

ECHINOCOCCOSIS (HYDATID DISEASE)

A. GRANULOSUS ECHINOCOCCOSIS

Unilocular Echinococcosis or Unilocular Hydatid Disease)

1. AETIOLOGICAL AGENT = *Echinococcus granulosus*

- a) Cestoda
- b) Elongated Tape-like body
- c) No GIT
- d) Hermaphrodite
- e) 3 – Segmented body (immature, mature and Grand Proglottids.

2. Occurrence/Epidemiology

- a. Sheep raising regions e.g. Australia, New Zealand, East Africa, North Africa, Middle East, Argentina, Italy, Greece, Cyprus, Chile.
- b. Enabling factors
 - (1) Countries where dogs are used for herding grazing animals;
 - (2) Dog intimate contact with humans

3. Definitive = Final = Primary Host: Canine (e.g. Dogs and Wolves)

4. Intermediate Host = 2⁰ Host = Ungulates = herbivours (animals with hooves) e.g. Cow, Sheep, etc.

5. TRANSMISSION/Developmental Biology

- (A) Transmission to man (Zoonosis)
- (B) Biology of Development of the Parasite.

ECHINOCOCCOSIS *granulosus*

6. Diagnosis (In Man)

(A) Microscopic exam for **Hooklets**, **Scolices** and **cyst membranes** in

- a. Sputum
 - b. Vomitus
 - c. Urine
 - d. Faeces
- } after the rupturing of cysts.

- (B)
- a. Immuno electrophoresis
 - b. Indirect haemagglutination
 - c. Latex flocculation
 - d. **Intradermal (Casoni's Test)**

(C) CONFIRMATION

By examination of tissues obtained surgically or at necropsy

- (D) IDENTIFICATION: Encapsulated cyst in liver (60%), Lungs (20%), and sometime (**Kidney** (4%), **Heart**, Brain (3%), etc.

7. CLINO-PATHOLOGICAL FEATURES

- a. Symptoms usually mechanical from enlarging cysts
- b. May be generalized from absorbed toxin or allergins
- c. Enlarging cysts cause **Jaundice**, **portal hypertension** from compression of liver parenchyma the resulting complication being Cholangitis and rupturing
- d. Cyst in Lungs

- cough, vomit
 - hemoptysis
 - dyspnea
 - chest pain
 - Pneumo-thorax, emphysema, anaphylactic shock, death.
 - In brain = Jacksonia epilepsy and blindness
- e. Hypersensitivity (by ruptured cysts), leading to purities, urticaria, cough, vomiting, diarrhea, asthma, anaphylactic shock, death.

8. TREATMENT

1. Surgical removal of cysts without rupture (why?)
(= To reduce the chances of seeding & recurrence
and anaphylactic shock)

NB: @ operation, cysts should be sterilized before drainage or extirpation to prevent anaphylactic shock.

ECHINOCOCCUS MULTILOCULARIS

1.
 - a. Int. host = microtine rodents.
 - b. Final host = Canine (dogs, wolves, foxes, etc.).
 - c. Primarily Liver disease but of Lungs too.
 - d. Cyst unrestricted by strong intact laminated membrane like in **E. granulosus**. Therefore, **E. multilocularis** is invasive in the liver and may disseminate by metastasis.

2. **PATHOLOGY** - depends on **Size** and **Location**.

3. **PROGNOSIS** - Grave because of invasive and metastatic potential/
tendencies.

NB: i. Only larval stage (hydatid cyst) develops in man

Therefore Man = 2⁰ host and a blind ally because man – man transmission does not occur except by cannibalism.

ii. Hydatid disease is Zoonosis (animal disease transmitted to man).

4. **MORPHOLOGY OF HYDATID CYST.**

- i. Hydatid cyst is whitish, spherical, fluid-filled and a few mm to several cm in size.

ii. Cyst wall is anucleated laminated membrane lined by nucleated germinal membrane.

iii. a. **Fertile cyst** contain brood capsule, arising from germinal layer by a short stalk.

b. **Sterile cyst** - never produce Brood Capsule or Scolices

brood c. **Scolices** develops from inner germinal layer of each capsule.

calcareous d. Each **Scolex** has 4 Suckers, 2 rows of hooklets and a body.

in the e. **Daughter Cyst** is detached brood capsule moving freely fluid (only in **E. granulosus**)

fluid of f. **Brood Capsule** may rupture, releasing scolices into the the cyst.

g. **Hydatid sand** is daughter cyst + free scolices.

NB: In patients with hepatic hydatidosis, care must be taken before treatment for West African Sleeping Sickness using antimonial arsenic compounds, (why?)

ECHINOCOCCOSIS: Granulosus vs. Multilocularis

VARIABLES	E. granulosus	E. multilocularis
1. Secondary host	Ungulates (herbivorous)	Microtine rodents (carnivours)
2. Pathology	< Severe	V. Severe
3. Prognosis	Mild	Grave
4. Metastasis	Laminated layer Prevents multiplication	Very Invasive
5. Cyst type	Unilocular	Multilocular
6. Final Host	Dog, wolves, foxes	Dogs, wolves,
7. Disease transmission	Zoonotic	Zoonotic
8. Tape worm	3 proglottids	3 poglottids
9. Reproduction	i. Apical budding	
	ii. Sexual Reproduction (Self & Cross)	
	iii. Asexual (cyst)	