General introduction
※ Distributed worldwide, mainly in southeast Asia.
※ Larval infection of *S. mansoni* may cause serious clinical disease --- Sparganosis
Morphology

※ Adult worm measures 60-100 cm in length
※ Scolex is elongated and spoon-shaped. It is characterized by the presence of two sucking grooves.
※ Consists of about 1000 proglottids.
※ Gravid proglottids are similar with mature proglottids
Gravid proglottid
Egg

52-78 µm × 31-44 µm
Light yellow in color
Operculum
**Plerocercoid / Sparganum**

- tape-like, unsegmented body
- white in color
- Infective stage
Life cycle

Requires two intermediate hosts and one definitive host.
- Definitive host: dog, cat etc
- 1\textsuperscript{st} intermediate host: fresh water copepod
- 2\textsuperscript{nd} intermediate host: frog
- Transport (paratenic/transfer) host: snake, bird, mammal
- Human can serve as the second intermediate host, transport host and even the definitive host (rarely)
- Infective stages: plerocercoid / sparganum (transport host), proceroid (the second intermediate host)
Mode of Infection:
☆ drinking-water by ingesting copepods infected with procercoids.

☆ ingesting larvae contained in raw or undercooked meat of animals infected with sparganum.

☆ by larval transfer (applying the flesh, such as frog or snake, as poultice on the eye or wound).

In Vietnam, Thailand and part areas of China, frogs are popularly believed to have an antiphlogistic effect, and their muscles are applied as poultices. This custom is responsible for ocular sparganosis.
Pathogenesis and clinical features

- Adult worm occasionally inhabits in human. It rarely causes pathological lesions.
- Depends on the number and size of sparganum and the organs involved
- Sparganosis in human is a tissue infection caused by plerocercoid. The most common localization of the sparganum are subcutaneous connective tissue and superficial muscles.
The types of sparganosis include:

- **Ocular sparganosis**: painful edema of the eyelids, with lacrimation and pruritus. mainly in Vietnam, Thailand and parts of China.

- **Subcutaneous sparganosis**: nodules

- **Oral sparganosis**: nodules in oral mucosa

- **Cerebral sparganosis**: its clinical manifestation resemble that of brain tumor. Seizures, headache, and focal neurological signs are common.

- **Visceral sparganosis**: intestinal wall, perirenal fat, and mesentery. vital organs are rarely affected.
Ocular sparganosis
Ocular sparganosis
Subcutaneous sparganosis

Cerebral sparganosis
Diagnosis

- For adult *S. mansoni* infection, it is based on the demonstration of eggs in feces by microscopy.
- For sparganosis, only removing the nodular lesion and confirming the presence of the sparganum can make specific diagnosis.
Epidemiology

- Worldwide distribution
- Mainly found in east and southeast Asia. The disease also has been recorded in United States, Latin America, Europe, Africa and Australia.
Prevention and control

- Avoiding ingestion of contaminated water
- Making sure that meat that might contain sparganum is sufficiently cooked
- Avoiding using the tissue of frogs of other cold-blooded animals for medical purpose.
- Surgical removal of sparganum and the nodule containing the larva.
Case report

HISTORY

A 26-year-old Colombian housewife came to the office because she noted some white “tapes” in her stool. The patient has enjoyed good health. She came to China 4 years earlier. She delivered a healthy infant 2 years prior to this visit, following an uneventful pregnancy.
She denied any gastrointestinal or central nervous system problems. She lived in a rural area of Colombia not far from Bogota, the capital. She had eaten pork and beef on many occasions. Since finding the “tapes” in the stool, 3 days prior to visiting the doctor, she has experienced anorexia, some nausea and abdominal cramps, but no diarrhea.
LABORATORY

Hemoglobin, white blood cell count, Urinalysis, – normal
Stool exam – reveals *Taenia spp.* eggs
Staining one of the segments she brought in is depicted in Fig.
QUESTION 1.

Your diagnosis is
(A) *Spirometra mansoni*
(B) *Taenia solium*
(C) *Taenia saginata*
(D) *Echinococcus granulosus*
ANSWERS 1.

(B) *Taenia solium*, the pork tapeworm. Firstly, she is passing “tapes,” thus excluding *Echinococcus granulosus* which does not exist in the adult stage in humans. Secondly, the segment in the figure is of the *Taenia* species. Differentiation between the beef and pork tapeworm can be made by staining a gravid segment and counting the pairs of uterine branches. If the numbers are less than 13, it is *Taenia solium*, the pork tapeworm. If greater than 15, it is *Taenia saginata*, the beef tapeworm.
QUESTION 2.

The infection was acquired by
(A) ingestion of flea vector
(B) ingestion of poorly cooked pork
(C) ingestion of poorly cooked beef
(D) transmission from a dog
(B) She acquired her infection from insufficiently cooked pork that harbored cysticercus of *Taenia solium*.

This patient developed symptoms after finding the “tapes” in the stool. Thus, other than some mild abdominal discomfort, most symptoms are psychogenic in origin. Occasionally, a patient can feel movement in the abdomen. Diarrhea alternating with constipation, hunger pains, and chronic indigestion have been reported.
QUESTION 3.

Should this patient be hospitalized for treatment?

(A) No
(B) Yes
(C) Only if pregnant
(D) Only if over 50 years of age
(B) Hospitalization is indicated because this is the pork tapeworm. While the worm is relatively innocuous in the intestine, ingestion of eggs can lead to cysticercosis. The possibility that regurgitation of the worm into the stomach may result in ingestion of eggs and that cysticercosis ensues, makes hospitalization and close observation essential during treatment.