



Helminths Lec.2

Clinical features

pinworm-infected persons are asymptomatic.

The adult worms may cause slight irritation of the intestinal mucosa

Infection common in the children, more in females than male

the adult worm rare can be seen in the stool, but in the skin of perianal area

About one-third of pinworm infections are asymptomatic. Perianal pruritus, irritation is the cardinal symptom, the itching which is often worse at night as a result of the nocturnal migration of the female worms to laying the eggs into perianal area which may lead to excoriation and bacterial superinfection

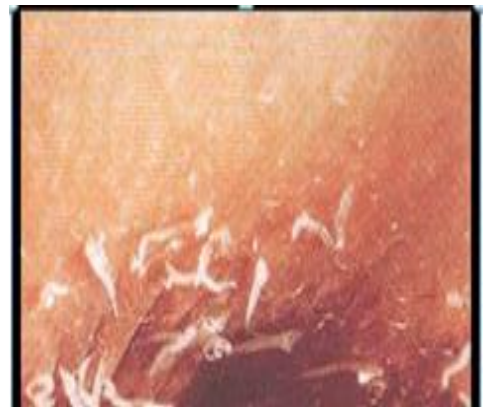
worm migrates at night induce sleep disturbance, nocturnal enuresis

Heavy infections have been alleged to cause abdominal pain and weight loss.

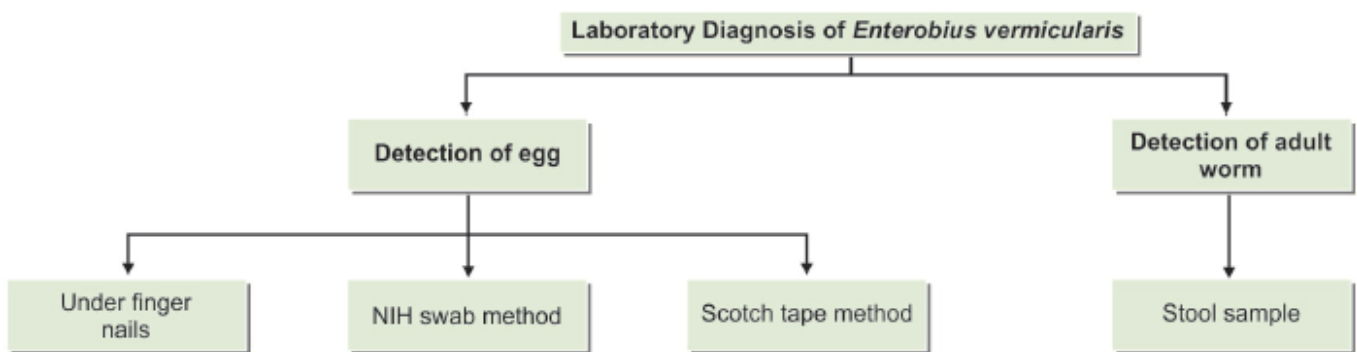
On rare occasion pinworms invade the female genital tract, causing vulvovaginitis, salpingitis or granuloma of the pelvic or peritoneal cavity.

appendicitis especially in children.

Eosinophilia is uncommon.



Laboratory Diagnosis :



Pinworm infestation can be suspected from the history of perianal pruritus.

Diagnosis depends on the demonstration of the eggs or adult worms

Demonstration of Eggs

Eggs are present in the feces only in a small proportion of patients and so feces examination is not useful in diagnosis.



Egg can be demonstrated in swabs collected from the sites perianal area in early morning, before going to the toilet or bathing.

Swabs from perianal folds are most often positive.

The eggs may sometimes be demonstrated from beneath the finger nails in infected children

NIH Swab Method

The NIH swab (named after National Institutes of Health, USA)

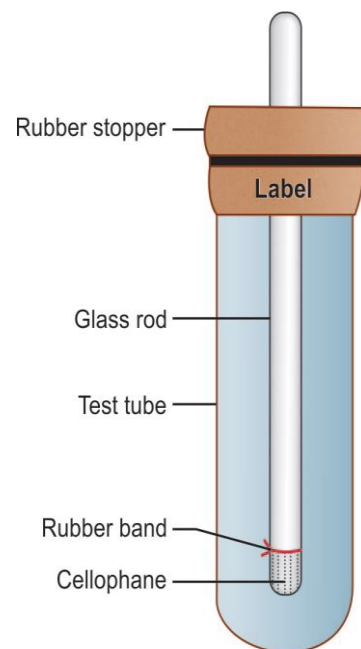
NIH swab. A piece of transparent cellophane

is attached with rubber band to one end of a glass rod, which is fixed on a rubber

stopper and kept in a wide test tube

The cellophane part is used for swabbing by rolling over the perianal area .

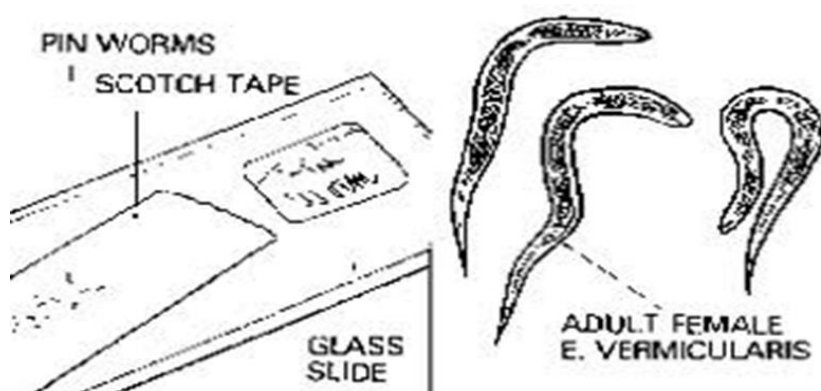
It is returned to the test tube and sent to the laboratory, where the cellophane piece is detached, spread over a glass slide and examined microscopically



Scotch Tape Method

Another method for collection of specimens is with scotch tape (adhesive transparent cellophane tape)

The tape is transferred to a glass slide, sticky side down, with a drop of toluene for clearing and examined under the microscope



Demonstration of Adult Worm

The adult worms may sometimes be noticed on the surface of stools

They may occasionally be found crawling out of the anus while the children are asleep.

They may be detected in stools collected after an enema and may be in the appendix during appendectomy.



Note: Unlike the other intestinal nematodes, *Enterobius* infection is not associated with eosinophilia or with elevated IgE

Treatment

Infected children and adults should be treated: Albendazole (400 mg once) or mebendazole (100 mg once) can be used for single dose therapy. while piperazine has to be given daily for one week.

It is necessary to repeat the treatment after 2 weeks

As pinworm infection usually affects a group, it is advisable to treat the whole family or group of children in school

Prevention and control

- 1-All the patients should be treated.
- 2-Health education for community and personal hygiene such as frequent hand washing, finger nail cleaning and cut, and regular bathing .
- 3-Frequent washing of night clothes and bed linen..

Trichuris trichiura

Trichuris trichiura or whipworm.

Disease called *Trichuriasis*, whipworm infection.

first described by Linnaeus in 1771.

Trichuris means a 'hair-like tail' (Greek *trichos*—hair, *oura*—tail).

This name is not quite correct because it is the anterior end of the worm that is hair-like and not the tail.

The name whipworm is more apt as the thick posterior part resembles the stock and the thin anterior end resembles the lash of a whip.

It is worldwide in distribution, but is much more common in the tropics.

The infection is widespread in tropical Africa, South America, and South-east Asia.

Some 800 million people are estimated to be infected with this worm

Habitat

T. trichiura lives in the large intestine.

The adult worms are found attached to the wall of the caecum and less commonly in appendix, colon, and anal canal



Morphology

The adult worm is flesh colour ,the shape it resembles a whip, with the anterior 3/5 is thin and thread-like .

the posterior 2/5 is thick and fleshy appearing like the handle of a whip .

the anterior portion which contains the capillary oesophagus embedded in the mucosa .

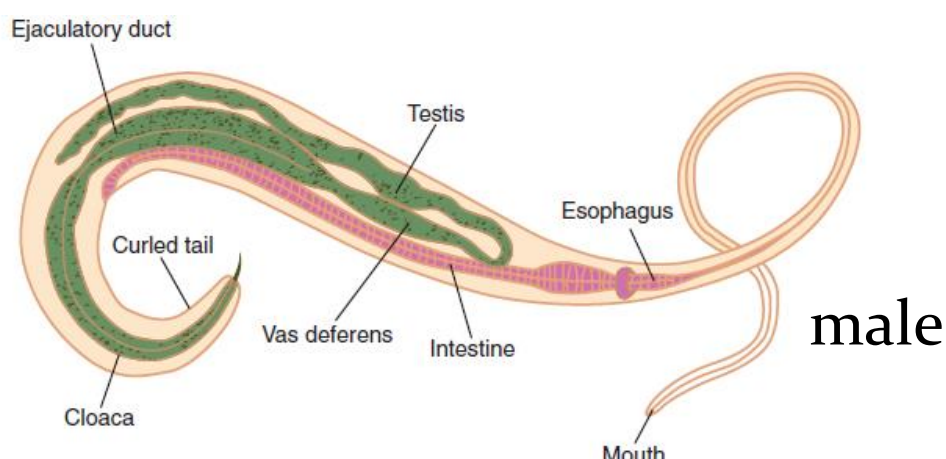
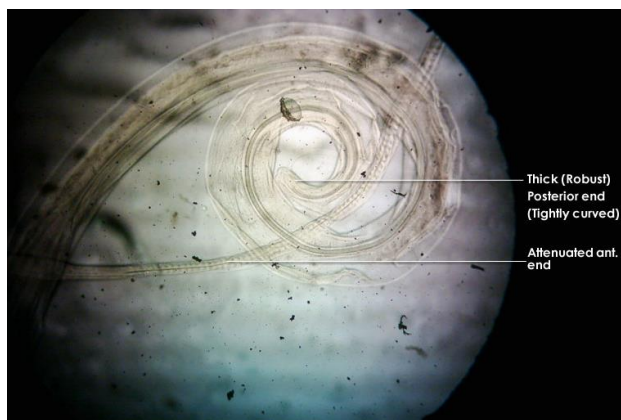
posterior part contains the intestines and reproductive organs

The male 30-45mm long , posterior end coiled ventrally .

The female 40-50mm long ,the posterior end straight ,blunt and rounded

Humans are the only natural host for *Trichuris trichiura* But similar worms are found in pigs and monkeys

Adults



Egg

The egg brown in color being bile-stained.

It has a triple shell, the outer most layer of which is stained brown.

It is barrel-shaped and about 50 µm long , 25 µm wide in the middle, with a projecting mucus plug at each pole containing an unsegmented ovum .

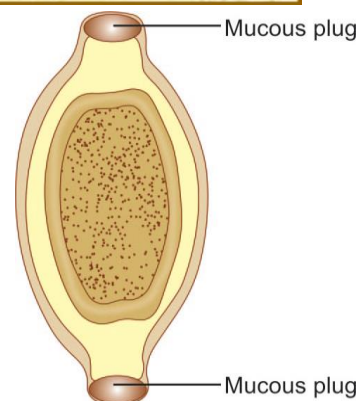


The plugs are colorless.

the egg foats in saturated salt solution.

When freshly passed, the egg contains an unsegmented ovum, it is not infective for humans.

The fertilized female lays about 5,000 eggs per day



Helminths whose eggs float in saturated salt solution

- Enterobius vermicularis
- Ancylostoma duodenale
- Necator americanus
- Ascaris lumbricoides
- Trichuris trichiura

Nematodes present in large intestine

- Enterobius vermicularis
- Trichuris trichiura

Nematodes present in small intestine

- Strongyloides stercoralis
- Ascaris lumbricoides
- Ancylostoma duodenale
- Necator americanus
- Trichinella spiralis
- Trichostrongylus spp.

Life Cycle

Natural host: Man.

No intermediate host is required.

Infective form: Embryonated eggs containing Rhabditiform larva.

Adult female worm lives in large intestine, worm lays eggs which are discharged in feces.

The egg undergoes development in soil, optimally under warm, moist, shady conditions, when the infective rhabditiform larva develops within the egg in 3–4 weeks.

At lower temperatures, this may be delayed for 3 months or more, these embryonated eggs are infective to man.



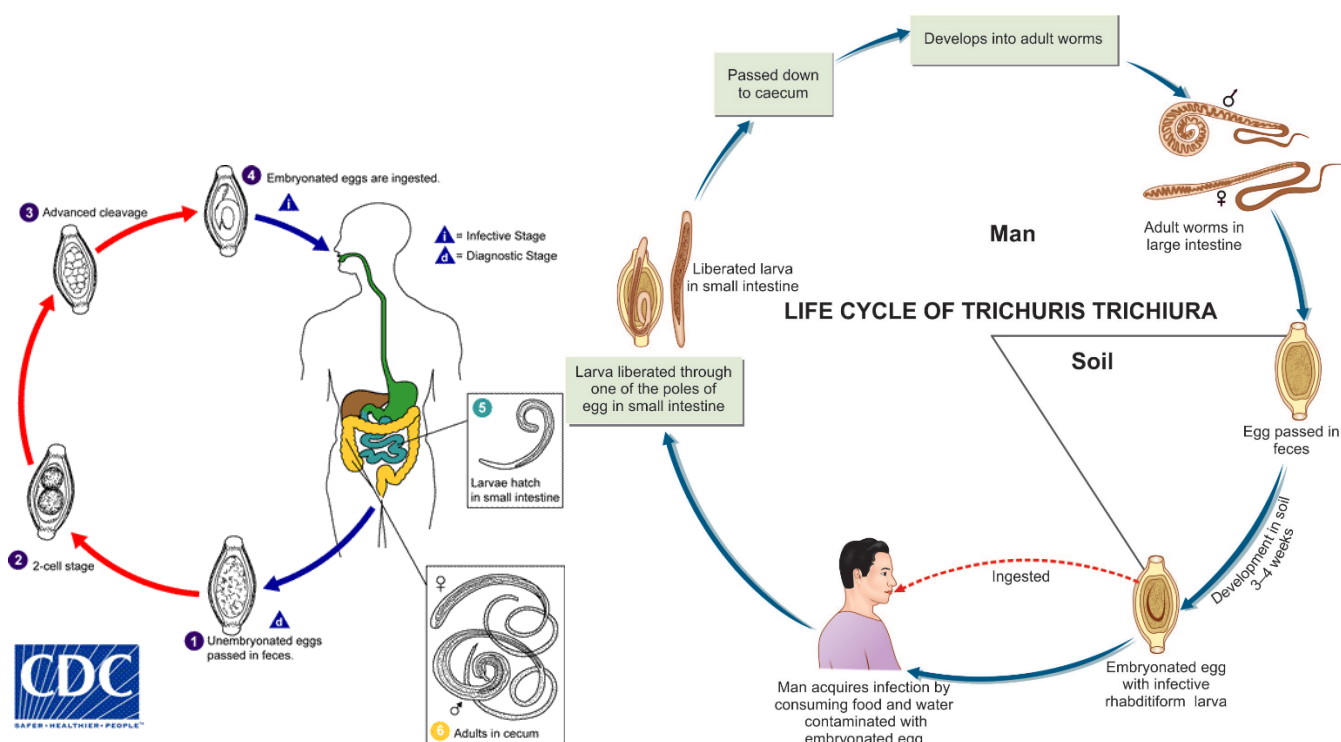
Mode of Transmission: Infection occurs in humans when the mature embryonated eggs containing the infective larvae are swallowed in contaminated food or water.

The eggs hatch in the small intestine and the larva penetrate and develop in the intestinal villi within 3-7 days, and then return to lumen and migrate to the cecum.

In about 2–3 months, they become mature adults and lie embedded in the cecal wall, with the thread-like anterior portion piercing the mucosa and the thick posterior end projecting out.

The gravid adult female lays eggs, which are discharged in feces and the cycle is repeated. Eggs start appearing in feces usually about 3 months after infection.

The worm has a lifespan of 5–10 years.



Pathogenicity and Clinical Features

The disease called (trichuriasis, whipworm infection, or trichocephaliasis) is asymptomatic, except when the worm load is heavy.

Disease may result either due to mechanical effects or allergic reaction.

The worms lie threaded into the cecal mucosa and even though it is not a blood feeder, oozing of blood may occur at the sites of attachment.

The blood loss is about 0.005 mL per worm per day. Over a period of time, this may lead to anemia and malnutrition.



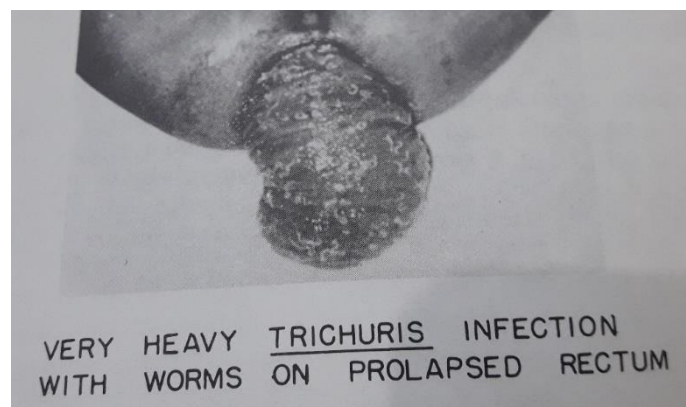
mechanical blockage of the appendiceal lumen by masses of whipworms may cause acute appendicitis

In heavy infection, the worm may be abundant on the colonic mucosa, even upto the rectum.

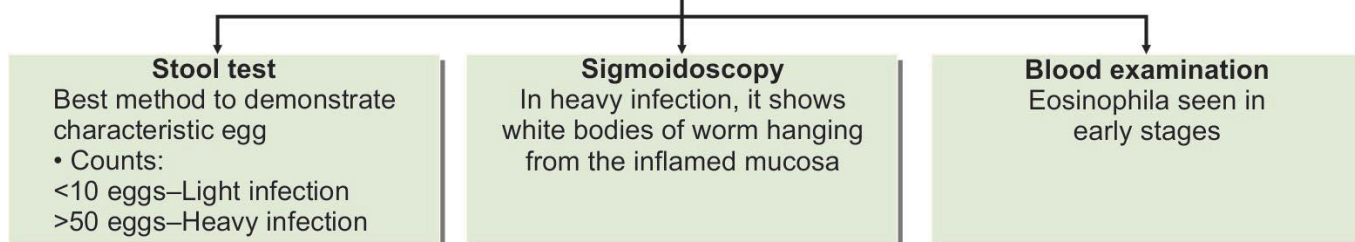
Mucus diarrhea, chronic dysentery and abdominal pain, and weight loss .

Some patients particularly young children, may develop rectal prolapse. with whipworm dysentery.

In heavy infection, sigmoidoscopy may show white bodies of worm hanging from the inflamed mucosa called coconut cake rectum



Laboratory Diagnosis of *Trichuris trichiura*



Treatment:

Mebendazole (100 mg 12 hourly for 3–5 days) or

Albendazole (single dose of 400 mg) are effective with cure rates of 80%.

Prophylaxis

- 1-Proper disposal of feces.
- 2-Avoiding consumption of unwashed fruits and vegetables.
- 3-Treatment of infected persons.