Opisthorchiasis

*Opisthorchis viverrini*(Southeast Asian liver fluke)

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Objectives

1. Overview on opisthorchiasis.
2. Geographical distribution.
3. Morphology of *Opisthorchis viverrini*.
4. Life cycle.
5. Pathogenicity & clinical picture.
6. Diagnosis of opisthorchiasis.
7. Treatment of opisthorchiasis.
8. Prevention and control.
Overview

• **Opisthorchis** is a parasitic flatworm of class Trematoda.

• It infects biliary tract of various fish eating mammals including humans.

• **Opisthorchis viverrini**, known as Southeast Asian liver fluke.

• The disease caused by the fluke is called opisthorchiasis.

• **Opisthorchis viverrini** causes cancer in humans.
Opisthorchis viverrini

Geographical distribution:
- Southeast Asian countries including: Thailand, Laos, Vietnam and Cambodia.

➢ Opisthorchiasis is not endemic in Egypt, however imported cases may occur.
**Adult morphology:**

1) lancet shaped, thin & transparent, 7 x 1.5 mm.

2) **Suckers:** oral and ventral sucker.

3) Digestive system.

4) Genital system:

   - **Testes:** two diagonal, deeply lobed.
   - **Ovary:** multilobed in front of testes.
   - **Uterus:** long and convoluted.
   - **Vitelline glands:** numerous follicles in the lateral fields between ventral sucker and testes.
Egg:

- **Size:** 27x15µ.
- **Shape:** oval.
- **Shell:** thick.
- **Special character:** **opercular shoulder and terminal knob.**
- **Colour:** yellowish brown (bile stained).
- **Contents:** **mature** (miracidium).
Cercaria:
- *Pleurolophocercus cercaria* formed of a body and tail.
- Body: has 2 suckers, primitive gut, 2 eye spots, 5 pairs of penetration glands, cystogenous glands and excretory bladder.
- Tail: simple, longer than the body, provided with cuticular sheath.
Life cycle:

Habitat: bililary tract.

Definitive host: man.

Intermediate host:
- 1st I. H.: aquatic snail, *Bithynia*
- 2nd I.H.: freshwater fish (*Cyprinoid fish*)

Reservoir hosts: dogs, cats and other fish eating mammals.

Infective stage: encysted matacercariae in muscles of fresh water fish or under the scales.
**Stages in life cycle:** egg → miracidium → sporocyst → redia → cercaria → encysted metacercaria → adult.
Mode of infection:

- Eating raw (dried or salted) or inadequately cooked freshwater fish.

- Through fingers or cooking utensils contaminated with the metacercaria during preparation of fish.
• After ingestion of infected fish, *metacercariae* excyst in the duodenum → migrate through the *ampulla of vater* → biliary tract → mature into adults in 1 month.

• Eggs exit the bile ducts and are excreted in the feces.
Portal of parasitic entry into the liver

Right lobe of liver

Left lobe of liver

Right and left hepatic ducts

Pancreatic duct

Gall bladder

Opisthorchis

Fasciola

Opening of common bile duct and pancreatic duct
• Egg ingested by the snail I.H. and hatches inside → miracidium → sporocyst → rediae → cercariae.

• Cercariae escape from the snail and swim in water → attach to the 2\textsuperscript{nd} I. H.

• Cercariae lose their tails and encyst under the scales or in the flesh of fish → metacercariae in about 3 weeks.
Life cycle of *Opisthorchis viverrini*
Pathogenesis:

**Disease:** opisthorchiasis.

- The severity of pathology depends on intensity and duration of infection.

- The pathogenesis of *O. viverrini*-mediated hepatobiliary changes may be due to:
  1. **Mechanical irritation** caused by the liver fluke’s suckers.
  2. **Metabolic products**.
  3. **Immunopathological process**.
Clinical picture

1- Most infections are asymptomatic.

2- **Acute infection**: high fever, epigastric pain, diarrhea and tender hepatomegaly.

3- **Chronic infection**: symptoms can be more severe, and hepatomegaly & malnutrition may present.

4- In rare cases, cholangitis, cholecystitis, and **cholangiocarcinoma** may develop (**group 1 carcinogen**).
Diagnosis:

I-Clinical.

II-Laboratory:

1. Detection of mature eggs in stool samples or aspirated bile.

2. Detection of fecal *Opisthorchis* antigen has been reported.

3. Several serologic tests for the diagnosis of opisthorchiasis have been reported.
Treatment:

1. Praziquantel is the drug of choice.

2. Surgical intervention may become necessary in cases with obstructive jaundice.
Prevention and control:
1- Mass treatment of infected animal reservoir.
2- Snail destruction.
3- Avoid eating raw fish and proper cooking of fish.
4- Sanitary disposal of stool.
5- Health education.
6- Treatment of infected cases.
Thank you!