



Intestinal nematodes

Part 1

Presented by

Professor Dina Abou Rayia



Intestinal nematodes



- Inhabit the large intestine:
- Trichuris trichiura

- Inhabit the small intestine:
- Ascaris lumbricoides
- Hookworms
- Strongyloides stercoralis

Trichuris trichiura (Whip worm)



Geographical distribution: Cosmopolitan

Adults from 3-5 cm



- Cellular esophagus
- One set of genitalia







Shape: Barrel shape with two polar mucoid plugs

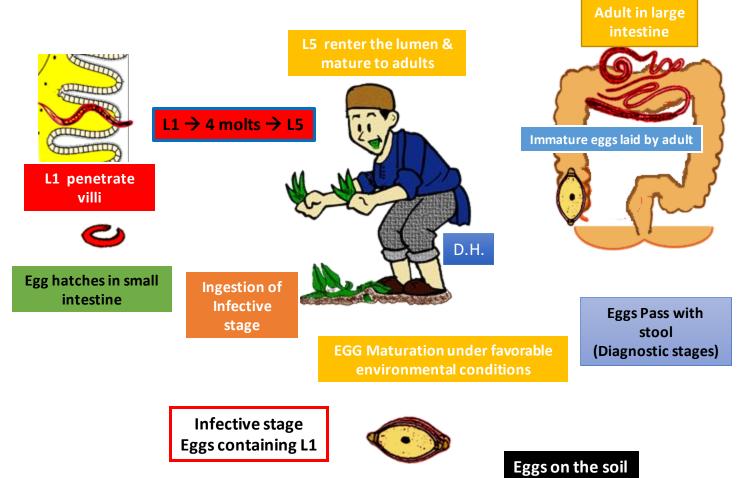
Colour: Brownish Content: Immature





Life cycle of Trichuris trichiura

SOIL



Trichuris trichiura (Whip worm)



Habitat: Large intestine

Hosts:

- D.H: Man

- R.H: Monkeys and pigs



Diagnostic stages:

- Immature eggs
- Adults
- Infective stage: Mature embryonated egg containing first-stage larva

Mode of infection:

- Ingestion of contaminated food.
- Ingestion of mature eggs with contaminated hands from soil.⁵

Pathogenesis & Symptomatology



Disease: Trichuriasis

- ➤ Embedded anterior part ⇒ haemorrhage and mucosal ulceration.
- ➤ Distension, nausea, vomiting, abdominal pain & bloody diarrhea.
- Dysentery: Due to the affection of rectal mucosa tenesmus with mucus and blood and rectal prolapse especially in children.

Obstruction of the appendix and secondary bacterial infection appendicitis & abscess.

Diagnosis:

Detection of eggs or adults in stool or by colonoscopy

Treatment: Albendazole

Anaemia:

- hypochromic anaemia: Due to continuous blood loss from bleeding sites or blood sucked by the worm.
- Hyperchromic pernicious anaemia: Due to toxins.

Growth retardation









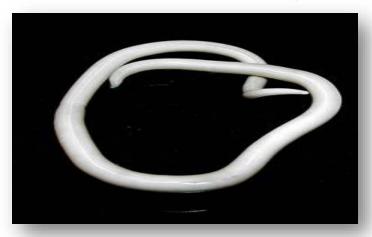
Ascaris lumbricoides

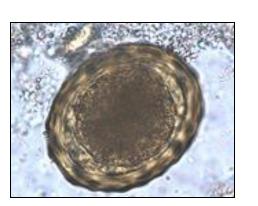


• Geographical distribution: Cosmopolitan

Adults 20-40cm.

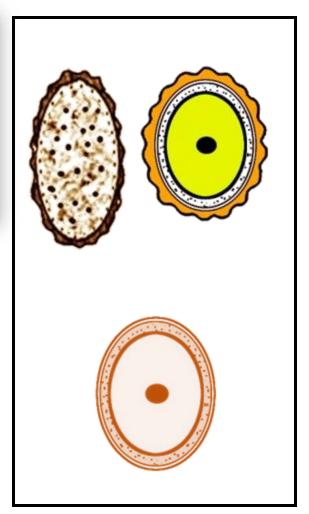
- Club shapedesophagus and mouth with 3 lips
- Male has 2 spicules
- Female has 2 sets of genitalia











Eggs (D.S)



1-Fertilized egg

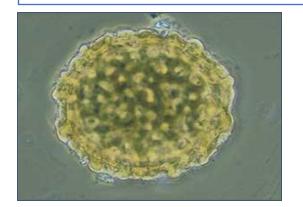
-Size: $60 \times 45 \mu m$

-Shape: Oval to round.

-Shell: Inner thick shell and outer mamillated coat.

-Color: Golden brown (bile stained).

-Content: <u>Immature</u> (one- cell stage).



2- Unfertilized egg

-Size: 90 × 45 μm.

- Shape: Elongated.

- Shell: Thinner with illdeveloped mamillated coat.

- Color: Golden brown.

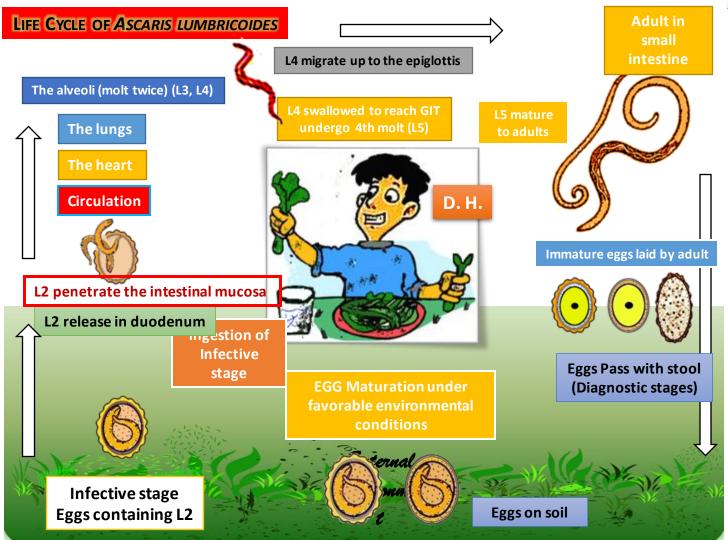
- Content: Multiple refractile granules.

3- Decorticated egg

Fertilized or unfertilized egg that loses the mamillated layer.







Ascaris lumbricoides



Habitat: Small intestine

Hosts:

- D.H: Man

Diagnostic stages:

- Immature eggs (fertilized-unfertilized and decorticated)
- Adults
- Infective stage: Mature embryonated egg containing second-stage larva

Mode of infection:

- Ingestion of contaminated food and drinks.
- Ingestion of mature eggs with contaminated hands from soil.

Pathogenesis and symptomatology Disease: Ascariasis



1) Larval migratory phase

Out of the intestine



Larvae may carry micro-organisms from

the intestine

blood

- to different organs
- abscess formation.

To the lung



- -Heavy infection:
- Bronchial asthmaand oedoema (allergic)
- Verminous pneumonia

(Loeffler's syndrome)

20%

Fever, cough, dyspnea, hemoptysis& eosinophilia

To general circulation

Only in massive infection



Larvae may reach general

circulation \bigcirc different organs \bigcirc

as brain, liver, kidney, heart

eosinophilic granulomatous

lesions.

2) Intestinal phase



Light infection ⇒ no symptmes

Intestinal symptoms

1

Colic , abdominal distension , vomiting, diarrhea or constipation, epigastric pain, dyspepsia (due to anti pepsin & anti-trypsin substances produced by adults that interfere with protein and fat digestion)

Malnutrition and underdevelopment of children with heavy infection **Nervousness** and irritability due to toxic effects of biproducts of living or dead worms

Vit. A deficiency \bigcirc night blindness

3) Complications



(3)

↓(1)

Worm migration by fever, spicy food, drugs or anesthesia

Obstruction of the pancreatic duct acute pancreatitis.

- -Obstruction of the bile duct \bigcirc cholecystitis and obstructive jaundice.
- -Entering liver parenchyma liver abscess.
- -Stomach \bigcirc vomiting.
- -Oesophagus \bigcirc escapes from the mouth.
- -Nasopharynx \circ escapes from the nose.
- -Oropharynx

 Eustachian tube

 middle
 ear and exit through external auditory meatus.
- -Hypopharynx and trachea aspirated suffocation and lung abscess.

(2)

Intestinal obstruction

Perforation of the intestinal wall

peritonitis





Laboratory diagnosis

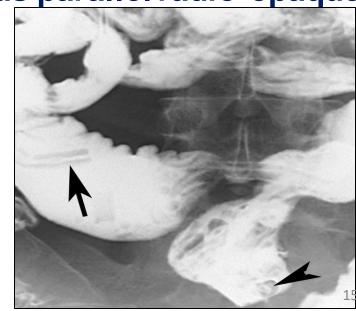


- 1) Detection of eggs in stool by direct or concentration
- 2) Detection of the adult worms in stools or vomits.
- 3) Detection of adult worms in the abdomen by X-ray

after barium meal. They appear as parallel radio-opaque

shadows (tram way sign).

Treatment: Albendazole





Explain why?



 A patient with ascariasis should be treated before any surgical procedures.

Anaemia may complicate Trihuris trichiura infection