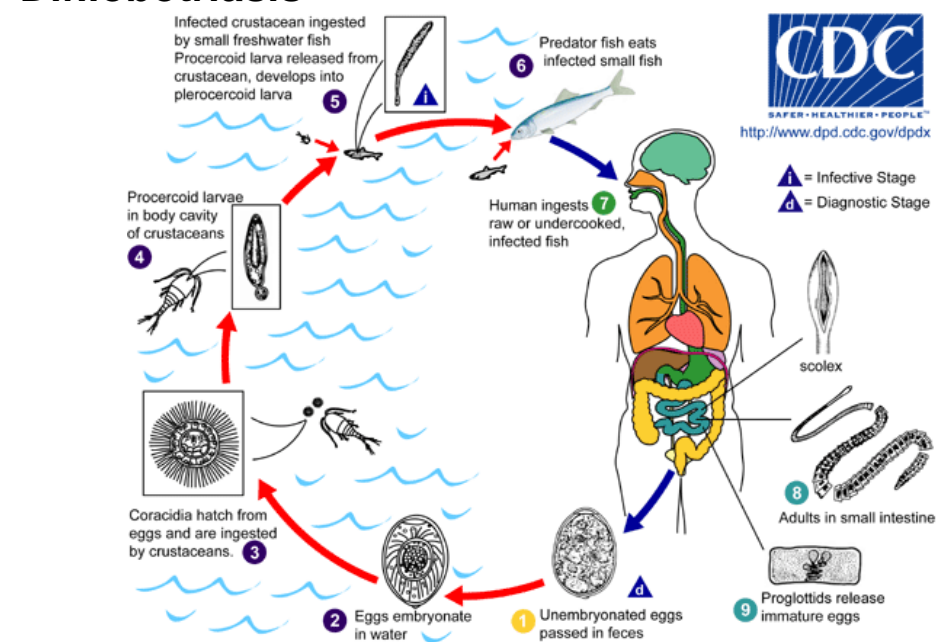
Teniasis



Himenolepiasis



Difilobotriasis



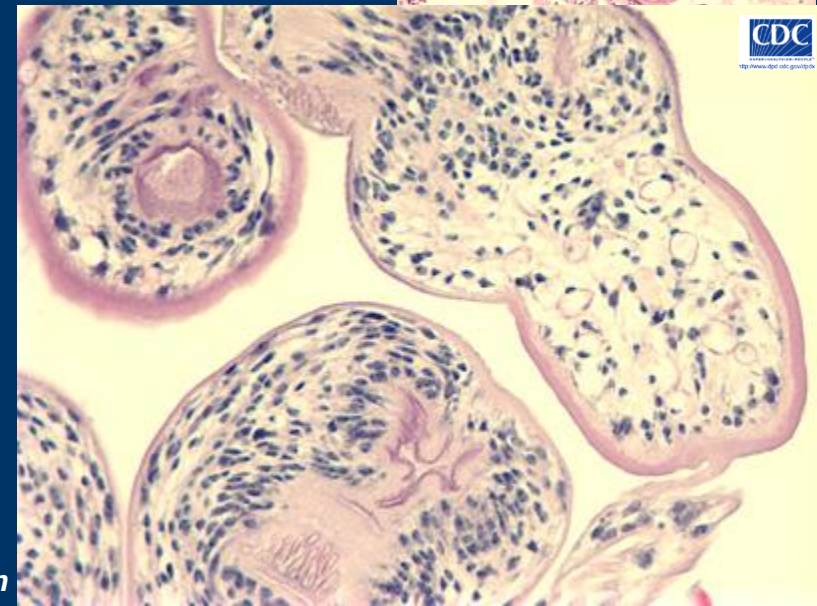
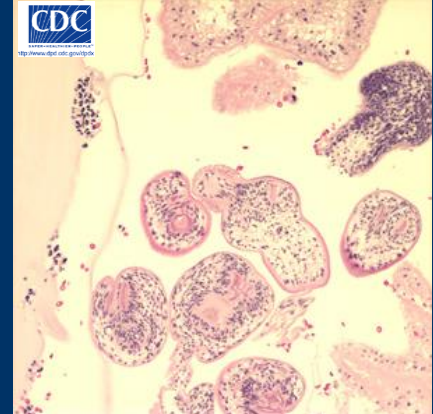
Cestodes

Hidatidosis (CIE-10 B67.0)



- Aspectos generales de la hidatidosis

- La hidatidosis es una zoonosis parasitaria y de transmisión alimentaria de alta endemicidad en el mundo, incluyendo países de América del Sur, como Colombia.
- La enfermedad es una infección paraténica en el ser humano y en otros animales que sirven como hospedadores accidentales de las diferentes especies causales
- Agentes etiológicos
 - *Echinococcus granulosus* (forma quística, cística o unilocular)
 - *Echinococcus multilocularis* (forma alveolar o multilocular)
 - *Echinococcus vogeli* (forma poliquistica)
 - *Echinococcus oligarthrus* (forma poliquistica)



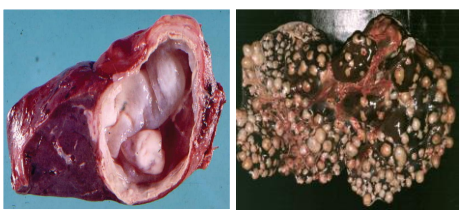
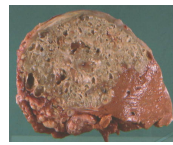
Protoescolices de un quiste hidatídico de pulmón

Hidatidosis

Características Generales

TABLE 1. Forms of echinococcosis in humans^a

Name of disease (according to WHO/OIE; [223])	Cystic echinococcosis	Alveolar echinococcosis	Polycystic echinococcosis
Causative agent	<i>E. granulosus</i>	<i>E. multilocularis</i>	<i>E. vogeli</i>
Other names of the disease	Hydatid disease, hydatidosis	Alveolar hydatid disease	<i>E. vogeli</i> echinococcosis, neotropical echinococcosis
Adult parasite			
Length (mm)	2.0–7.0	1.2–4.5	3.9–5.6
No. of proglottids	3 (4–6)	5 (2–6)	3
Definitive hosts	Domestic dog, wild canids (coyote, dingo, red fox, etc.)	Red fox, arctic fox, raccoon dog, coyote, domestic dog, cat	Bush dog, domestic dog
Intermediate hosts	Primarily ungulates, also marsupials	Rodents, other small mammals	Rodents: paca and agouti
Geographic distribution of the parasite	Worldwide	North America, northern and central Eurasia	Central and South America
Larval parasite in humans			
Organ localization	Visceral, predominantly liver and lungs	Visceral, primarily liver, metastases in lungs, brain, bones, etc.	Visceral, mainly liver, abdomen, lungs
Morphology	Fluid-filled mostly solitary (and less frequently multiple) cysts, unilocular or multichambered, diam 1–>15 cm (Fig. 2); often with protoscoleces	Masses of numerous small cysts (diam microscopic up to 3 cm), often interconnected, surrounded by dense connective tissue, no cyst fluid, appearance of cheeselike mass, sometimes with central necrosis (Fig. 7); rarely a few protoscoleces	Polycystic; fluid-filled cysts, diam up to 4–6 cm, solitary, but often aggregated, interconnected and multichambered; thick laminated layer; protoscoleces frequently present
Type of growth in humans	Concentric expansion	Exogenous proliferation, tumorlike, infiltrative	Exogenous and endogenous proliferation



Hepatic CE in a patient (endocyst removed; lesion size approximately 3 by 3.5 cm).

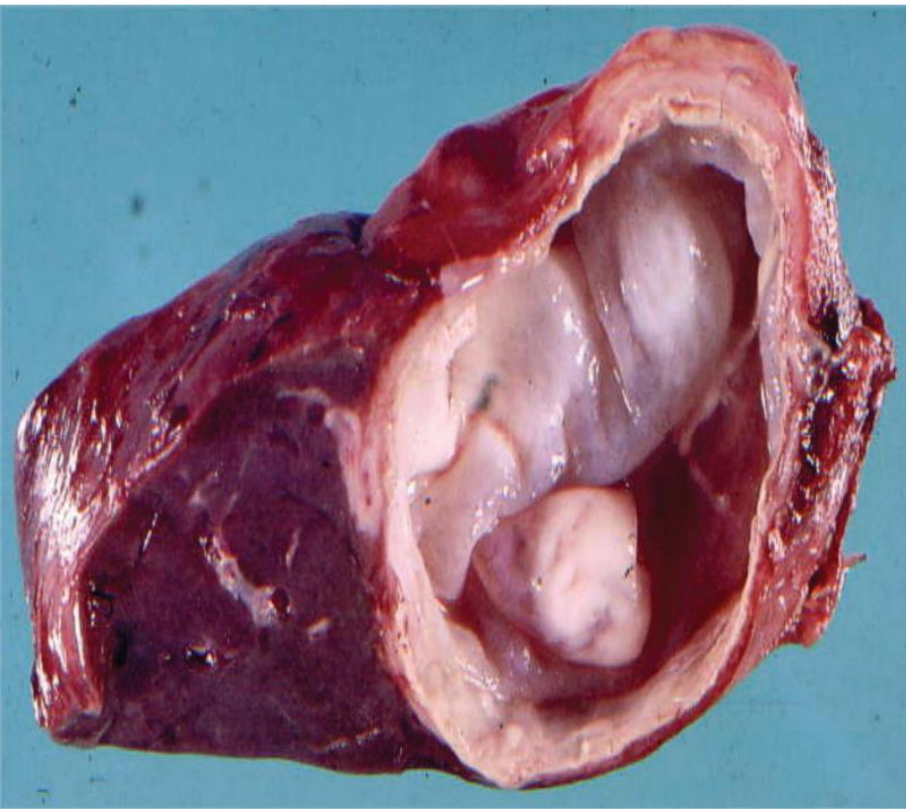
Horse liver with multiple cysts of *E. granulosus* (cyst diameters approximately 1 to 10 cm). The horse exhibited clinical signs of the disease.

Hidatidosis

Patología

Hidatidosis quística

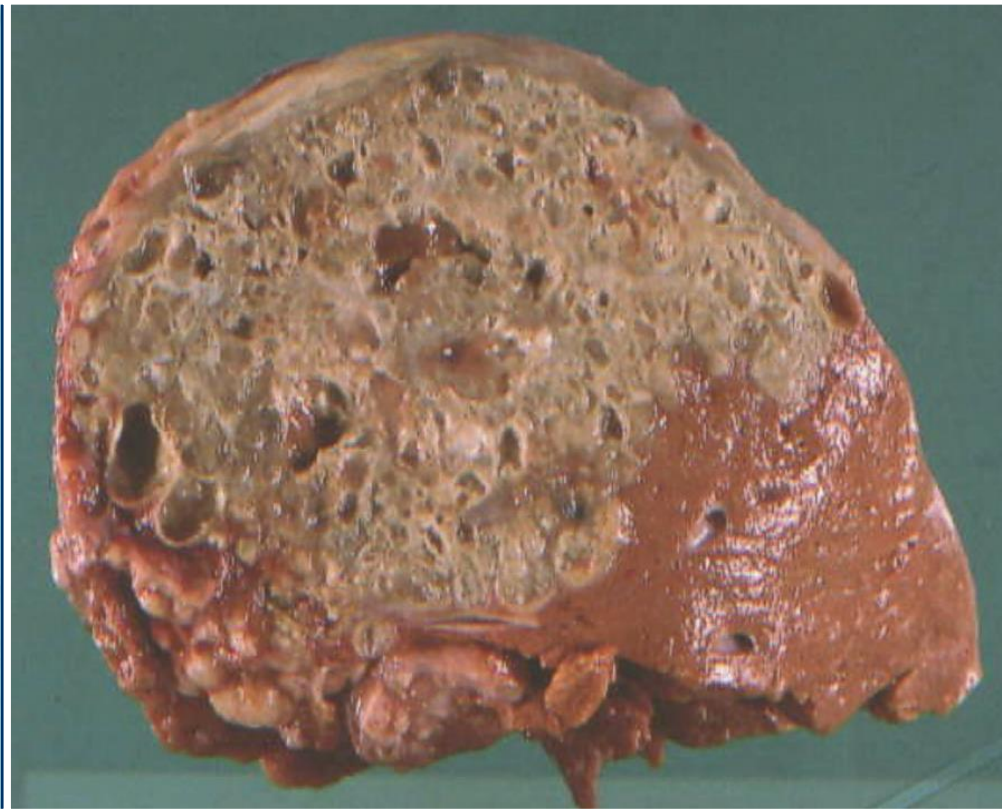
Echinococcus granulosus



Hepatic CE in a patient
(endocyst removed; lesion size approximately
3 by 3.5 cm).

Hidatidosis alveolar

Echinococcus multilocularis



Hepatic alveolar echinococcosis in a
62-year-old Swiss patient
(maximum diameter of single cysts approximately 1.5 cm).

Cestodes

Hidatidosis (CIE-10 B67.0)

- **Morfología del parásito**

- En el pasado se consideraba parte del género *Taenia*
- Es la más pequeña de las tenias, por lo cual también se le conoce como la tenia minuta de los perros
- En el ser humano solo se encuentran estadios larvarios
- En el ser humano NO se desarrolla la forma adulta
- Forma larvaria en el ser humano: quiste hidatídico
- Adulto (en otros hospedadores, animales)
 - Tiene escólex, cuello y un estróbilo con tres segmentos
 - Mide 8 mm de longitud

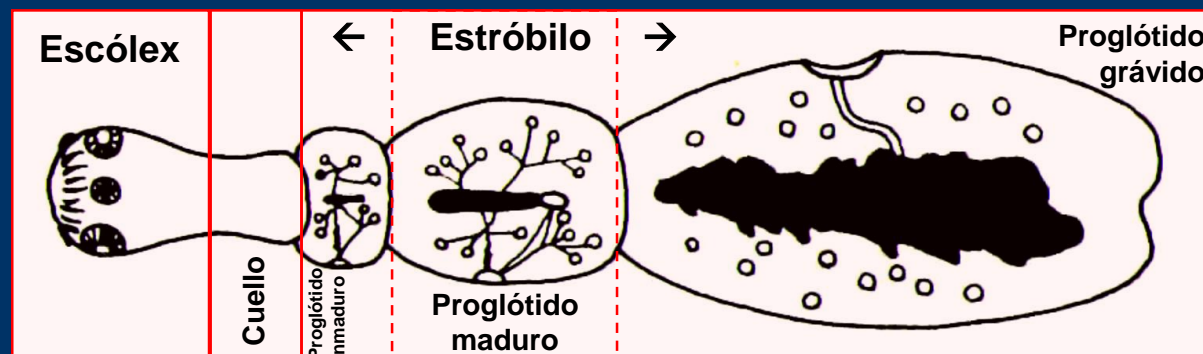


Figure 39. *Echinococcus granulosus*

Cestodes

Hidatidosis (CIE-10 B67.0)

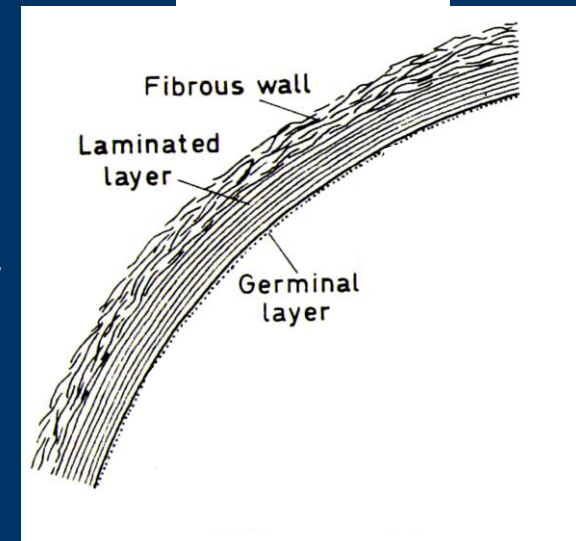
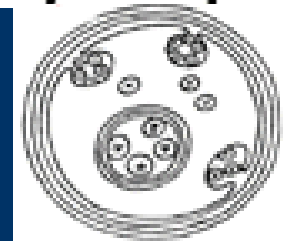
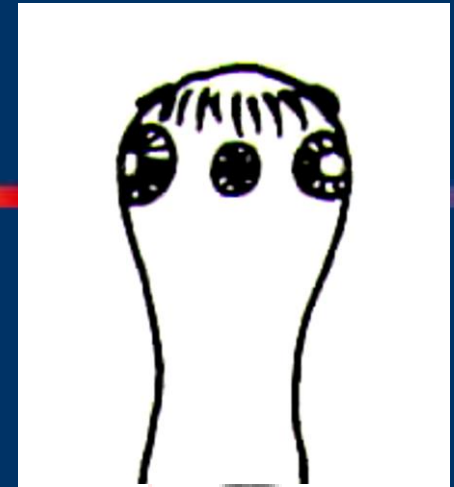
- **Morfología del parásito**

- **Escólex**

- Redondo, mide cerca de 0,3 mm de diámetro, con 4 ventosas ovals y un rostelo con dos filas de ganchos (que totalizan aproximadamente 35)

- **Quiste hidatídico**

- El hombre se infecta con la forma larvaria por ingestión de huevos proveniente de las heces del hospedador definitivo (principalmente el perro)
 - Posterior a la ingestión el huevo pierde su envoltura y el embrión es liberado al intestino delgado
 - Allí penetra la pared hasta alcanzar el torrente sanguíneo donde se anida en los capilares
 - Esto ocurre principalmente en el hígado y los pulmones
 - Pero puede ocurrir en cualquier órgano
 - Después de 6-10 días los ganchos del embrión se pierden y el embrión se vuelve vacuolado para formar un pequeño quiste, llamado hidátide, que significa tipo acuoso
 - El quiste tiene una capa germinal rodeada de una pared hialina
 - Como consecuencia de la reacción inmunitaria se forma una pared fibrosa (células gigantes, endoteliales y eosinófilos)



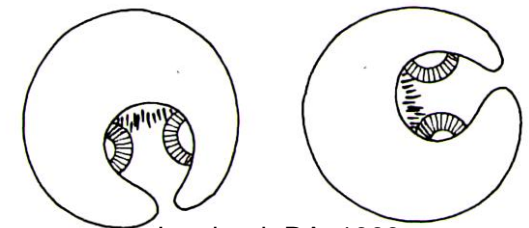
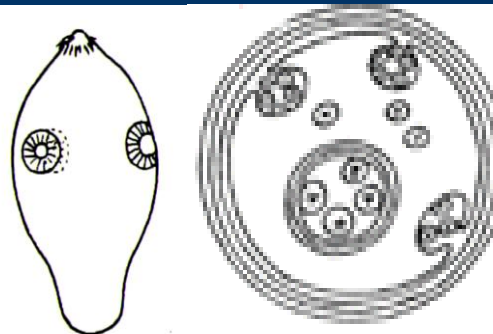
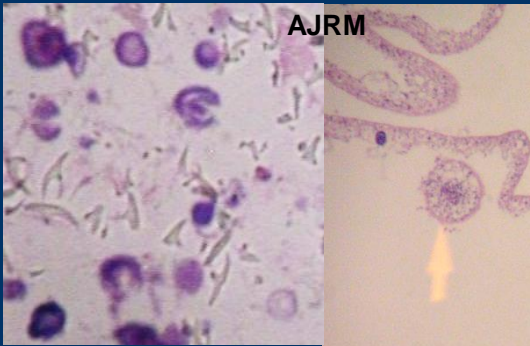
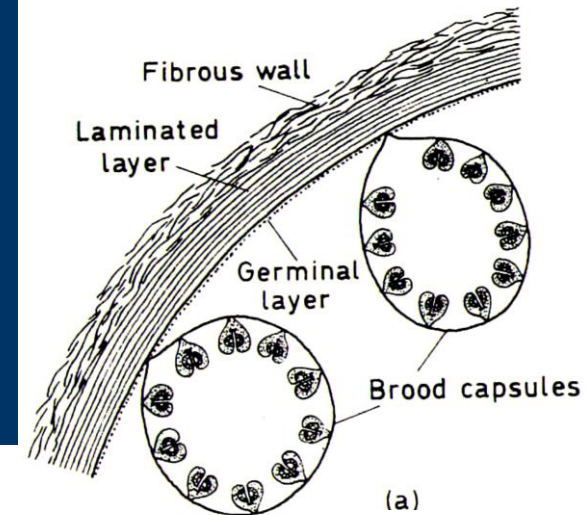
Cestodes

Hidatidosis (CIE-10 B67.0)

• Morfología del parásito

– Quiste hidatídico

- Inicialmente puede medir 30-50 μm , a las 6 horas 200 μm .
- El quiste crece lentamente pudiendo alcanzar en 4-6 meses un tamaño de unos 10 mm de diámetro.
- La pared hialina se vuelve laminada y la capa germinal produce pequeñas vesículas unidas por una capa simple de células germinales
- Estas vesículas crecen y en su interior desarrollan cápsulas que contienen escólices invaginados que tienen 4 ventosas y un roseto con dos filas de ganchos
- La cavidad del quiste se llena con fluidos que contienen sales (NaCl), agua, glucosa, albúmina, grasas, enzimas y sustancias tóxicas, tiene propiedades antigénicas, llamado líquido quístico
- Allí se liberan los escólices, ganchos desprendidos, y gránulos que producen la llamada “arenilla hidatídica”



Lamberth RA, 1969.

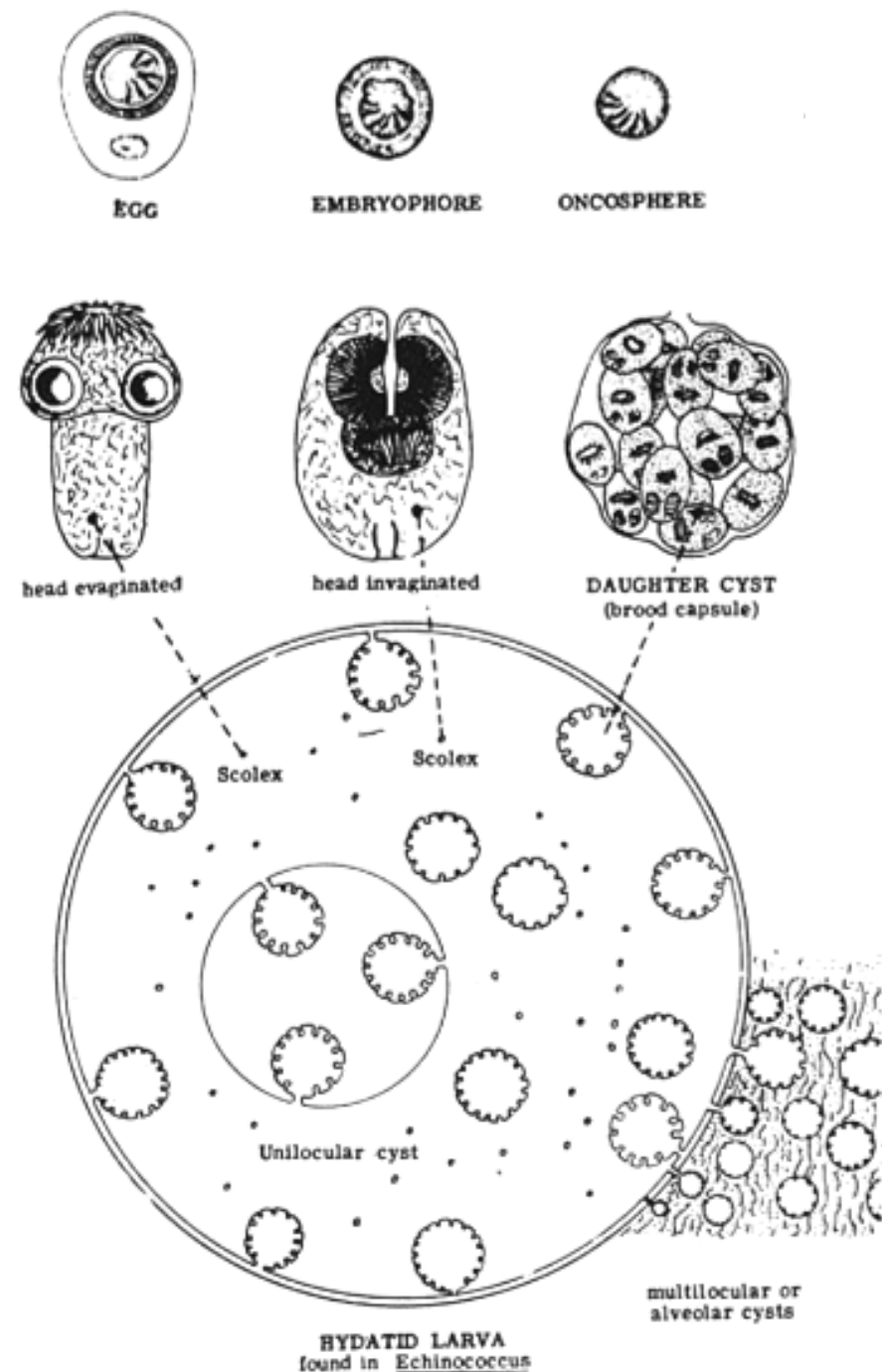
Cestodes

Hidatidosis (CIE-10 B67.0)

- **Morfología del parásito**

- **Quiste hidatídico**

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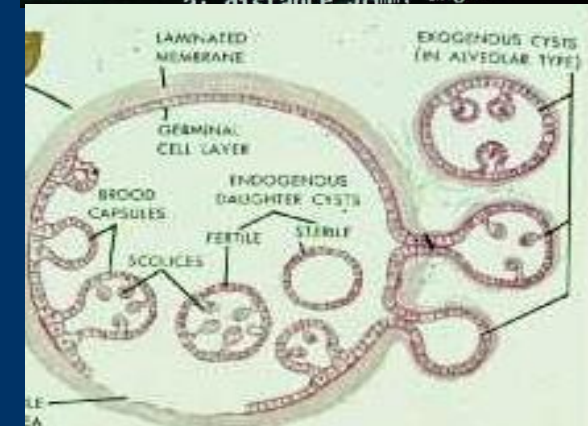
Cestodes

Hidatidosis (CIE-10 B67.0)

- **Morfología del parásito**

- **Quiste hidatídico**

- Si el quiste se rompe los escólices liberados serán capaces de desarrollar nuevos quistes en el mismo órgano
 - Estos quistes secundarios son uniloculares
 - En el caso de la infección por *E. multilocularis*
 - La capa germinal prolifera a través de los tejidos para formar pequeños quistes
 - Estos quistes se llena de una sustancia gelatinosa y usualmente son estériles de escólices
 - Estos escólices forma los quistes multiloculares o hidátides alveolares
 - Estructuralmente el quiste está formado por una esfera o vesícula llena de líquido que unida a la membrana adventicia vecina forma el quiste hidatídico; externamente está conformado por una capa laminada, lechosa, opaca, no nucleada correspondiendo a la cutícula mide +/- 10 mm es semipermeable, luego esta la capa interna, llamada capa germinativa o prolígera porque da origen a un gran número de escólices que se desprenden por gemación al interior de la cavidad quística, esas proyecciones se denominan cápsulas prolíferas en las que internamente estan los protoescólices. Las cápsulas o vesículas prolíferas libres y escólices libres constituyen la llamada Arenilla hidatídica



Cestodes

Hidatidosis (CIE-10 B67.0)

- Morfología del parásito
 - Quiste hidatídico

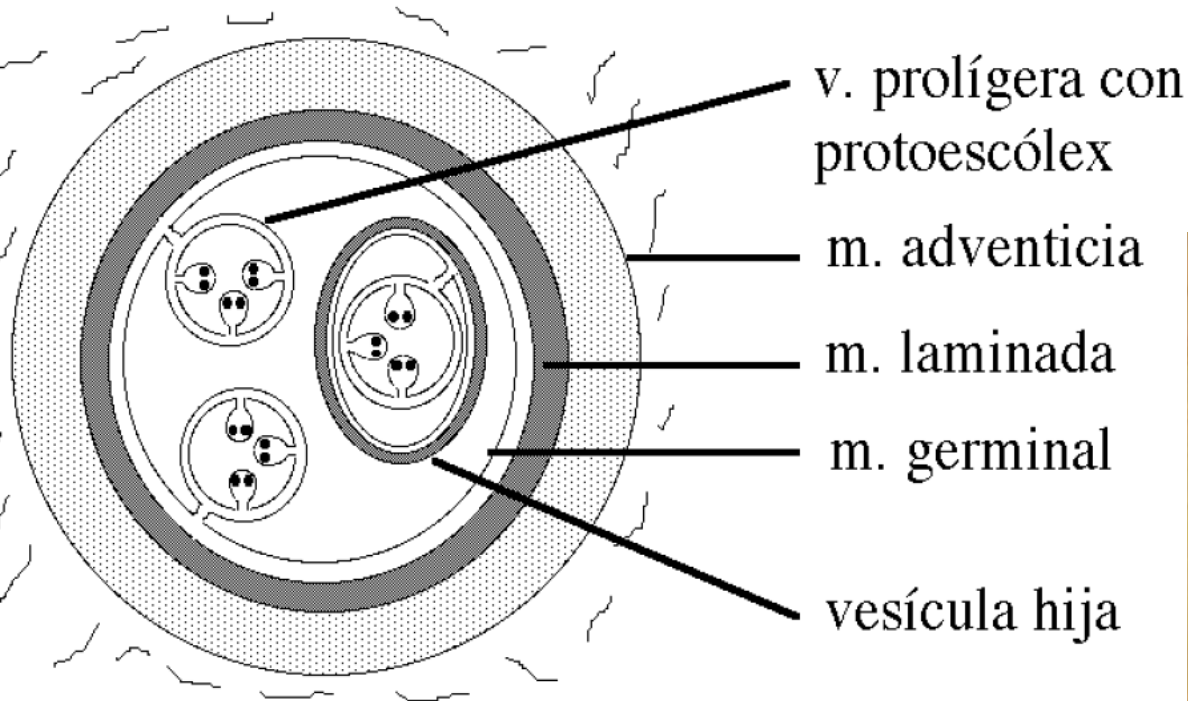


Fig. 102 a. Esquema de quiste hidatídico



Fig. 102 b. Quiste hidatídico observa un protoescoléx

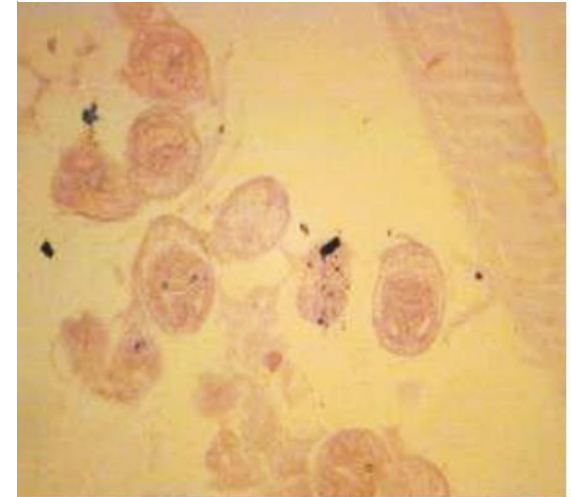


Fig. 102 c. Quiste con se arenilla hidatídico

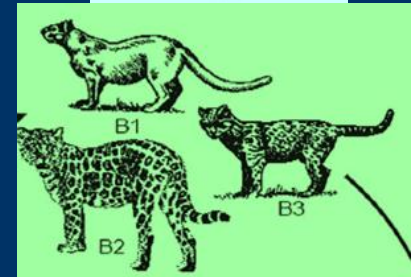
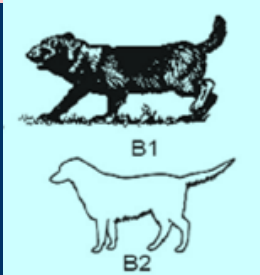
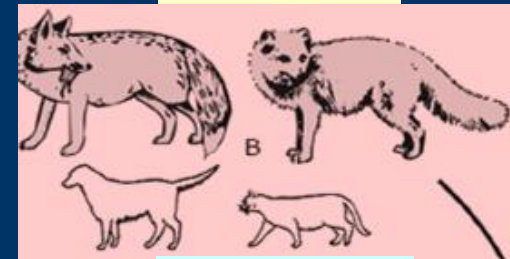
Cestodes

Hidatidosis (CIE-10 B67.0)

- **Morfología del parásito**

- **Habitat (hospedador definitivo):**

- *E. granulosus*: intestino delgado del perro doméstico
 - *E. multilocularis*: intestino delgado de zorros, infrecuentemente perros domésticos y otros cánidos, también gatos
 - *E. vogeli*: intestino delgado de perros venaderos o perros de monte, infrecuentemente perros domésticos
 - *E. oligarthrus*: intestino delgado de felinos salvajes: puma, jaguar, ocelote

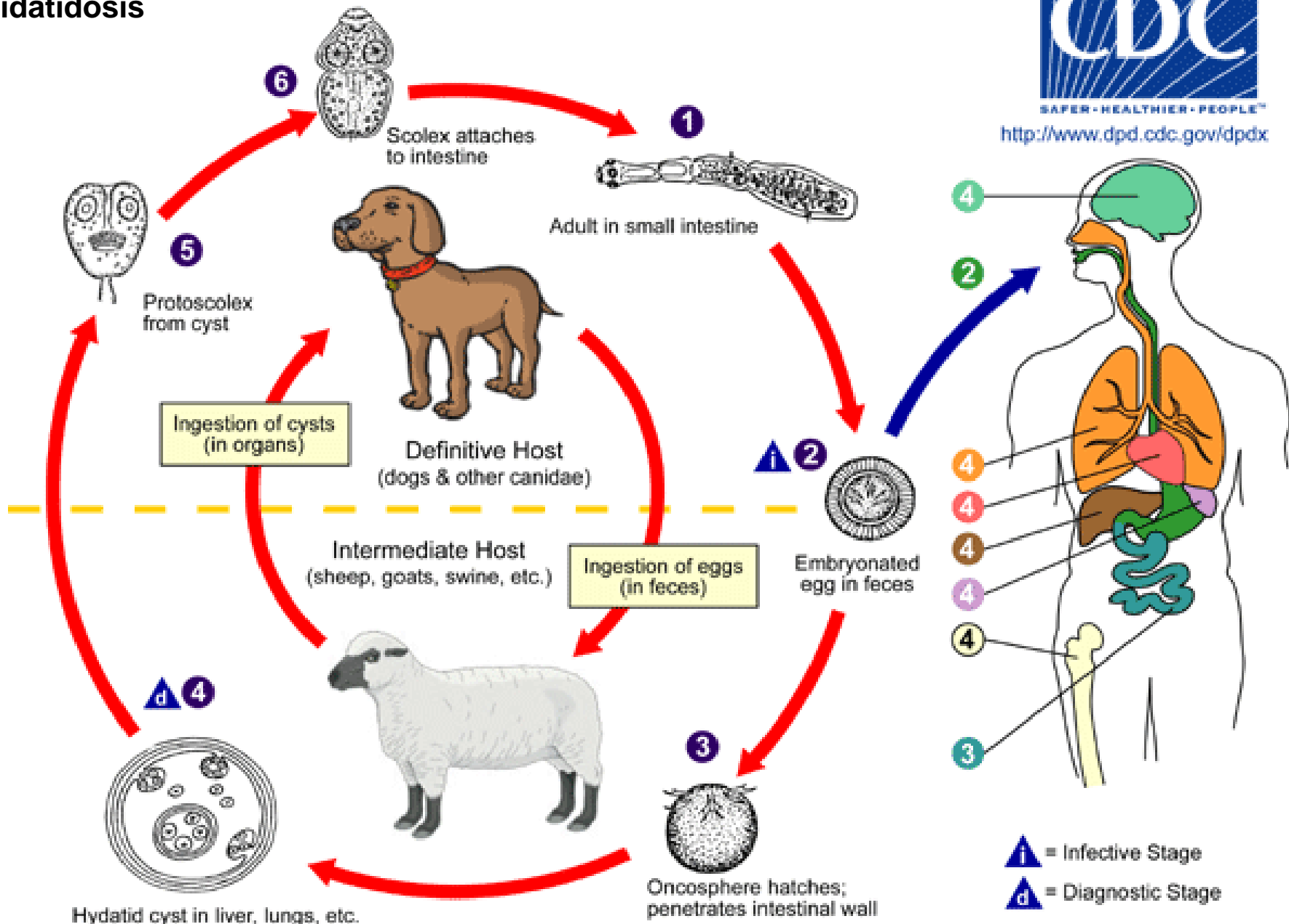


Ciclos generales de la Hidatidosis



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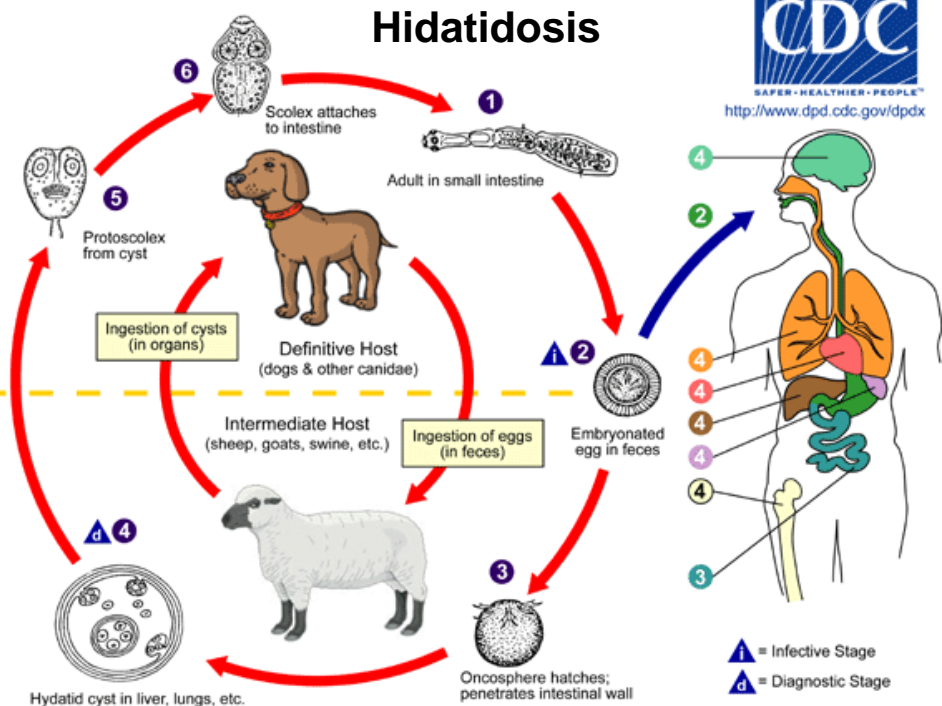
<http://www.dpd.cdc.gov/dpdx>



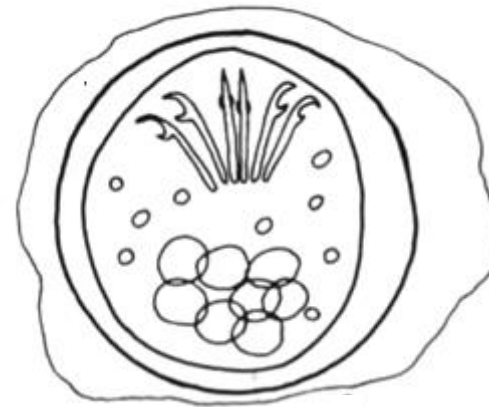
Hidatidosis



SAFER · HEALTHIER · PEOPLE™
<http://www.dpd.cdc.gov/dpdx>

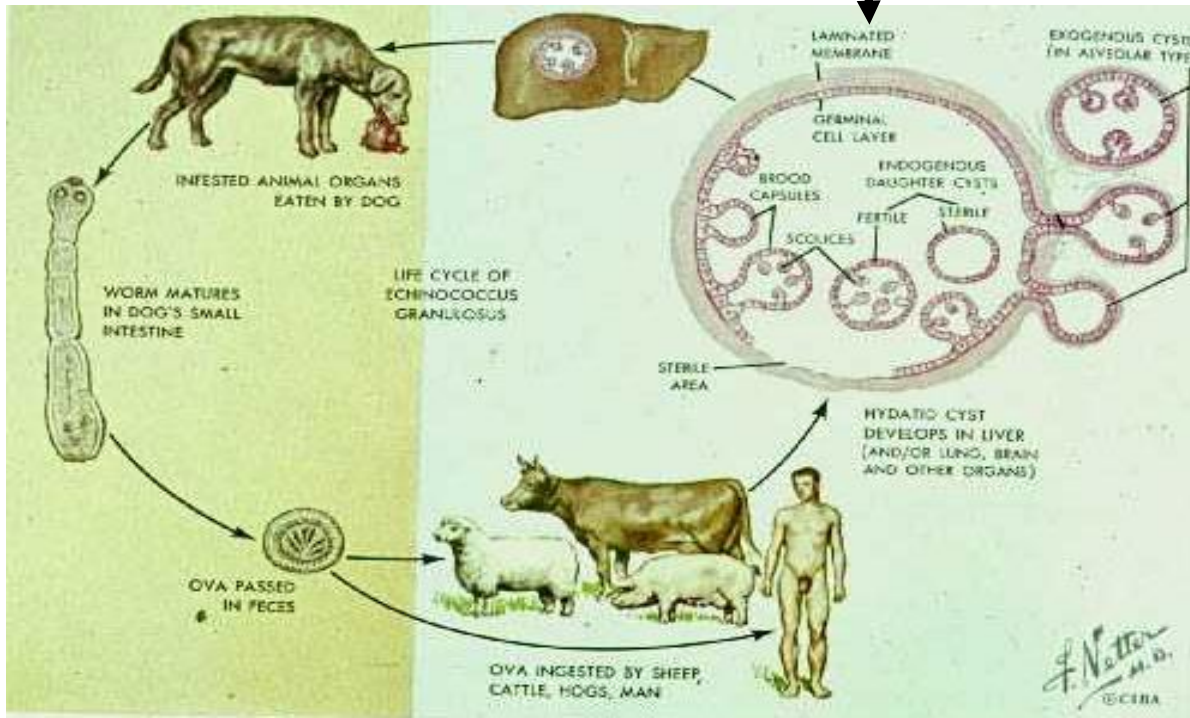


Hexacanto



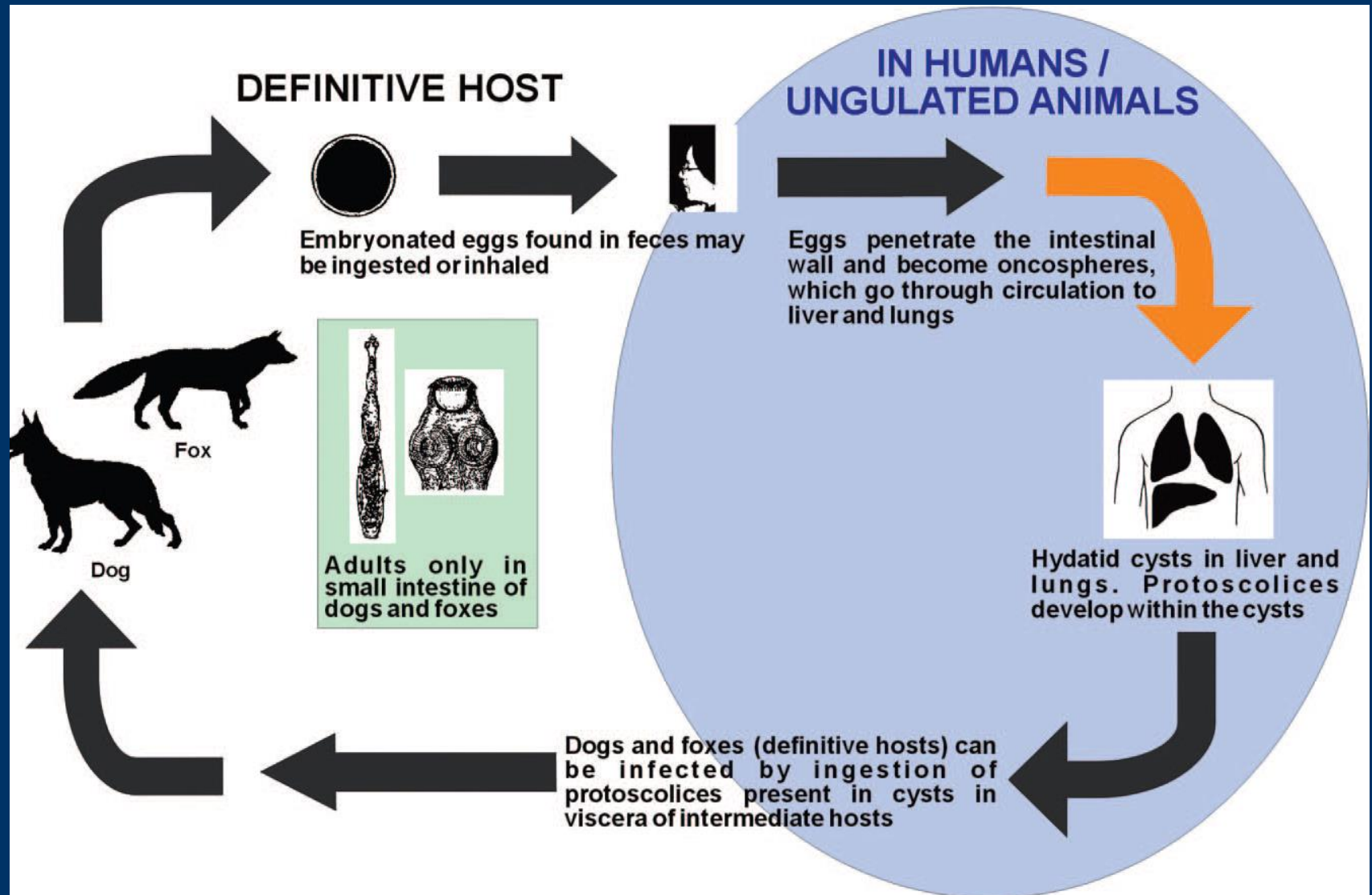
E. granulosus

E. multilocularis



Ciclo de la Hidatidosis

Radiographics. 2005 Jan-Feb;25(1):135-55.



Ciclos de las Hidatidosis Quística y Alveolar

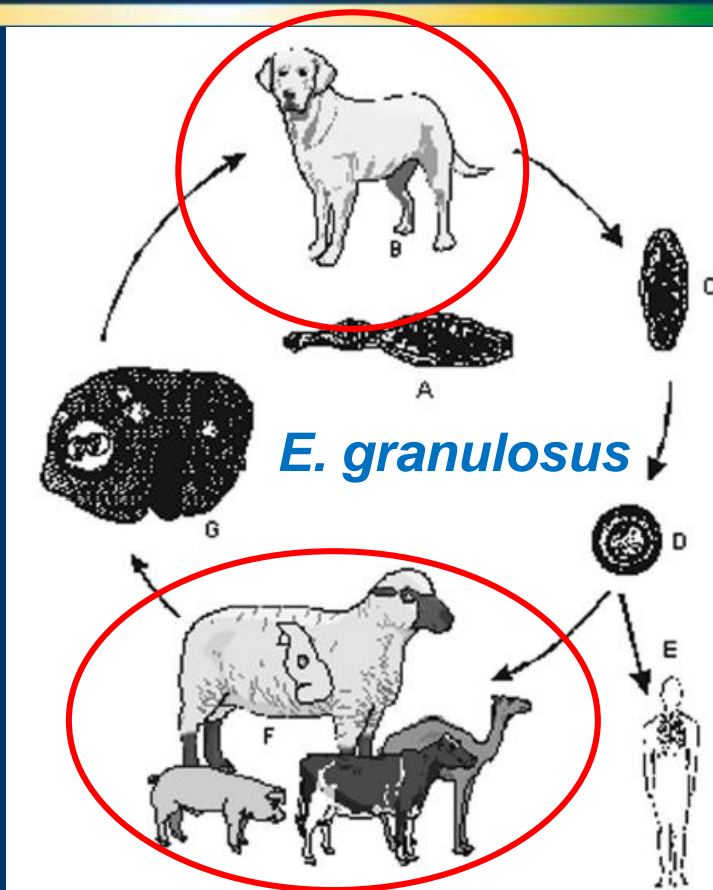


FIG. 1. Life cycle of *E. granulosus* (common sheep strain). (A) Adult parasite. (B) Domestic dog as principal definitive host; wild canids (dingo, hyena etc.) can be involved in the cycle. (C) Proglottid with eggs. (D) Egg with oncosphere. (E) Infection of humans. (F) Sheep as principal intermediate hosts; other ungulates are of lower significance. (G) sheep liver with cysts.

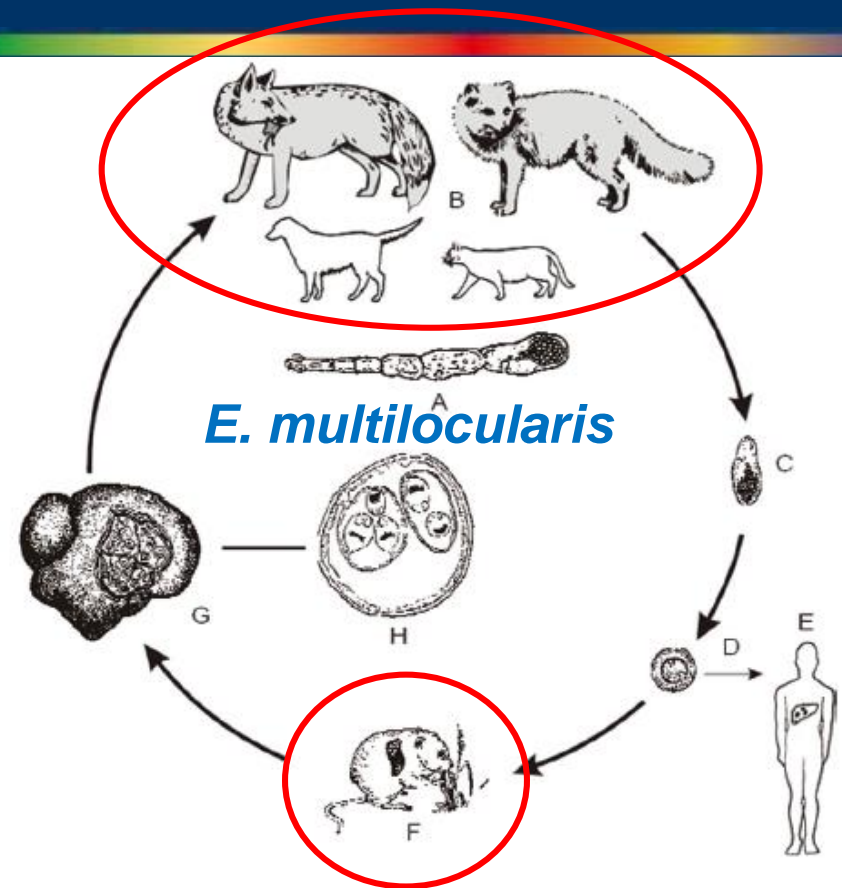


FIG. 6. Life cycle of *E. multilocularis*. (A) Adult parasite. (B) Foxes (left, red fox; right, Arctic fox) as principal definitive hosts; dogs, other canids, and cats can be involved in the cycle. (C) Proglottid with eggs. (D) Egg with oncosphere. (E) Infection of humans. (F) Rodent infected with metacystodes. (G) Rodent liver with metacystodes. (H) single metacystode cyst with protoscoleces.

Ciclos de las Hidatidosis Poliquistica

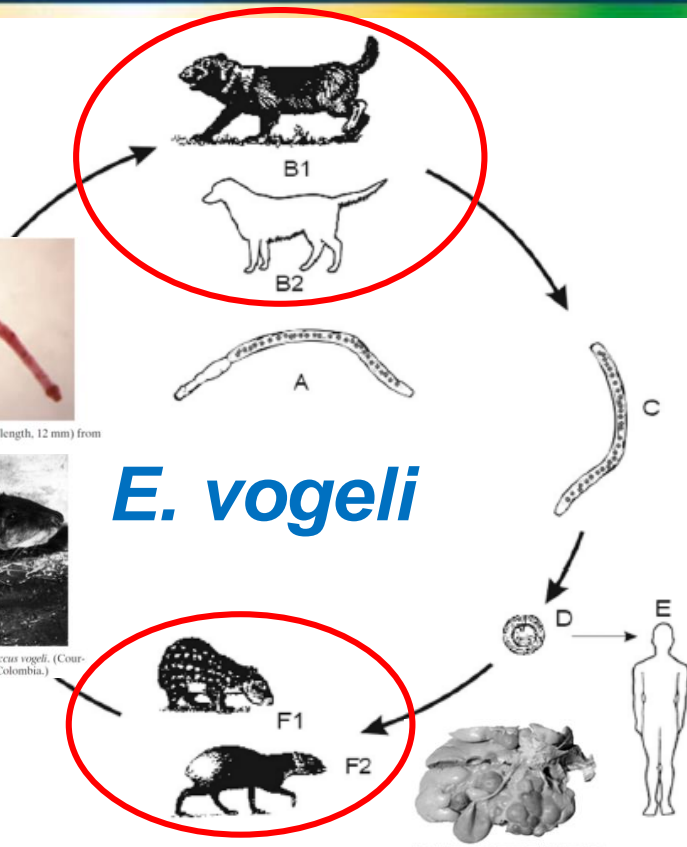


FIG. 5. Strobilar stage of *Echinococcus vogeli* (length, 12 mm) from an experimentally infected domestic dog.



FIG. 3. The paca, intermediate host of *Echinococcus vogeli*. (Courtesy of Ignacio Boreiro, University del Valle, Cali, Colombia.)

FIG. 6. Metacercariae of *Echinococcus vogeli* in the liver of a paca kept as a pet in a household in Cartagena, Colombia.

FIG. 10. Life cycle of *E. vogeli*. (A): Adult parasite. (B) Bush dog (*Speothos venaticus*) as principal definitive host (B1); domestic dogs are rarely infected (B2). (C) Proglottid with eggs. (D) Egg with oncosphere. (E) Infection of humans. (F) Intermediate hosts: paca (*Cuniculus paca*) (F1) and agouti (*Dasyprocta* spp.) (F2). Data from reference 180.

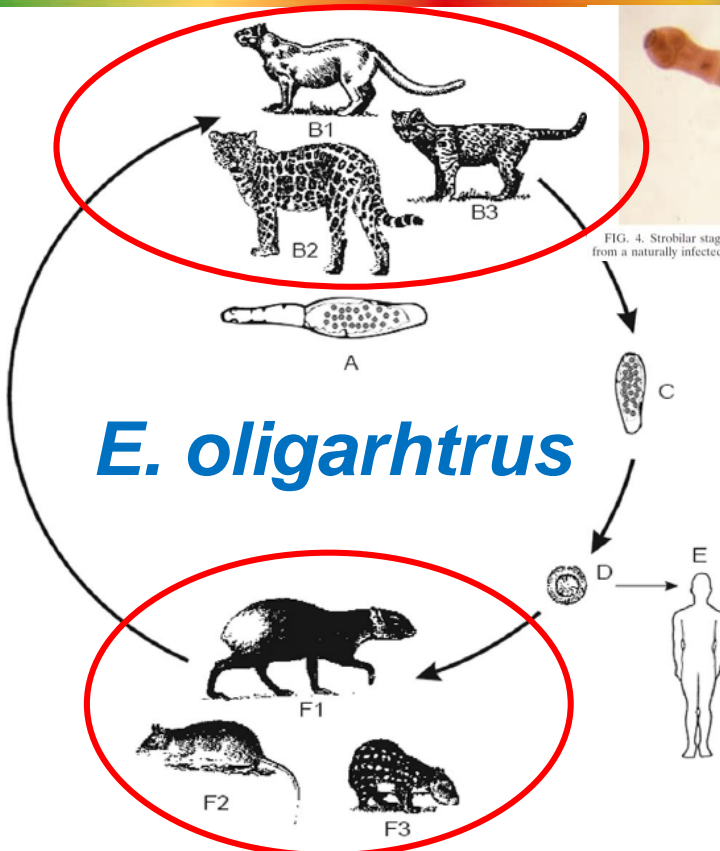


FIG. 4. Strobilar stage of *Echinococcus oligarthus* (length, 2 mm) from a naturally infected jaguarundi from Colombia.

FIG. 11. Life cycle of *E. oligarthus*. (A) adult parasite. (B) Wild felids as definitive hosts: cougar (*Felis concolor*) (B1), jaguar (*Panthera onca*) (B2), and ocelot (*Felis pardalis*) (B3) as examples. (C) Proglottid with eggs. (D) Egg with oncosphere. (E) Infection of humans. (F) Intermediate hosts: agouti (*Dasyprocta* spp.) (F1) spiny rat (*Proechimys* spp.) (F2), and paca (*Cuniculus paca*) (F3). Data from reference 180.

Presencia del perro venadero o de monte

América Latina

CLINICAL MICROBIOLOGY REVIEWS, Apr. 2008, p. 380–401



Presencia de las pacas y de los guatines

América Latina

CLINICAL MICROBIOLOGY REVIEWS, Apr. 2008, p. 380–401

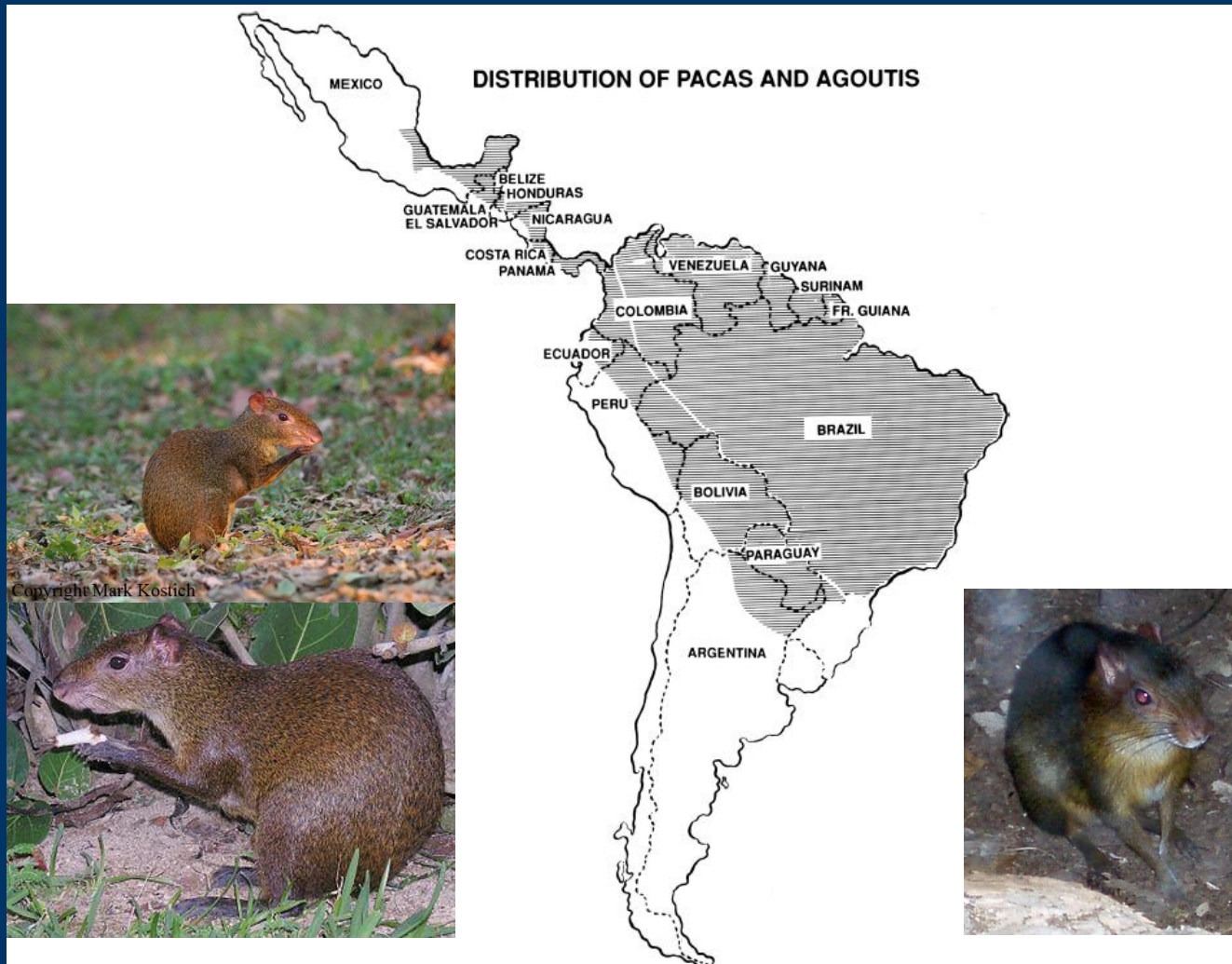


FIG. 26. Map of Central America and South America, showing the geographic ranges of the paca and agoutis. (Reprinted from reference 12 with permission from Elsevier.)

Hidatidosis

Diversidad biológica de *E. granulosus*

TABLE 2. Strains of *E. granulosus*^a

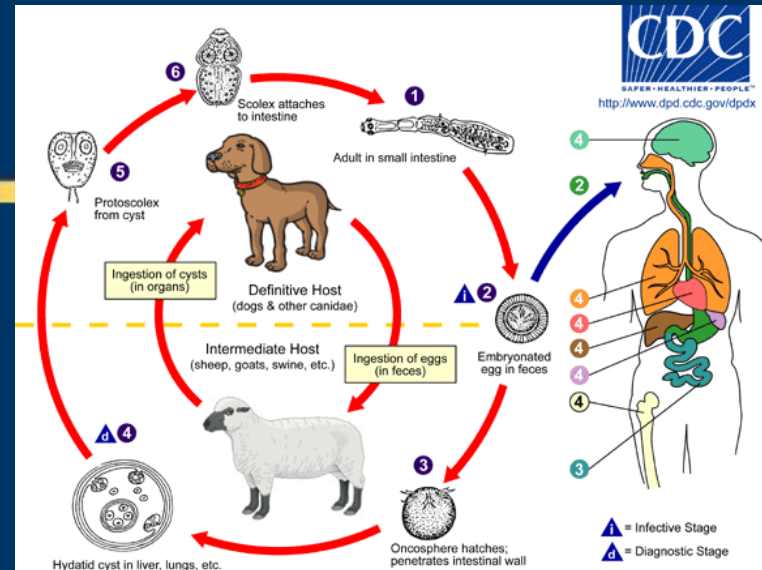
Strain or isolate ^b	Definitive and intermediate hosts ^b	Infectivity for humans	Probable geographic distribution
G1: common sheep strain	D: dog, fox, dingo, jackal, hyena I: sheep, cattle, pig, camel, goat, macropods	Yes	Europe, Middle East, Africa, Iran, India, Nepal, China, Russia, Australian mainland, Tasmania, New Zealand, United States, South America
G2: Tasmanian sheep strain	D: dog, fox I: sheep, cattle?	Yes	Tasmania, Argentina
G3: (buffalo strain)?	D: dog, fox? I: buffalo, cattle?	?	Asia
G4: horse strain ^c	D: dog H: horse, other equines	No/?	Europe, Middle East, South Africa (New Zealand?, United States?)
G5: cattle strain ^d	D: dog I: cattle, buffalo, sheep, goat	Yes	Europe, South Africa, India, Nepal, Sri Lanka, Russia, South America?
G6: camel strain	D: dog	Yes	Middle East, Iran, Africa, China, Nepal, Argentina
G7: pig strain	I: camel, goat, cattle D: dog I: pig	Yes	Poland, Slovakia, Ukraine, Russia, Argentina
G8: cervid strain (G8)	D: wolf, dog I: cervids	Yes	North America, Eurasia
G9: ?	?	Yes	Poland
Lion strain	D: lion I: zebra, wildebeest, warthog, bushpig, buffalo, various antelope species, giraffe?, hippopotamus?	?	Africa

Cestodes

Hidatidosis (CIE-10 B67.0)

- **Transmisión**

- El hospedador definitivo se infecta al consumir vísceras u órganos infectados con los quistes hidatídicos
- El hospedador intermediario se infecta al consumir agua o alimentos contaminados con huevos del parásito que fueron depuestos por el hospedador definitivo
- El humano, especialmente en la niñez, por su estrecho contacto con el perro, se infecta al entrar en contacto e ingestión de agua o alimentos contaminados con huevos del perro infectado
- Aunque infrecuentemente puede ocurrir en receptores de órganos transplantados contaminados

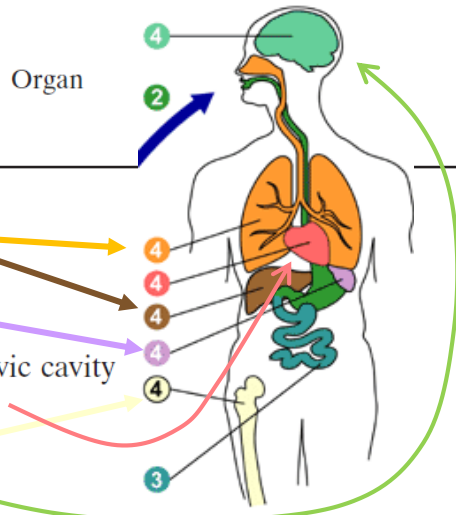


Hidatidosis

Tropismo de *E. granulosus*

CLINICAL MICROBIOLOGY REVIEWS, Jan. 2004, p. 107–135

TABLE 3. Organ sites of *E. granulosus* cysts in humans^a



Study A^b: single-organ involvement in 459 patients

Study B^c: single- and multiple-organ involvement in 15,289 Chinese surgical cases

No. of cases % of cases

No. of cases^d % of cases

Liver

316

68.8

11,499

75.2

Lungs

79

17.2

3,432

22.4

Kidneys

17

3.7

68

0.4

Spleen

15

3.3

160

1.0

Muscles and skin

10

2.2

29

0.2

Abdominal and pelvic cavity

9

2.0

794

5.2

Mediastinum, heart

5

1.1

4

0.03

Brain

4

0.9

61

0.4

Bones

3

0.6

30

0.2

Ovarium

1

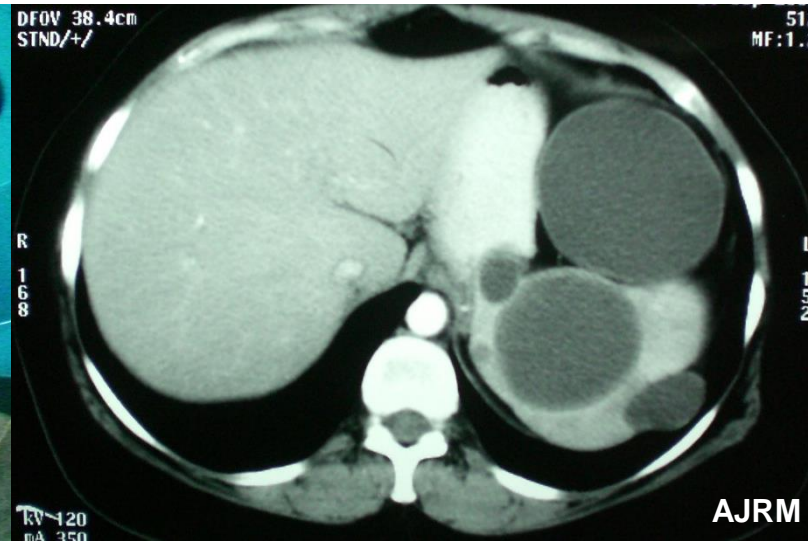
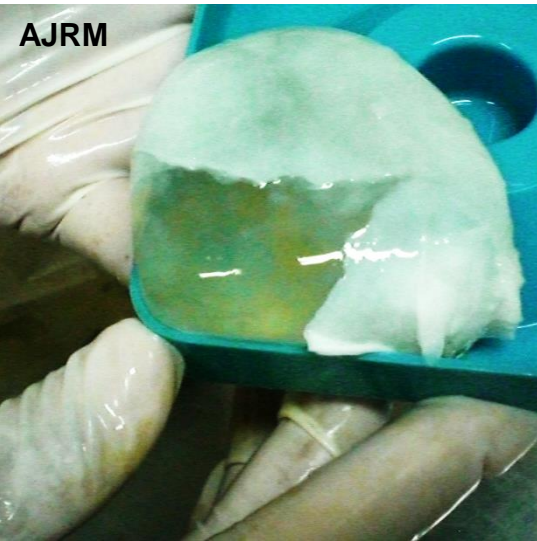
0.2

9

0.06

Other organs: skin, eye, spinal cord, pancreas, urinary bladder, testis, etc.

Each <0.1



AJRM

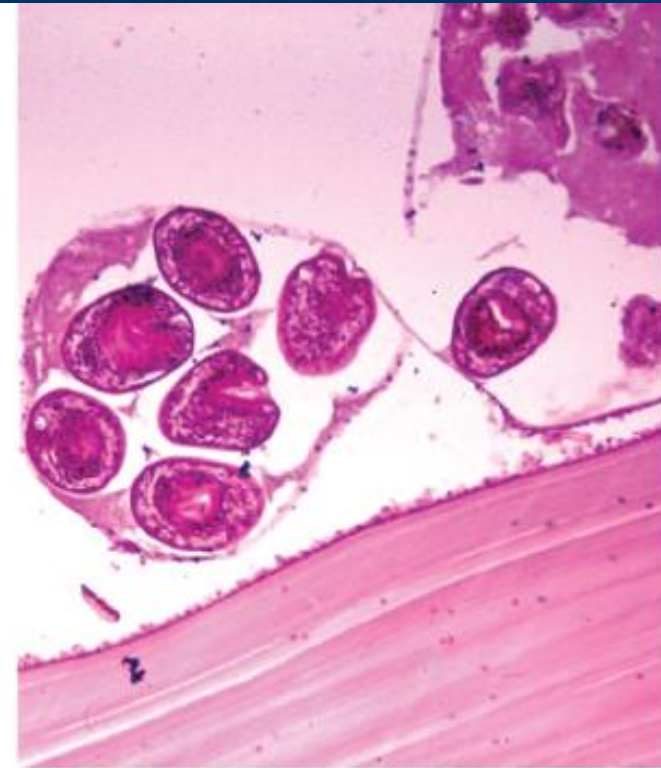
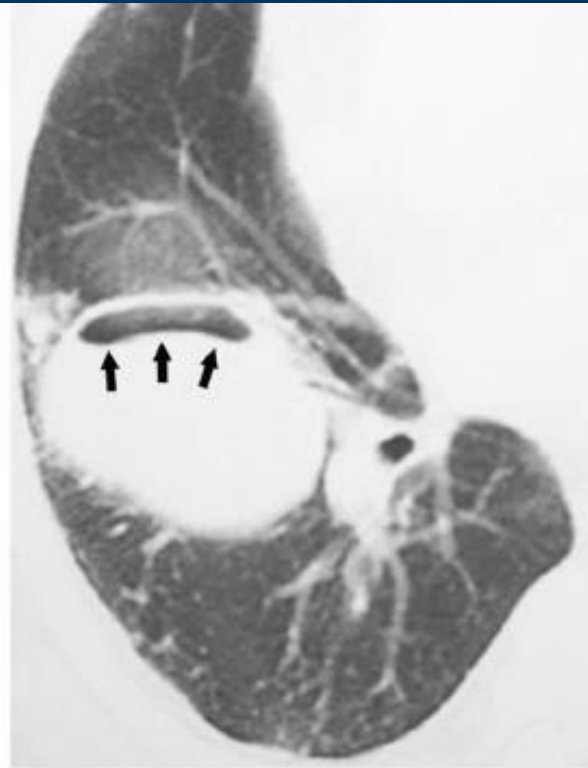
AJRM

AJRM

Hidatidosis

Tropismo de *E. granulosus*

Radiographics. 2005 Jan-Feb;25(1):135-55.



22.

23a.

23b.

Figures 22, 23. (22) Pulmonary hydatid disease from *E granulosus* in a 43-year-old man. Chest radiograph shows a large cyst in the right lower lung. (Courtesy of Ricardo Videla, MD, Hospital Italiano, Rosario, Argentina.) (23) Pulmonary hydatid disease from *E granulosus* in a 32-year-old woman. (a) CT scan of the lung shows a hypoattenuating crescent sign (meniscus sign) (arrows). (b) Photomicrograph (original magnification, $\times 40$; hematoxylin-eosin stain) obtained after surgical resection demonstrates the inner germinal layer, to which several daughter protoscolices of *E granulosus* are attached.

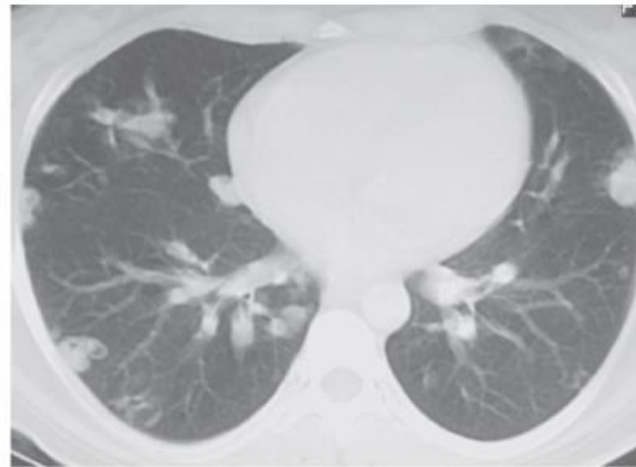
Hidatidosis

Tropismo de *E. vogeli*

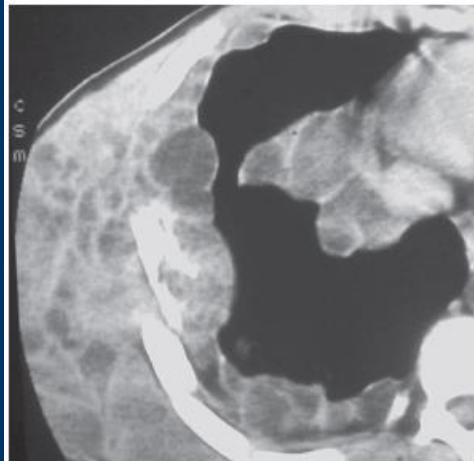
Radiographics. 2005 Jan-Feb;25(1):135-55.



24a.



24b.



25a.



25b.

Figures 24, 25. (24) Polycystic echinococcosis of the lung from *E vogeli* in a 25-year-old man. (a) Chest radiograph demonstrates multiple peripheral round areas of soft-tissue opacity. (b) CT scan shows a clearly defined capsule with a relatively hypoattenuating center, a finding that reflects the cystic nature of the lesions. *E vogeli* was identified at pathologic analysis as the etiologic agent. (25) Polycystic echinococcosis of the chest wall from *E vogeli* in a 13-year-old boy. (a) Chest CT scan shows cystic thickening of the pleura with chest wall involvement. (b) Photograph of the surgically resected gross specimen demonstrates osseous expansion secondary to rib invasion (scale is in centimeters). Histologic analysis revealed *E vogeli*. (Case courtesy of Humberto Varón, MD, Fundación Cardioinfantil, Bogotá, Colombia, and Susana Onatra, MD, Hospital de la Misericordia, Bogotá, Colombia.)

CLINICAL MICROBIOLOGY REVIEWS, Jan. 2004, p. 107–135

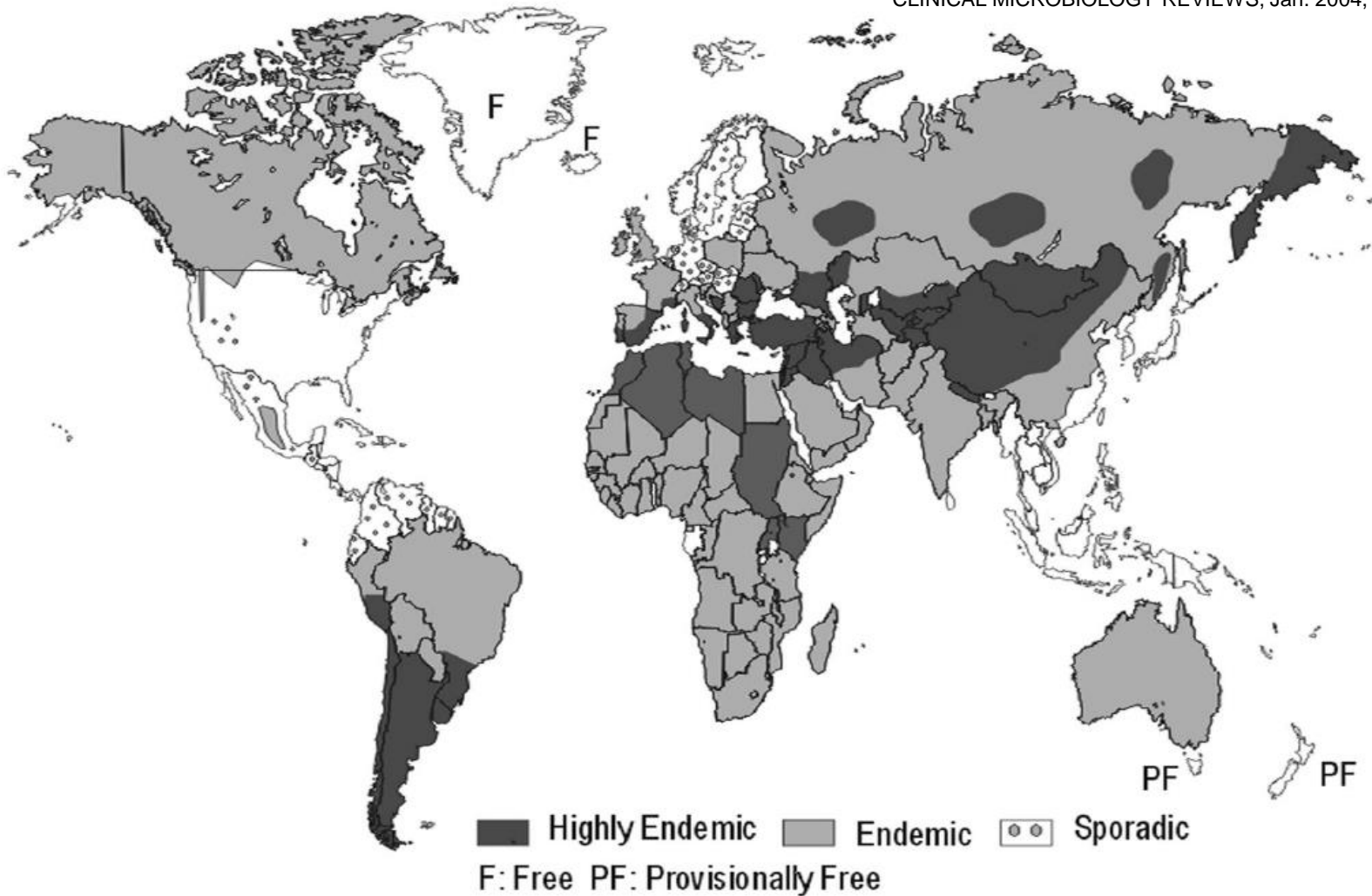


FIG. 5. Approximate global distribution of *E. granulosus* (as of 2002). The exact identification of areas of normal and high endemicity is difficult because of incomplete or lacking data. Modified from WHO/OIE 2001 (223) with permission.

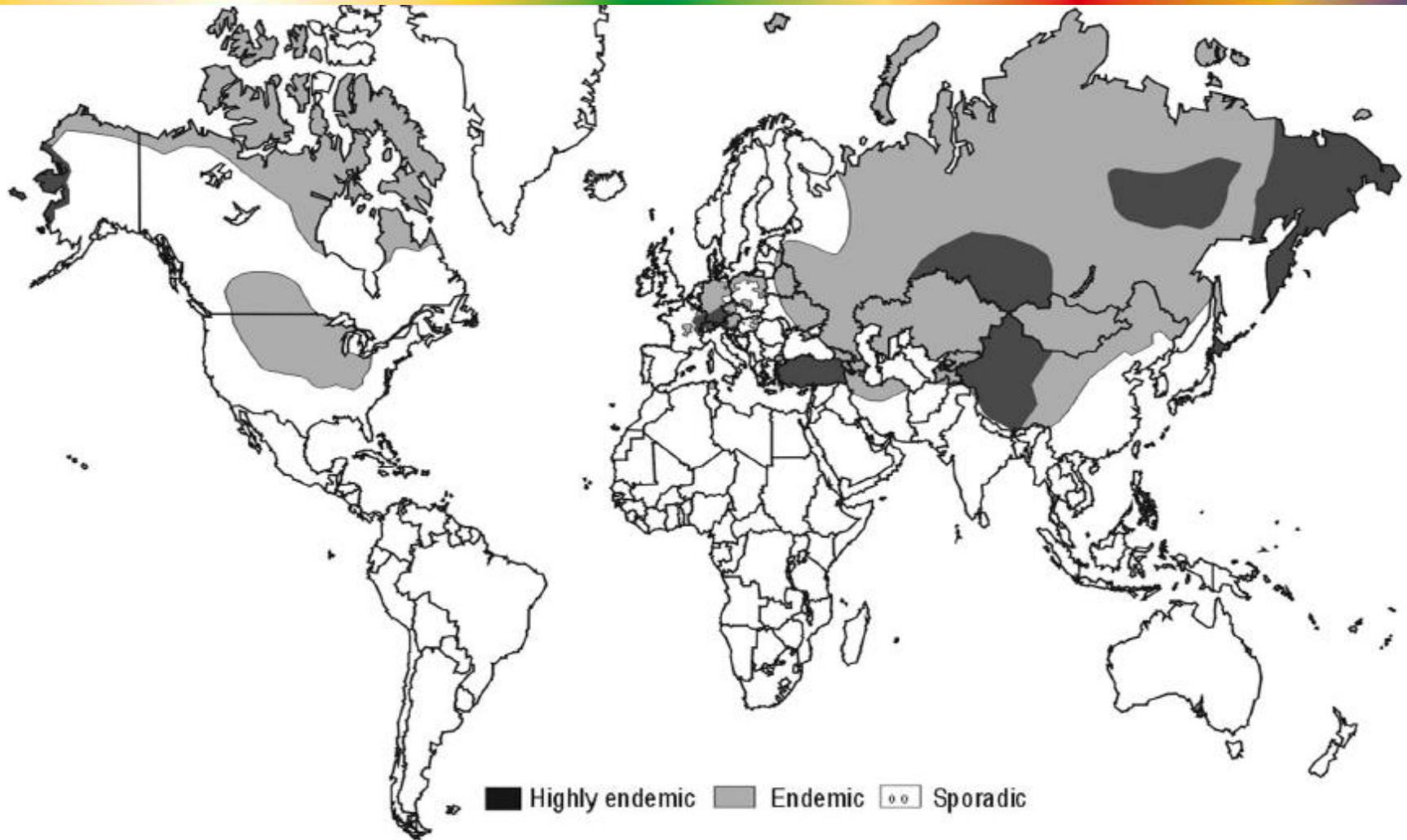
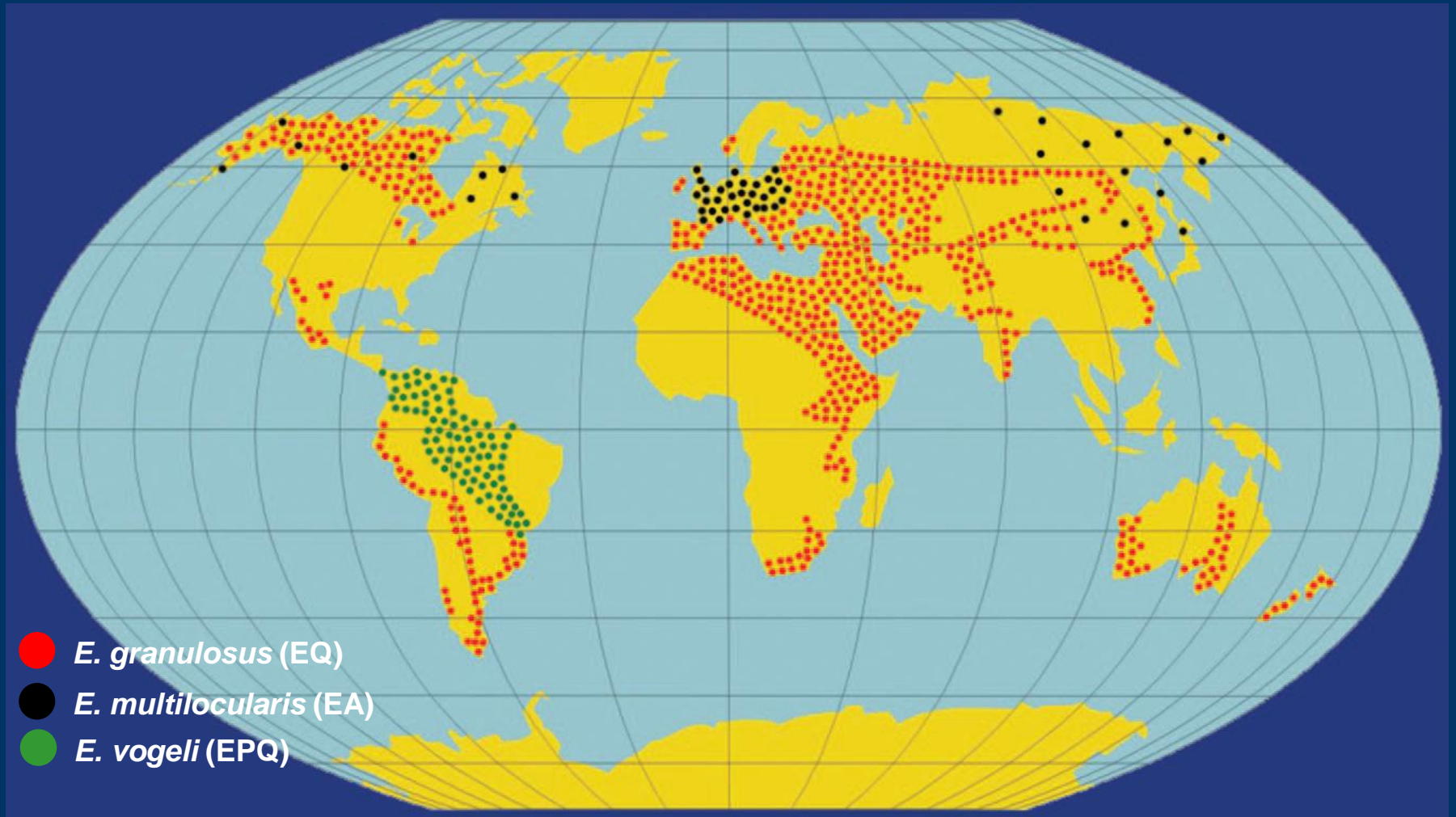


FIG. 9. Approximate global distribution of *E. multilocularis* (as of 2002). Exact identification of areas of normal and high endemicity is difficult because of incomplete or lacking data. Modified from WHO/OIE 2001 (223) with permission.

Otras Hidatidosis

Distribución Global

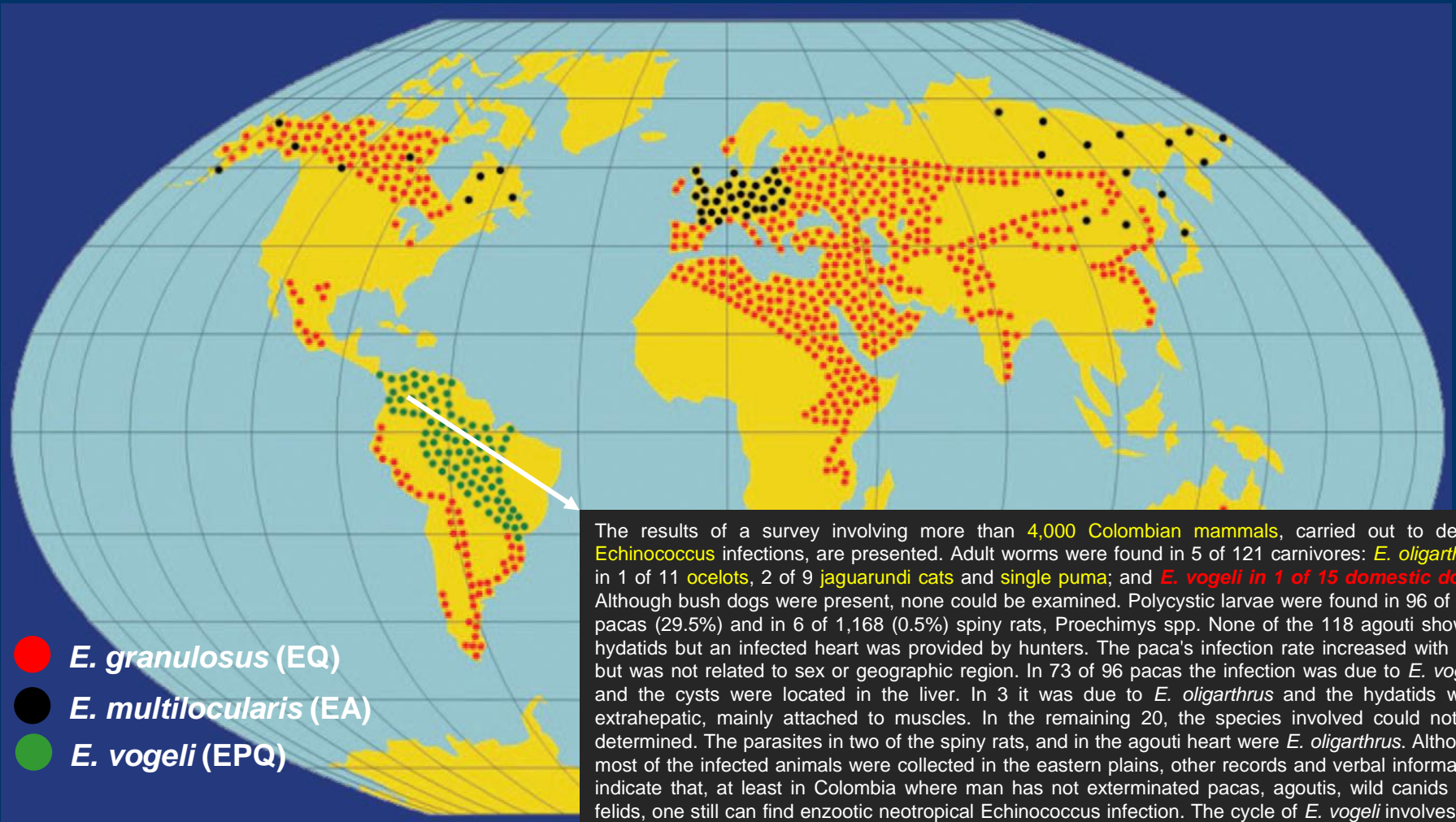
Radiographics. 2005 Jan-Feb;25(1):135-55.



Otras Hidatidosis

Distribución Global

Radiographics. 2005 Jan-Feb;25(1):135-55.



- *E. granulosus* (EQ)
- *E. multilocularis* (EA)
- *E. vogeli* (EPQ)

The results of a survey involving more than 4,000 Colombian mammals, carried out to detect *Echinococcus* infections, are presented. Adult worms were found in 5 of 121 carnivores: *E. oligarthrus* in 1 of 11 ocelots, 2 of 9 jaguarundi cats and single puma; and *E. vogeli* in 1 of 15 domestic dogs. Although bush dogs were present, none could be examined. Polycystic larvae were found in 96 of 325 pacas (29.5%) and in 6 of 1,168 (0.5%) spiny rats, *Proechimys* spp. None of the 118 agouti showed hydatids but an infected heart was provided by hunters. The paca's infection rate increased with age but was not related to sex or geographic region. In 73 of 96 pacas the infection was due to *E. vogeli*, and the cysts were located in the liver. In 3 it was due to *E. oligarthrus* and the hydatids were extrahepatic, mainly attached to muscles. In the remaining 20, the species involved could not be determined. The parasites in two of the spiny rats, and in the agouti heart were *E. oligarthrus*. Although most of the infected animals were collected in the eastern plains, other records and verbal information indicate that, at least in Colombia where man has not exterminated pacas, agoutis, wild canids and felids, one still can find enzootic neotropical *Echinococcus* infection. The cycle of *E. vogeli* involves the bush dog and paca as hosts, and that of *E. oligarthrus*, the paca, agouti, spiny rat, and several species of wild felids. [Am J Trop Med Hyg. 1981 Nov;30(6):1263-76.]

TABLE 4. Number of cases of echinococcosis in the Neotropics by country and species of *Echinococcus*^a

Country	No. of cases with indicated infection				Total
	<i>E. vogeli</i>	<i>E. cf. vogeli</i>	<i>E. oligarthrus</i>	<i>E. granulosus</i>	
Nicaragua		1			1
Costa Rica		1		1	2
Panama	2				2
Colombia	15	14			29
Ecuador	6	5			11
Venezuela	2	1	1		4
Peru	1				1
Brazil	21	77	1		99
Suriname	7	1	1		9
Uruguay		2			2
Argentina ^b		11			11
Chile		1			1
Total	54	114	3	1	172

Images in Clinical Tropical Medicine

Cardiac Echinococcosis, an Unusual Echocardiographic Finding

Juan Cataño*

Facultad de Medicina, Universidad de Antioquia, Medellín, Colombia

Cardiac echinococcosis is an unusual echocardiographic finding.¹ An 18-year-old woman from Colombia, who had lived her entire life on a farm and had no remarkable medical history, was admitted to a hospital because of three weeks of non-specific upper abdominal pain and intermittent jaundice. There was no fever, chest pain, palpitation, dysnea, or other cardiac symptoms. Results of a heart examination were normal. Her laboratory data, including blood chemistries, electrocardiogram, and chest radiograph, were normal. Transesophageal echocardiography² was performed because chest computed tomography showed an atrial mass, a 4 × 3 cm cyst with multiple and mobile small internal structures, in the right atrium. This finding was consistent with a cardiac hydatid cyst (Figure 1). Serologic analysis confirmed the diagnosis. Treatment with albendazole, 200 mg every 12 hours, was started, and 1 day before scheduled surgery she had fever. Cardiac complications were suspected because of the presence of the cyst. Therefore, another transesophageal echocardiogram was performed and showed a right atrial cyst without multiple internal mobile small kidney-shaped cystic lesions, which suggested cyst rupture with multiple cyst embolisms (Figure 2). Surgery was canceled and the patient responded well to albendazole treatment alone without recurrence of symptoms.



FIGURE 1. Initial manifestations of the patient with transesophageal echocardiography, showing a 4 × 3 cm cyst with multiple internal structures.

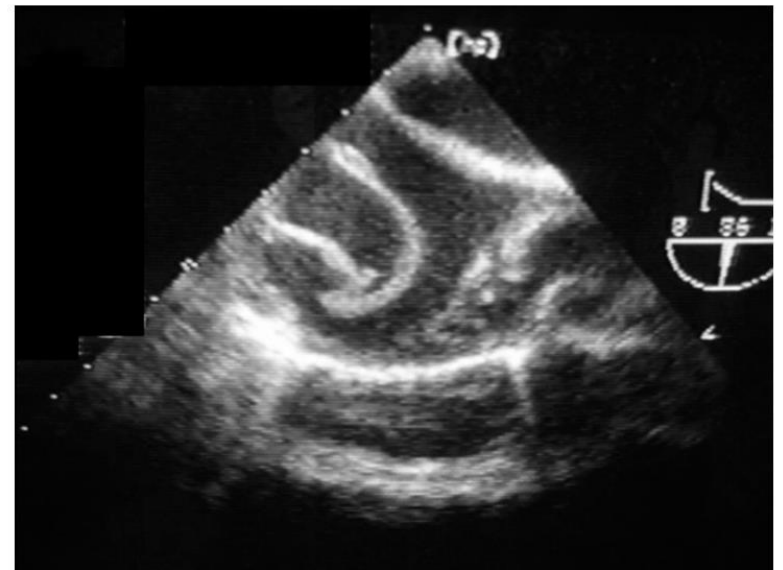


FIGURE 2. Second transesophageal echocardiography performed on the patient after abrupt onset of chest pain and fever, showing the cyst wall without the multiple, internal, small, kidney-shaped cystic lesions consistent with spontaneous cyst rupture.

Sistema de Información y Vigilancia
Epidemiológica

COLOMBIA,
SANIDAD ANIMAL 2008

SITUACIÓN EPIDEMIOLÓGICA EN COLOMBIA RESPECTO DE LAS ENFERMEDADES

1. *ENFERMEDADES QUE NUNCA SE HAN REGISTRADO*

1.1 ENFERMEDADES COMUNES A VARIAS ESPECIES

- Equinococosis / hidatidosis
- Cowdriosis (Heartwater)

1.2 ENFERMEDADES DE LOS BOVINOS

- Theileriosis
- Encefalopatía espongiforme bovina

1.4 ENFERMEDADES DE LOS EQUINOS

- Metritis contagiosa equina
- Durina
- Linfangitis epizoótica
- Muermo
- Viruela equina
- Arteritis viral equina
- Encefalitis japonesa

1.5 ENFERMEDADES DE LOS PORCINOS

- Triquinelosis

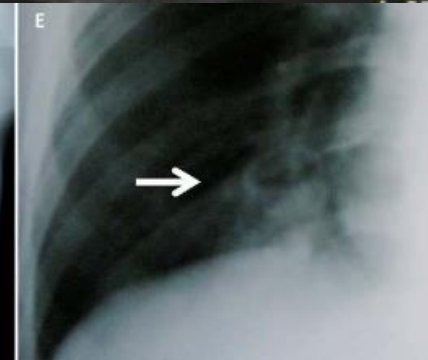
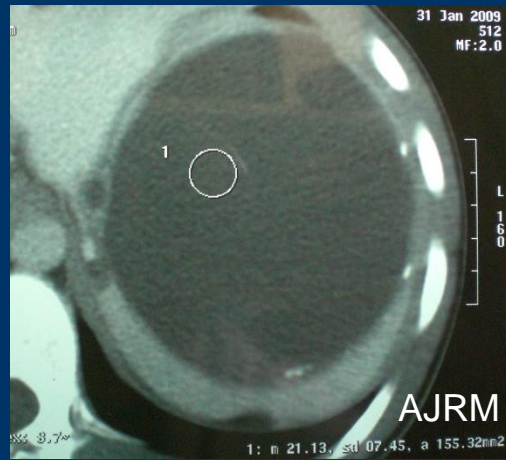
1.6 ENFERMEDADES DE LAS AVES

Cestodes

Hidatidosis (CIE-10 B67.0)

• Patología

- El daño producido por el quiste hidatídico es sobre todo mecánico, puede interferir con la función del órgano.
- El quiste unilocular es benigno, pero al crecer se puede romper y causar una reacción anafiláctica.
- El quiste óseo erosiona la estructura medular del hueso, causando múltiples fracturas
- El líquido contenido dentro del quiste si se rompe puede producir serias reacciones alérgicas o anafilácticas.



PLoS Negl Trop Dis. 2012 April; 6(4): e1462.

Figure 2: T2-weighted MRI views showing the bony involvement and the soft tissue extent.

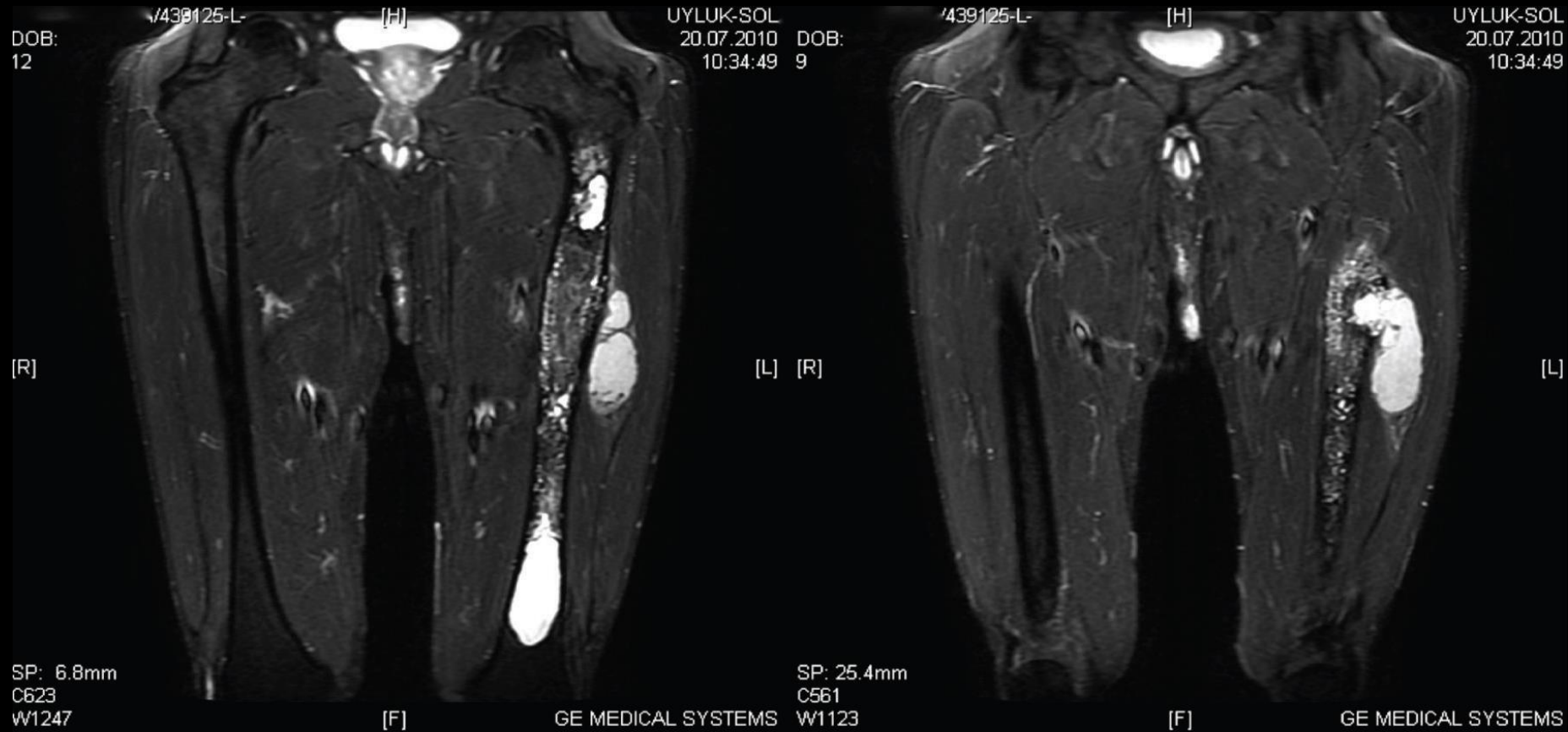


Figure 2: T2-weighted MRI views showing the bony involvement and the soft tissue extent.

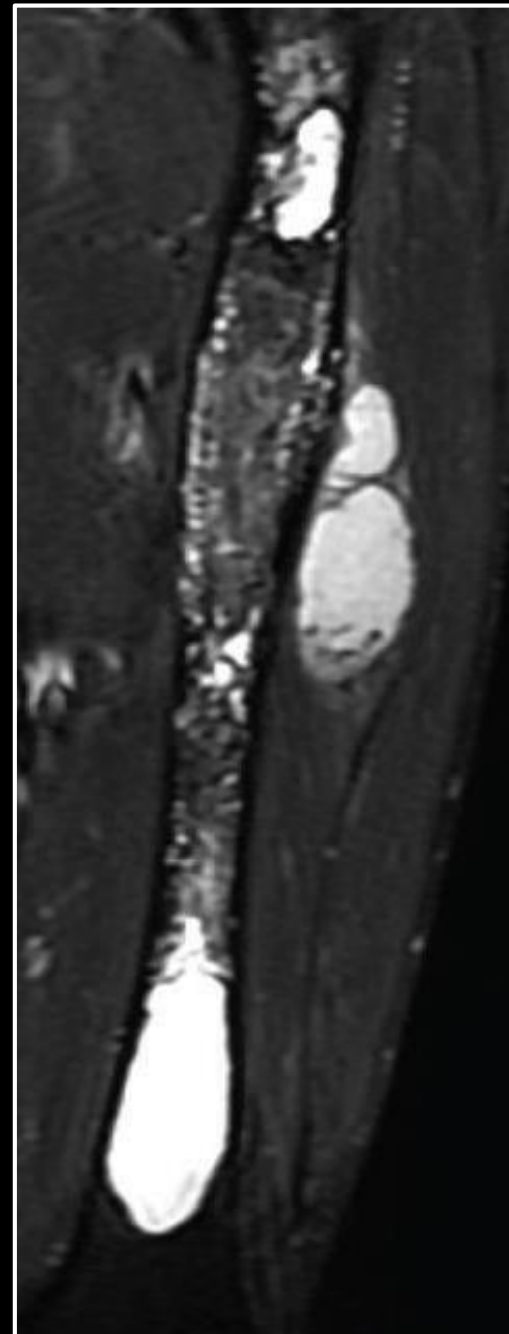


Figure 3: Lamellar cuticular membrane with giant cell and histiocytic reaction seen between the fibrovascular tissues in pathological specimen.

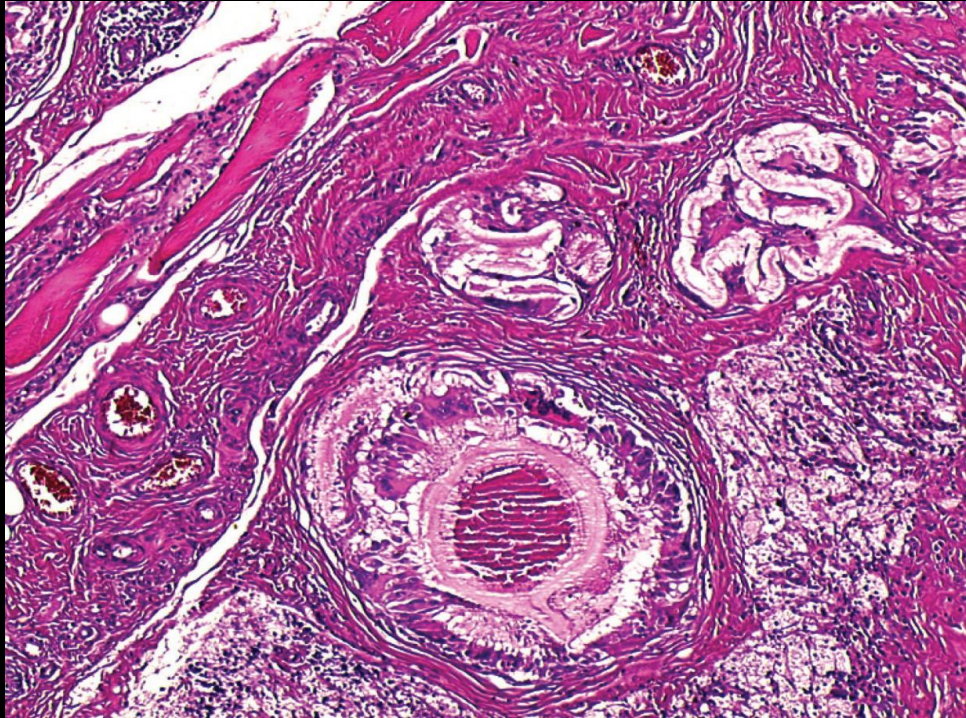


Figure 5: Medullary cavity of the femur filled with custom-made vancomycin beads.



Cestodes

Hidatidosis (CIE-10 B67.0)

• Patología

- Ocasionalmente produce abscesos bronquiales o biliares y causar la muerte o producir embolia arterial por acumulación de fragmentos capsulares o su diseminación a través de la circulación como metástasis a otras partes del cuerpo y producir distorsión de la caja torácica.
- Puede producirse grave obstrucción en capilares cerebrales, órbitas oculares o válvulas cardíacas.
- Es una enfermedad grave, destructora por el crecimiento del quiste sobre el tejido por la acción mecánica.

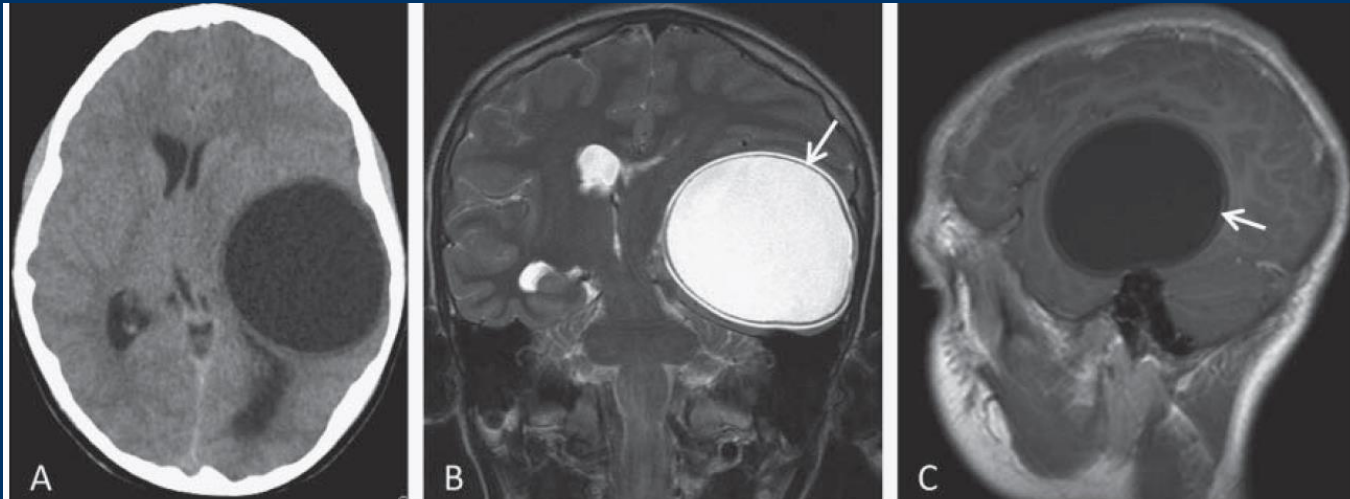


Figura 1. TC axial sin contraste (A). RM T2WI coronal (B). RM T1WI sagital con gadolinio (C). Formación quística intraaxial temporal izquierda, bien delimitada y de contenido homogéneo isodenso (A) e isointenso (B, C) respecto al LCR. Significativo efecto de masa con hidrocefalia secundaria (A). Membrana germinal (B y C, flecha) separada del resto del quiste y que presenta una discreta captación de contraste (C).

Cestodes

Hidatidosis (CIE-10 B67.0)

- Manifestaciones clínicas

- Son dependientes de los órganos afectados
- La enfermedad tiene características de un tumor en crecimiento. El desarrollo exagerado del quiste larvario produce presión sobre los órganos causando dolor, obstrucción y erosión de vasos sanguíneos y conductos que llevan a una atrofia, hemorragias y necrosis de los tejidos con alteración profunda de la función.
- Puede ser asintomática
- La sintomatología no es típica y depende del órgano que afecte y del estado de evolución. Los quistes sólo producen sintomatología después de varios años de haberse adquirido la infección.
- Signos y síntomas generales son fiebre, pérdida de peso, astenia, anemia, leucocitosis, hipereosinofilia, se agrega la presión mecánica que hace el quiste y las Reacciones inmunológicas si se rompe.

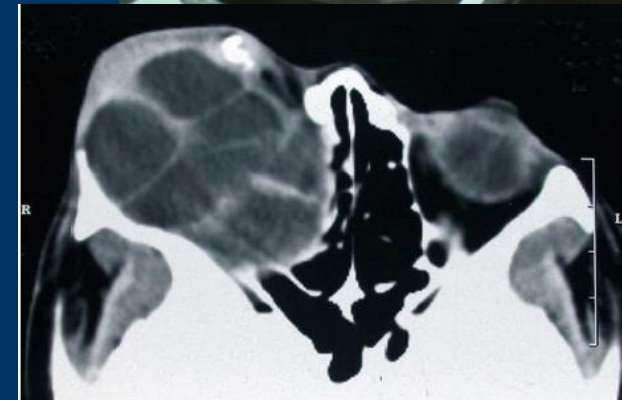


FIGURE 1. Polycystic echinococcosis in a 14-year-old girl: (Top) Axial computed tomography scan shows closely packed multiple cysts with bony effacement and phthisis bulbi with calcification. (Bottom) Multiple white translucent cysts that have been freshly extracted from the orbit are shown.

Cestodes

Hidatidosis (CIE-10 B67.0)

• Manifestaciones clínicas

- En hígado (60%): Se puede presentar la forma Quística, Alveolar o Poliquística, se acompaña de: dolor tipo cólico irradiado al hombro derecho, masas palpables, intolerancia a alimentos grasos. Ocurre ruptura del diafragma o cavidad peritoneal, urticaria, ictericia obstructiva e hipertensión portal y frémito.
- En pulmones (20%): Se puede presentar la forma Quística, Alveolar o Poliquística, el quiste es único y prefiere los lóbulos inferiores, síntomas: dolores vagos, tos, expectoración, disnea, hemoptisis, abscesos pulmonares, fístulas broncopleurales, atelectasia, (falta de dilatación o expansión pulmonar) hipertensión pulmonar.
- Conductos biliares: causa obstrucción e ictericia.
- Ruptura de la hidátide en conductos biliares, cavidad peritoneal, pulmón, pleura, bronquios, causa fiebre, prurito, urticaria y Rx. anafiláctica.
- Huesos: quistes semisólidos invaden la cavidad medular y erosionan el hueso y lo fracturan: vértebras y pelvis

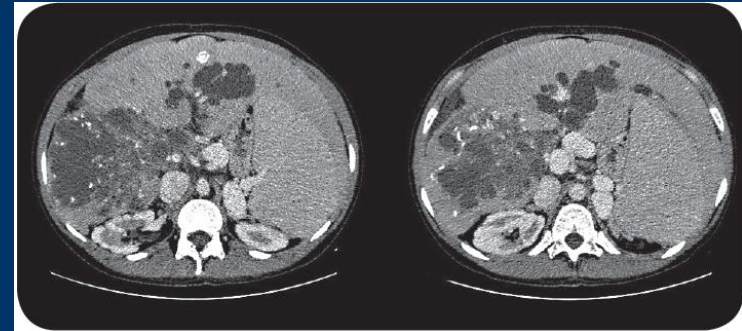


FIGURE 1 - Abdominal computed tomography scan showing multiple diffuse cysts in the liver with peripheral calcifications, affecting the hepatic hilum and both hepatic lobes.

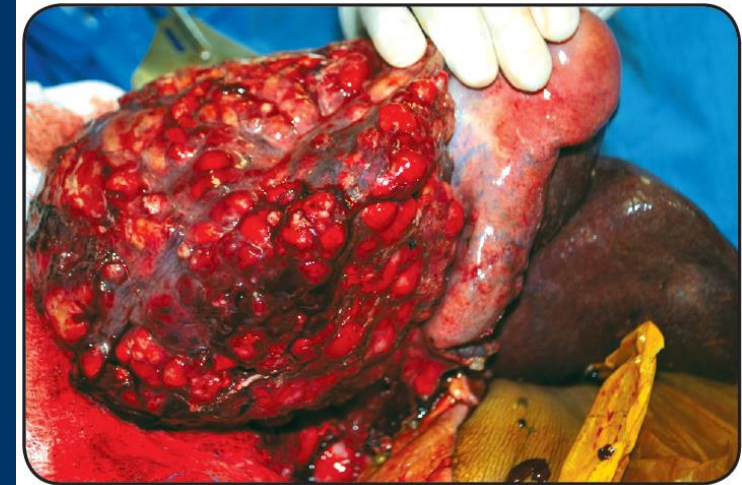


FIGURE 2 - Intraoperative view of the liver showing multiple cysts, occupying the right and left hepatic lobes and the hepatic hilum.

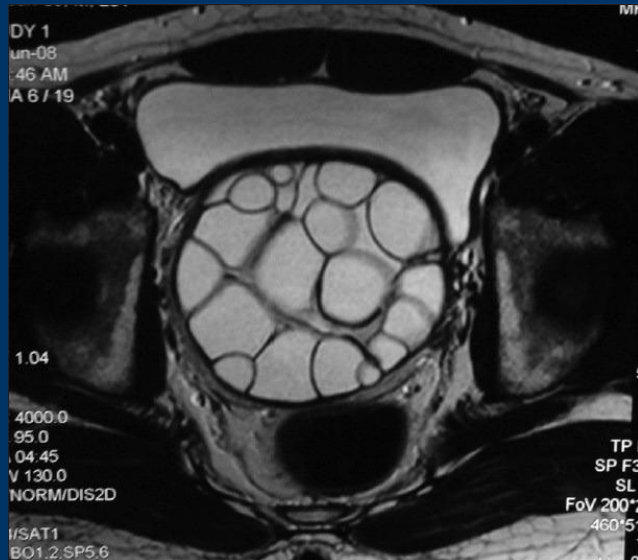
Cestodes

Hidatidosis (CIE-10 B67.0)

• Manifestaciones clínicas

- En sistema nervioso central puede producir epilepsia y ceguera. Puede comprometer riñones, bazo, peritoneo, músculo, corazón, T. Subcutáneo
- Quiste cardíaco: conduce a bloqueos, pericarditis, ruptura ventriculares.
- Antígeno hidatídico: vistos por Anticuerpos fluorescentes en glomérulo han sido relacionados con G.N.M.

Urol Ann. 2012 May-Aug; 4(2): 122–125.



Axial T2WI Magnetic resonance imaging (MRI) showing hyper intense, multicystic lesion about 9 × 8 × 7 cm in size, with multiple daughter cysts in relation to the right seminal vesicle

Embolization of Ruptured Hepatic Hydatid Cyst to Pulmonary Artery in an Elderly Patient



Figure 1: Multidetector computed tomography scan showing irregular, defined patchy lesions (black arrow in right, white arrows in left) in bilateral lung paranchima, especially in the left on lung window.



Figure 2: Multidetector computed tomography angiography shows hypodense masses located in the left main pulmonary artery (white arrow) and in the left distal pulmonary artery to the segmentary branches of the upper lobe.

Hidatidosis

Diagnóstico de *E. granulosus* en animales

TABLE 5. Options for the diagnosis of *E. granulosus* in animals

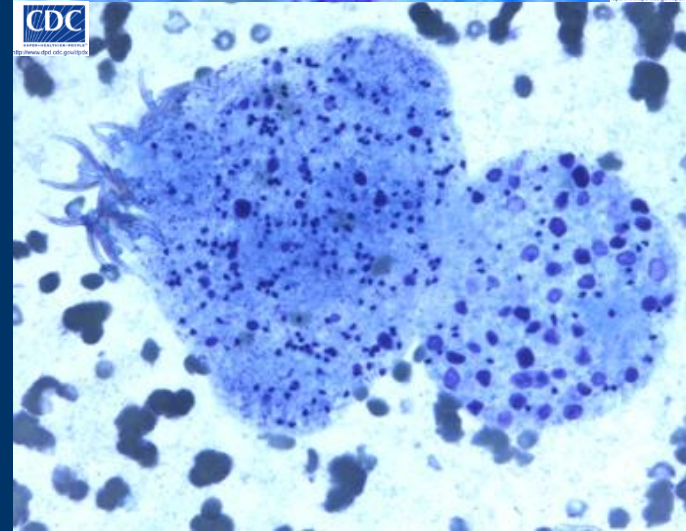
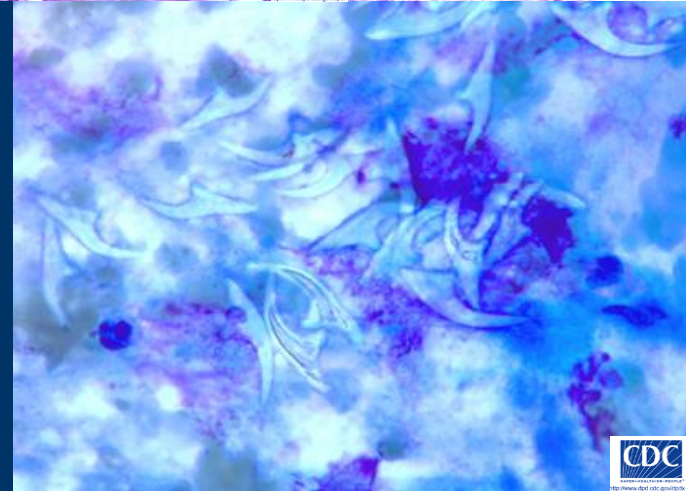
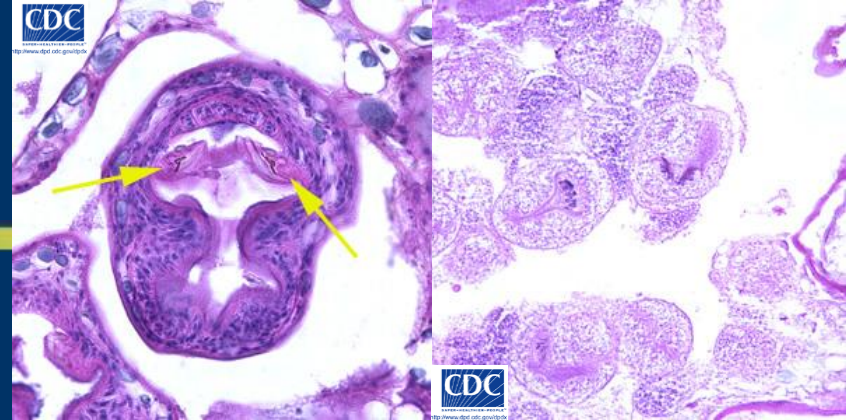
Animal group	Material required	Test, sensitivity and specificity ^a	Reference(s)
Live animals			
Individual dogs	Feces in buffer	Screening: coproantigen ELISA. S, 65–77%; SP, >90%. Secondary ^b : copro-PCR. S, under evaluation; SP, close to 100%.	28, 40 Mathis and Deplazes, unpublished
Dog populations	Fecal material discharged by dogs after arecoline treatment	Standard option: macroscopic examination of discharged material. S, 65% after single-dose arecoline, 78% after second dose; SP, close to 100%.	179
	Feces in buffer	New option. Screening: Coproantigen-ELISA. S and SP, as for individual dogs. Secondary: copro-PCR. S and SP as for individual dogs.	28, 40 Mathis and Deplazes, unpublished
Intermediate hosts: sheep, goat, cattle, horse etc.		No reliable in vivo method for detecting the infection in individual animals, except rare cases in which cysts can be identified by ultrasonography in conjunction with antibody detection, for example in individual horses.	54
		A new ELISA might be useful for the detection of <i>E. granulosus</i> in sheep flocks (sensitivity, 50–60%).	120
Dead animals			
Dogs and other carnivores	Small intestine	Standard option: Parasite detection at necropsy by direct examination of the intestine or by sedimentation technique (S and SP, close to 100%).	54
	Feces from rectum or content from intestine in buffer	New option: coproantigen ELISA in conjunction with copro-PCR (details as for small intestine).	
Intermediate hosts	Viscera	Cyst detection at meat inspection or necropsy; in doubtful cases histology and/or PCR.	54

Cestodes

Hidatidosis (CIE-10 B67.0)

- **Diagnóstico en Seres Humanos**

- Epidemiología, hábitos psicobiológicos
- Consumo de alimentos crudos
- Presencia peridomiciliar de animales relacionados
- Manifestaciones clínicas
- Hallazgos imagenológicos, radiografías, ultrasonidos, tomografías, gammagrafía y resonancias con presencia de quistes
- Diagnóstico serológico
 - Reacción de inmunoprecipitación, doble inmunodifusión en gel, Inmunoelectroforesis: se visualiza la presencia del Arco 5 de gran valor, Técnicas de aglutinación: Hemaglutinación
 - ELISA, Westernblot, PCR (costo y disponibilidad)
 - Intradermoreacción de Cassoni: se usa líquido hidatídico estéril, se introduce intradérmicamente, considerando positivo para la enfermedad cuando después de 12-20 minutos aparece halo eritematoso.
- Diagnóstico anatomopatológico
 - Biopsia, especialmente post-quirúrgica
 - Hallazgo del quiste hidatídico
 - Aspirado de tejido hepático guiado por ultrasonido (riesgoso) →
 - Necropsia, diagnóstico post-mortem
 - Hallazgo del quiste hidatídico



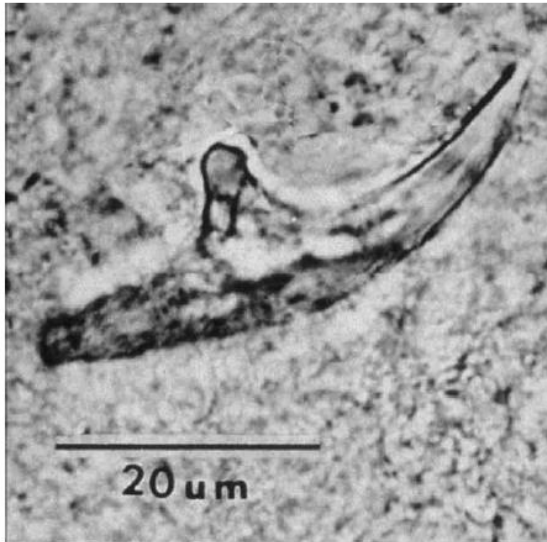
Hidatidosis

Inmunodiagnóstico de hidatidosis o equinococosis quística (CE) y alveolar (AE)

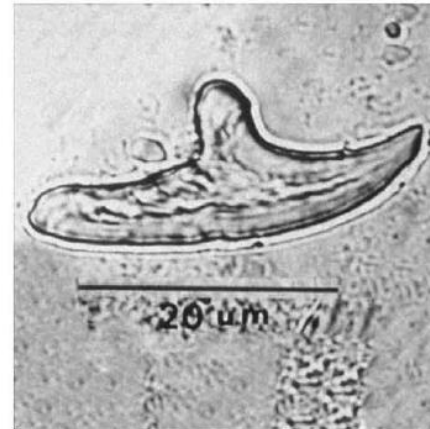
TABLE 4. Tests for antibody detection in human CE and AE^a

Echinococcosis form and test	Antigen ^b	Sensitivity (%)	Relative specificity ^c (%)	Cross-reactions	
Cystic	IgG ELISA	Crude EgCF	80->99	61.7	Cestodes (89%), trematodes (30%), nematodes (39%)
		Antigen B (native or synthetic peptide)	63-92	85-93	AE
	IgG4 ELISA EITB ^d	Crude EgCF	61-67	>99	AE only (see AE)
		Crude EgCF	71	>98 ^e	<i>T. solium</i> cysticercosis only
		Antigen B fraction	92	100	None
		Antigen B subunits	34-36	>90	
Alveolar	IgG ELISA	Crude EgCF	97.1	61.7	See above
		Em2PLUS	97.1	98.9	CE (25%)
		Em2/Em2G11	89.3	100	CE (5.6%)
		Em II/3-10	86.4	98.4	CE (6.5%)
		Crude EgCF	48-67	>99	CE (see CE)
	IgG4 ELISA EITB	Em18	97	100	None
		Glycoproteins	70-90	>95	

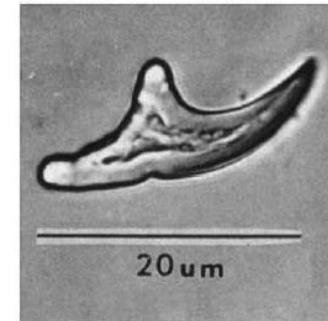
Los ganchos de *Echinococcus* spp.



E. vogeli



E. oligarthrus

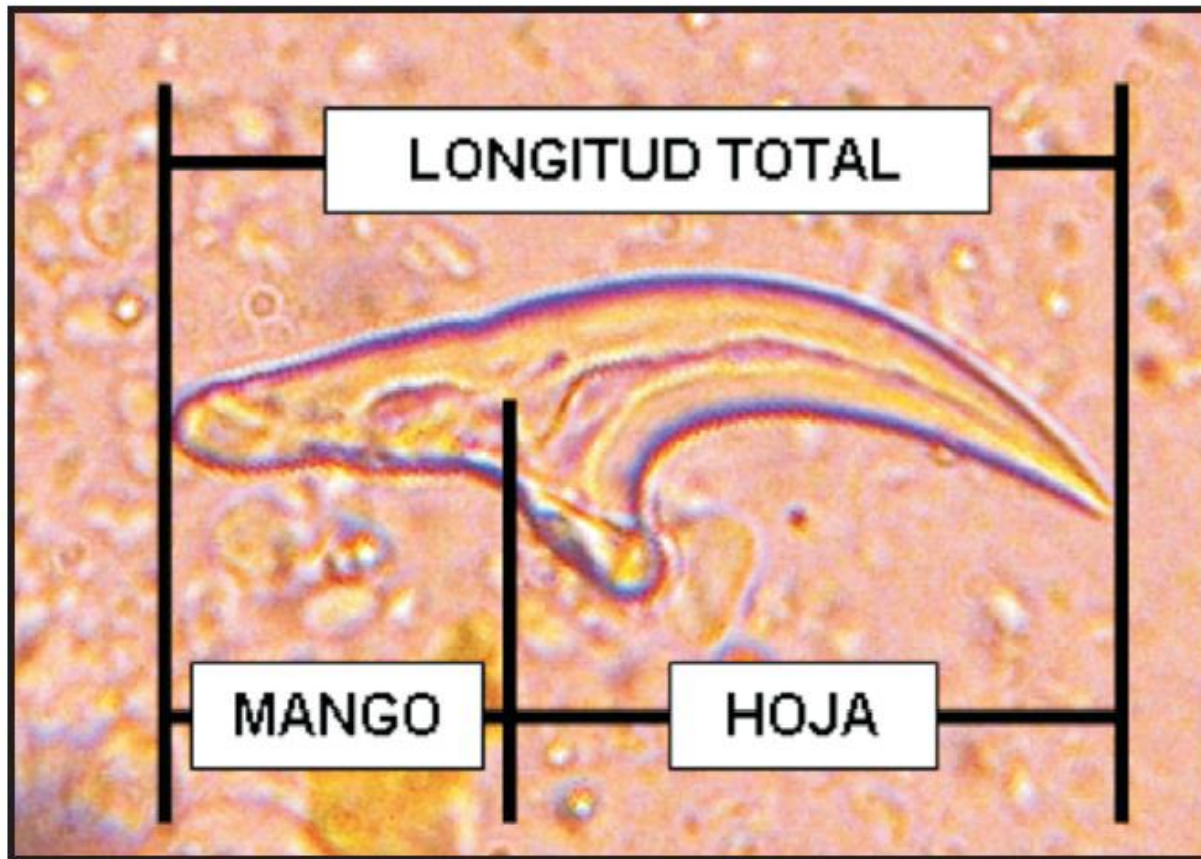


E. granulosus

FIG. 23. Large rostellar hooks from protoscoleces of *Echinococcus vogeli*, *E. oligarthrus*, and *E. granulosus* (left to right, all at the same magnification).

Los ganchos de *Echinococcus spp.*

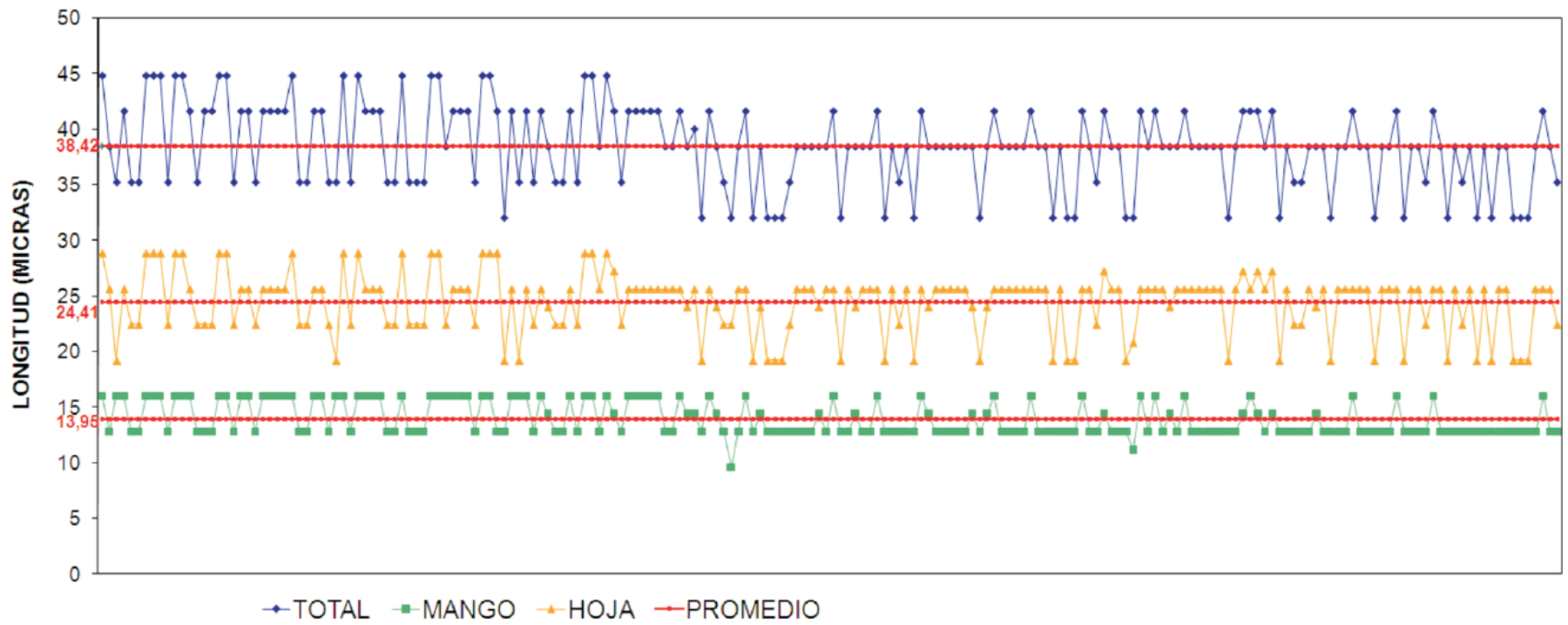
Fig. 2. Microfotografía (40x) de gancho rostral observado en el líquido hidatídico del caso clínico 1. Se identifican los segmentos de medición.



Los ganchos de *Echinococcus spp.*

Hidatidosis humana en el Amazonas venezolano

Fig. 3. Mediciones total y promedio por segmentos de 200 ganchos de *Echinococcus vogeli* observados en el líquido hidatídico del caso clínico 2.

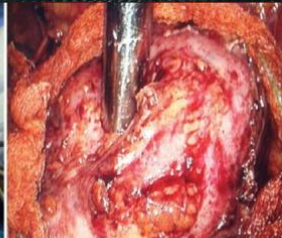
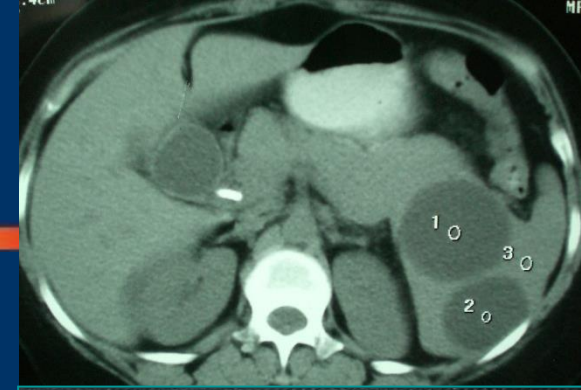


Cestodes

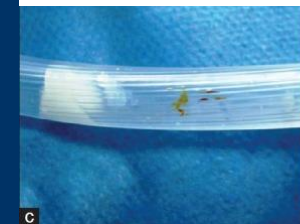
Hidatidosis (CIE-10 B67.0)

• Manejo Terapéutico

- Multidisciplinario, médico y quirúrgico
- Tradicionalmente, la hidatidosis se ha considerado un estado patológico de resolución esencialmente quirúrgica.
- Procedimientos quirúrgicos, exéresis de los quistes, cuidando extraer el quiste completo, evitando que se rompa
- Es fundamental recalcar la importancia de la terapia individual para cada paciente y para cada quiste en particular.
- Para alcanzar este objetivo, en primer lugar tenemos que identificar cada quiste, poniendo énfasis en su morfología, ubicación y tamaño, para que, a continuación se utilice una clasificación común, basada en los hallazgos ultrasonográficos que nos permita unificar el diagnóstico y el tratamiento.
- El abordaje se basa en la estadificación de la OMS (WHO Informal Working Group. International classification of ultrasound images in cystic echinococcosis for application in clinical and field epidemiological settings. Acta Tropica 2003; 85: 253-261.)



Total Laparoscopic Management of a Large Renal Hydatid Cyst by Using Hydatid Trocar Cannula System



Cestodes

Hidatidosis (CIE-10 B67.0)

- **Manejo Terapéutico**
 - Uso de antiparasitarios: mebendazol a altas dosis
- **Control sanitario**
 - Educación sanitaria, promoción y prevención
 - Personal en riesgo, personas que manipulan carnes, mataderos
 - Sacrificio de ganado vacuno infectado
 - Control de perros infectados
 - Prevenir la deposición indiscriminada de heces de perros en áreas visitadas por niños, especialmente aquellas de juego



Cestodes

Hidatidosis (CIE-10 B67.0) – Clasificación de la OMS/IWG (2003)

CLASIFICACIÓN WHO/IWG (2003)

CL	Lesión quística unilocular sin pared visible
CE1	Lesión unilocular con pared quística visible, arenilla hidatídica y signo de copo de nieve (Figura1)
CE2	Lesión multivesicular, multiseptada, signo del panal de abejas y vesículas hijas visibles
CE3	Lesión unilocular, desprendimiento de la membrana laminar dentro del quiste, signo del camalote (Figura 2)
CE4	Lesión heterogénea hipo o hiperecogénica, sin vesículas hijas, con contenido degenerativo
CE5	Calcificación de la pared quística, total o parcial (Figura 3)

Adaptada de WHO Informal Working Group: Acta Tropica 2003; 85: 253.


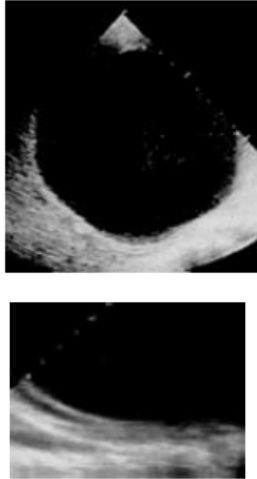
Image	Imaging features and remarks
<p data-bbox="185 154 239 182">CL</p> 	<ul style="list-style-type: none"> • Status: If CE: active. • Unilocular, cystic lesion (s) (CL) with uniform anechoic content, not clearly delimited by an hyperechoic rim (= cyst wall not visible). • Normally round but may be oval. • Size variable: often small: CLs (< 5.0 cm), but may be medium sized : CLm (5–10 cm), or large : CLl (> 10cm) <p>Remarks:</p> <p>Normally these are non-parasitic cystic lesions, but in the suspicion of CE these cysts are usually at an early stage of development and are not fertile. US does not detect any pathognomonic signs. Differential diagnosis of these cystic lesions requires the application of additional diagnostic techniques.</p>
<p data-bbox="185 753 349 782">Type CE1</p> 	<ul style="list-style-type: none"> • Status: active • Unilocular, simple cyst with uniform anechoic content. Cyst may exhibit fine Echoes due to shifting of brood capsules which is often called hydatid sand ("snow flake sign"). • Cyst wall is visible. • Normally round or oval. • Size variable: CE1s (< 5.0 cm), CE1m (5 – 10 cm), CE1l (> 10cm) <p>Remarks:</p> <p>Usually fertile.</p> <p>Pathognomonic signs include visible cyst wall and snow flake sign.</p>




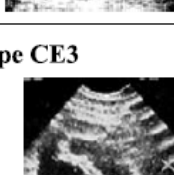


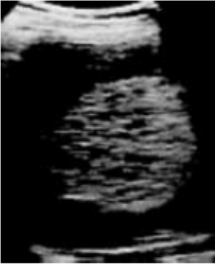

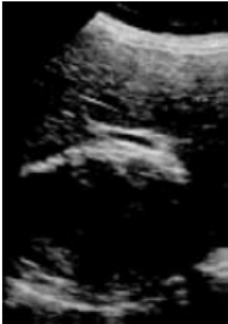
Image	Imaging features and remarks
<p>Type CE2</p>  <p>a) </p> <p>b) </p> <p>c) </p>	<ul style="list-style-type: none"> • Status: active • Multivesicular, multiseptated cysts in which the daughter cysts may partly (plate 2a) or completely fill the unilocular mother cyst. Cyst septations may produce “wheel-like“ structures (plate 2b), or the contained daughter cysts may produce a “rosette-like“ or “honeycomb-like“ structure (plate 2c). • Cyst wall normally visible. • Normally round or oval. • Size variable: CE2s (< 5.0 cm), CE2m (5 – 10 cm), CE2l (> 10cm) <p>Remarks: Usually fertile. US features are pathognomonic.</p>
<p>Type CE3</p> <p>a) </p> <p>b) </p>	<ul style="list-style-type: none"> • Status: transitional • Anechoic content with detachment of laminated membrane from the cyst wall visible as floating membrane or as “water-lily sign“ which is indicative of wavy membranes floating on top of remaining cyst fluid (plate 3a). • Unilocular cyst which may contain daughter cysts (anechoic appearance) and echoic areas (disrupted membranes\degenerating daughter cysts). These cysts appear at US as a “complex mass” (plate 3b) • Cyst form may be less rounded due to decrease of intra-cystic fluid pressure. • Size variable: CE3s (< 5.0 cm), CE3m (5 – 10 cm), CE3l (> 10cm) <p>Remarks: Transitional stage. Cyst is most usually starting to degenerate. Degenerative signs on US examination are “detachment and rupture of membranes”. Occasionally may be followed by daughter cyst production. US features are pathognomonic.</p>

Image	Imaging features and remarks
<p data-bbox="224 137 382 168">Type CE4</p> <div data-bbox="301 182 517 444">  </div> <p data-bbox="224 451 258 482">a)</p> <div data-bbox="291 465 513 751">  </div> <p data-bbox="224 758 258 789">b)</p>	<ul data-bbox="585 137 1690 436" style="list-style-type: none"> • Status: inactive • Heterogenous hypoechoic or dyshomogeneous degenerative contents. No daughter cysts (plate 4a). • May show a “ball of wool“ sign which is indicative of degenerating membranes (plate 4b). • Size variable: CE4s (< 5.0 cm), CE4m (5 – 10 cm), CE4l (> 10cm) <p data-bbox="585 458 736 489">Remarks:</p> <p data-bbox="585 515 1122 546">Most cysts of this type are not fertile.</p> <p data-bbox="585 572 1690 765">US features are usually not pathognomonic and further diagnostic tests are required to confirm a diagnosis. Differential diagnosis may be possible if the presence of a cystic wall, lateral cone shadow, little calcifications, or if an echoic and anechoic spiral (“ball of wool” image)(plate 4b) is clearly seen within a focal hepatic lesion.</p>
<p data-bbox="224 843 382 875">Type CE5</p> <div data-bbox="256 918 484 1239">  </div>	<ul data-bbox="585 843 1690 1079" style="list-style-type: none"> • Status: inactive • Cysts characterised by thick calcified wall which is arch shaped, producing a cone shaped shadow. Degree of calcification varies from partial to complete. • Size variable: CE5s (< 5.0 cm), CE5m (5 – 10 cm), CE5l (> 10cm) <p data-bbox="585 1100 736 1132">Remarks:</p> <p data-bbox="585 1158 1151 1189">Cyst not fertile in the majority of cases.</p> <p data-bbox="585 1215 1690 1295">Diagnosis is uncertain. Features are not pathognomonic but highly suggestive for <i>E. granulosus</i>.</p>

TYPE OF CYST

CL

CE1

CE2

CE3

CE4

CE5

ACTIVE

TRANSITIONAL

INACTIVE

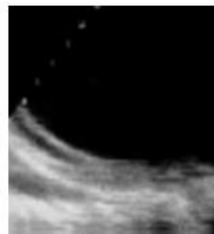
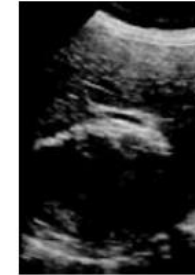
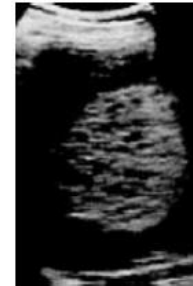
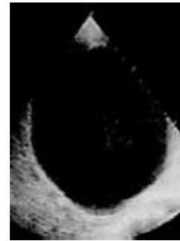
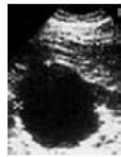


Fig. 2. Summary of the cystic lesions and types of CE cysts seen in US showing active, transitional and inactive cyst types which follow the natural history of CE.

Hidatidosis

Conclusiones

- Patología sistémica de gran importancia
- Poco estudiada en Colombia
- Existen escasos estudios que permitan conocer en realidad su real dimensión
- Existen factores de riesgo por consumo de alimentos contaminados y contacto cercano con hospedadores definitivos
- Zoonosis parasitaria transmitida por alimentos

Hidatidosis

Conclusiones

- Necesidad de estudio e investigación, control y vigilancia, actualmente no se hace verdaderamente vigilancia de la misma
- El tratamiento y abordaje es complejo y debe ser siempre multidisciplinario, incluye cirugía y tratamiento con mebendazol
- No se conoce de su epidemiología en Risaralda