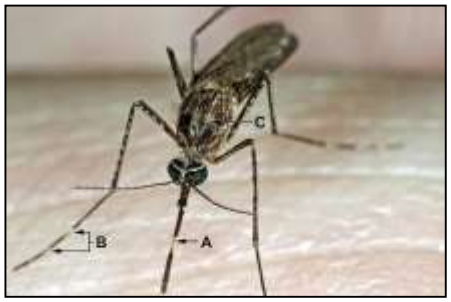



# Lymphatic Filariasis

Presented by

**Professor Dina Abou Rayia**

# Filariae affecting the lymphatic system

1. ***Wuchereria bancrofti*** **(Africa, Asia and America)**

**2. *Brugia malayi (*Southeast Asia)**

# Lymphatic Filariasis

## *Wuchereria bancrofti*

### ❖Geographical distribution

1. Tropical and subtropical regions (West & Central Africa, South America).

### ❖Habitat

Lymphatic system especially that of lower limbs

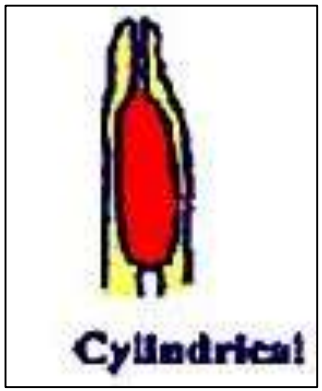
**❖D.H** Man

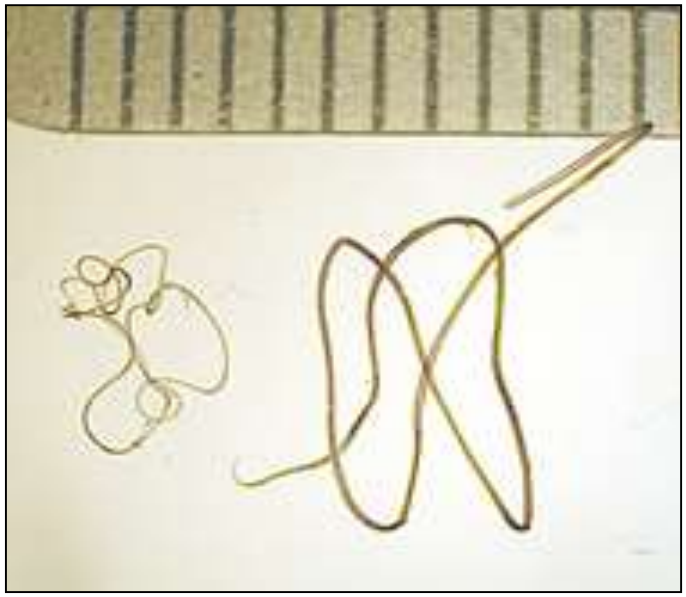
**I.H (vector)** Mosquitoes (*Culex, Anopheles, and Aedes).*

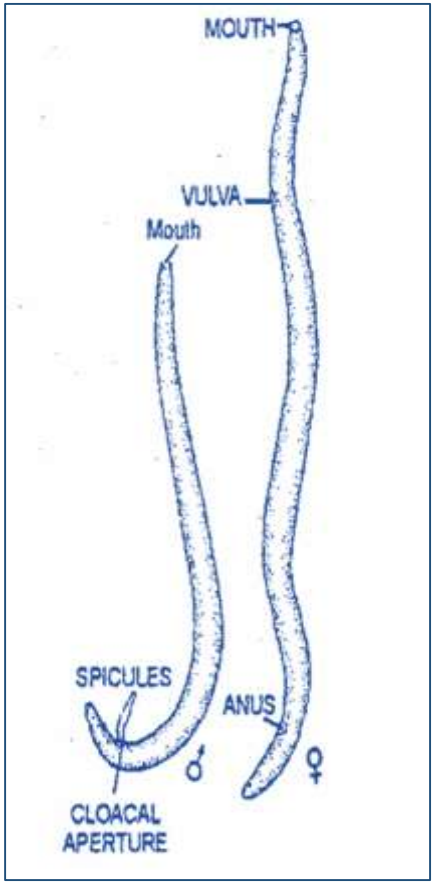
# Morphological characters

## Adult

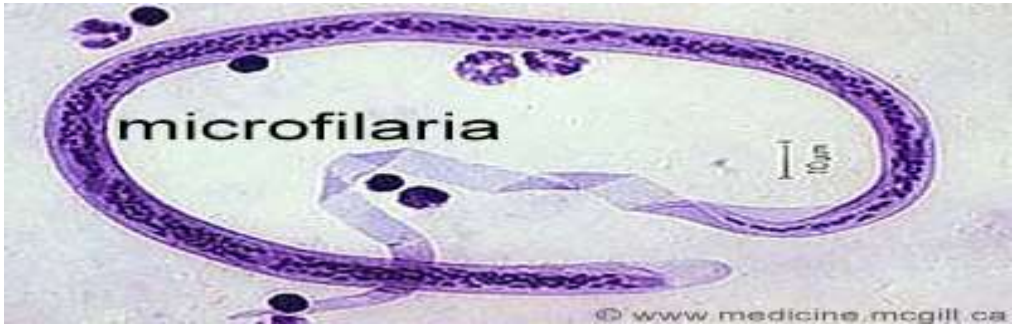
- Long thread like.
- Female deposits larvae called microfilaria.
- Male (4 cm) is shorter than female (8-10 cm).
- Adults have cylindrical esophagus





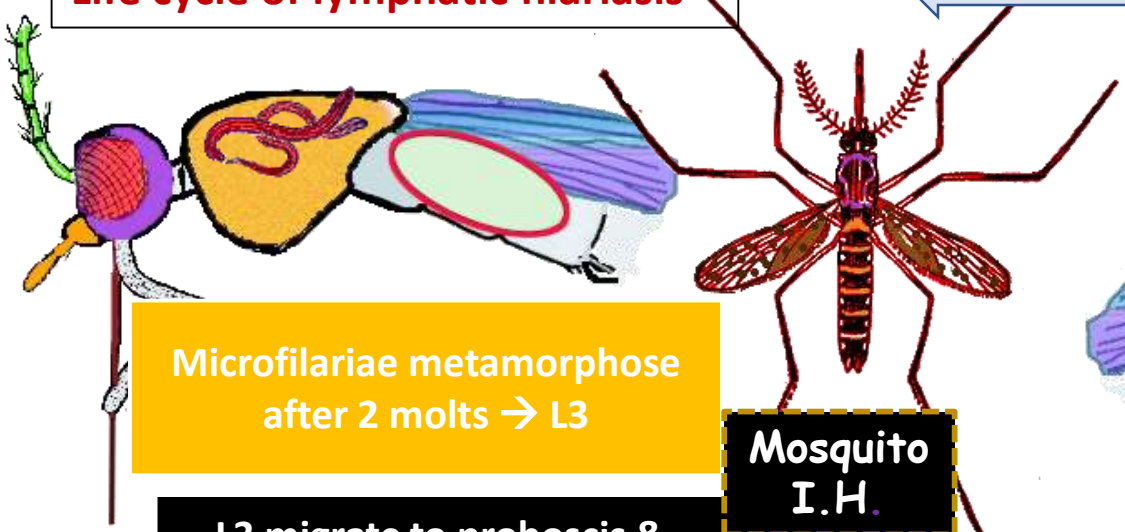
# Microfilaria (D.S)





**Microfilaria** is 250 µmx8 µm, body with smooth curves, loose sheath with deeply stained nuclei with empty ant. and post. ends & have nocturnal periodicity (10 p.m. to 2 a.m.).

# Life cycle of lymphatic filariasis

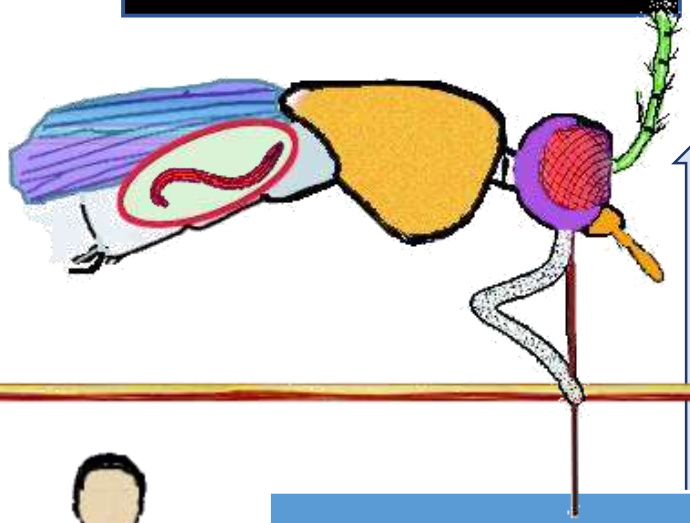


Microfilariae metamorphose after 2 molts → L3

Mosquito I.H.

L3 migrate to proboscis & drop on skin during biting

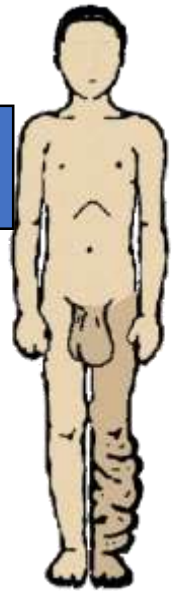
Microfilariae penetrate stomach to thoracic muscle



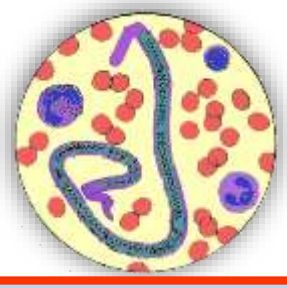
Infective (L3) enter through mosquito bite

Human D.H.

Adults in lymphatics



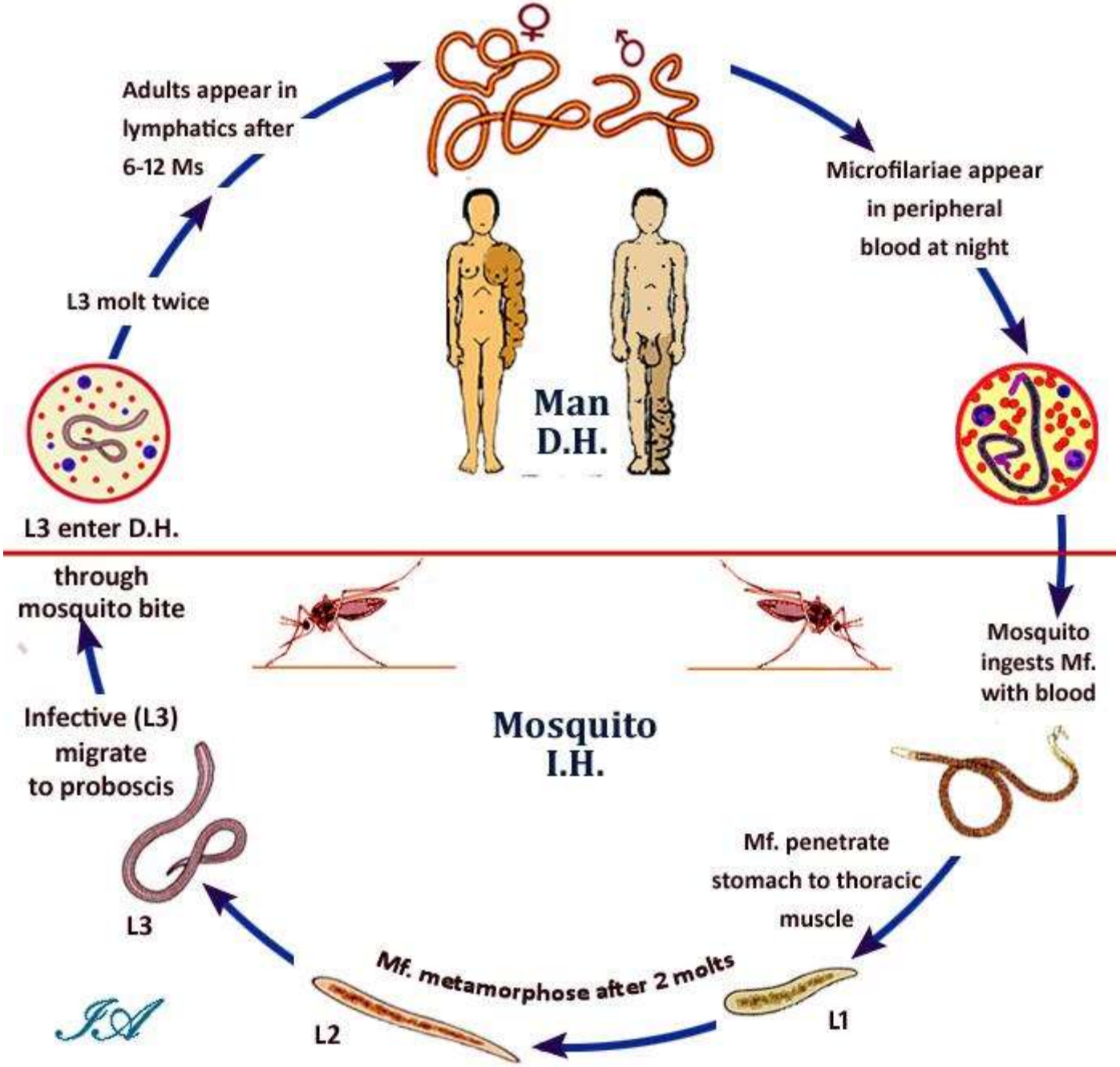
Mosquito ingests microfilaria with blood



L3 molt twice & adults appear in lymphatics after 6-12 Ms

Females Lay microfilariae in lymphatics

microfilariae appear in peripheral blood at night


Adults appear in lymphatics after 6-12 Ms
Microfilariae appear in peripheral blood at night
L3 molt twice
Man D.H.
L3 enter D.H.
through mosquito bite
Mosquito ingests Mf. with blood
Infective (L3) migrate to proboscis
Mosquito I.H.
Mf. penetrate stomach to thoracic muscle
L3
Mf. metamorphose after 2 molts
L1
L2

## Mode of infection

Mosquito bites the skin for blood meal then the infective stage (3rd stage filariform larva ) in the mouth part is inoculated in the skin through the bite wound.

## Diagnostic Stage

Loosely sheathed microfilaria in the peripheral blood at night.

## Infective stage

Third stage filariform larva

# Pathogenesis and symptomatology

**Disease: Bancroftian filariasis or elephantiasis.**

- **Pathological lesions occur in the lymphatic system, due to the presence of adult worms (living or dead) but not due to microfilariae.**

## 1. Asymptomatic phase:

**Occurs in endemic areas where patients remain asymptomatic but with patent microfilaria in their blood.**

# 2- Acute inflammatory phase

## Recurrent attacks of lymphangitis and lymphadenitis due to

- Toxic products of living or dead adult worm
- Mechanical irritation by adult worm
- Allergic reaction to adult products or died worms
- 2ry bacterial infection

## Symptoms

- fever, chills & headache
- Local lymphangitis
- Lymphadenitis
- Affection of lymphatics of
  - epididymis and testes (epididimo-orchitis)
  - Scrotaum (varicocoele & hydrocoele)
  - spermatic cord (funiculitis)
  - Vulva

# 3- Obstructive (chronic)phase

## ✓The obstruction of lymph flow is due to

- Blockage of the lumen by worms.
- Proliferation of the endothelial lining
- Fibrosis & stenosis of lymph vessels
- Fibrosis of lymph nodes draining the area.

## ✓Effects of obstruction

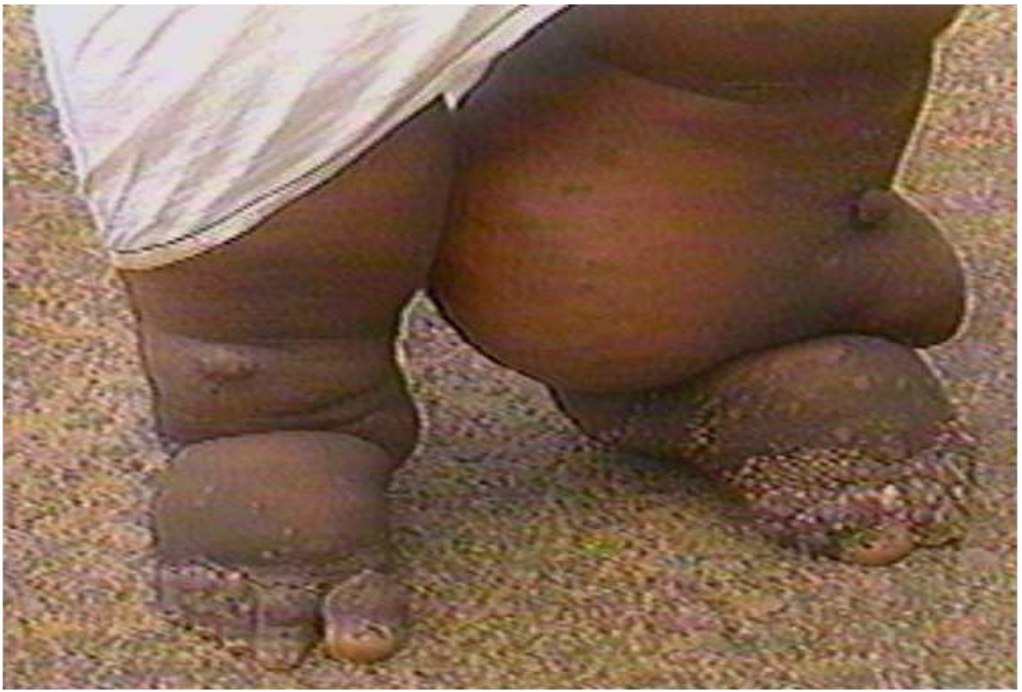
- The lymph vessels become dilated, distended &varicosed
- Oedema
- Rupture of distended vessels
  - In renal pelvis or urinary bladder ➲ Chyluria (milky urine)
  - In pleural sac ➲ chylothorax
  - Peritoneal sac ➲chylous ascitis
  - Tonica vaginalis of testis ➲ chylocele
  - Intestine ➲chylous diarrhea
- Elephantiasis

# Elephantiasis

- It occurs after a long duration (5-10 years).
- It is usually affected most dependent parts e.g: Legs, scrotum, & vulva.
- Blood sample is negative for microfilaria.

## Presented by

- Exessive protein in lymph exudate ➲stimulates proliferation of fibrous connective tissue ➲thickening of the affected part.
- The skin and underlying tissue become hard, dense, cracked and non pitting with loss of elasticity.
- The skin appears rough, folded, stretched &fissured ➲ 2nd bacteria and fungal infection.



# 4-Tropical pulmonary eosinophilia (Occult filariasis)

1. Occurs in endemic areas of filariasis due to immunologic hyperresponsiveness to microfilaria.
2. No classical lymphatic pathology and no microfilaria in the blood.
3. The microfilariae are seen in the lung tissues.
4. Scattered lung opacities with asthmatic cough and wheeze.
5. Marked eosinophilia with high IgE levels and high antifilarial antibody titer.

# Laboratory Diagnosis

- Blood examination for microfilariae
  - Wet mount preparation
  - Stained thin & thick blood films by Giemsa & Leishman
  - Concentration techniques:
    - -Knott's method
    - -Membrane filtration
  - Diethylcarbamazine (Hetrazan) Provocation test
- Aspiration of lymph nodes or hydrocele.
- Examination of urine (chyluria) for microfilaria
- X-ray for calcified adult.
- Immunodiagnosis
  - Skin test & serological testes
- PCR
- Eosinophilia

# Treatment

## Early cases

1)Diethylcarbamazine (Hetrazan) mainly against microfilariae

2) Ivermectin the same use as DEC but single dose

3) Albendazole effective againat adults

4) Corticosteroids

## Late cases

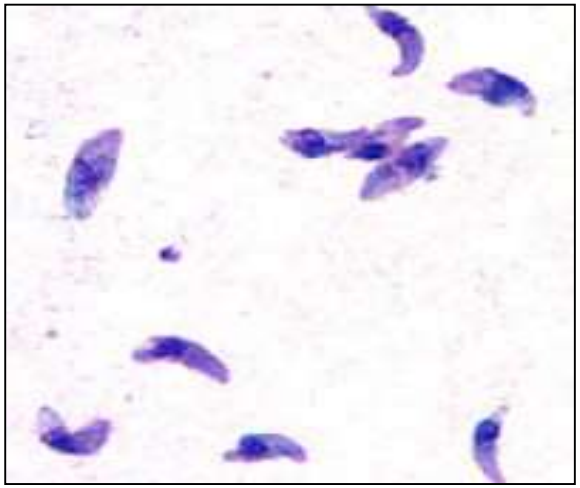
Surgical treatment

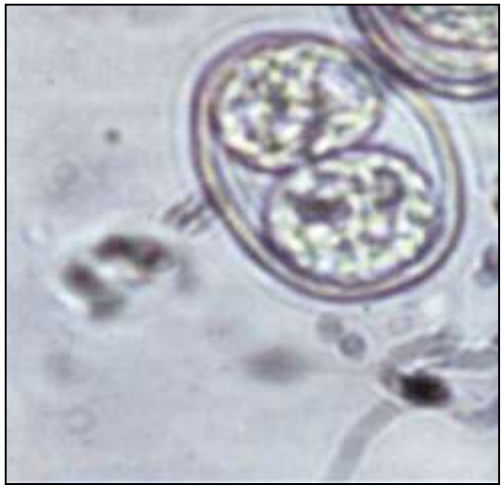
# *Toxoplasma gondii*

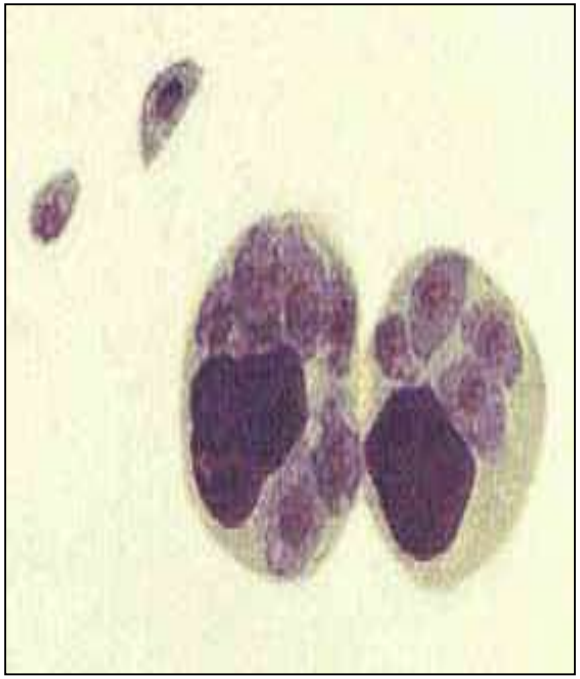
❖**Habitat:** intracellular in any tissue cells of the host except mature RBCs.

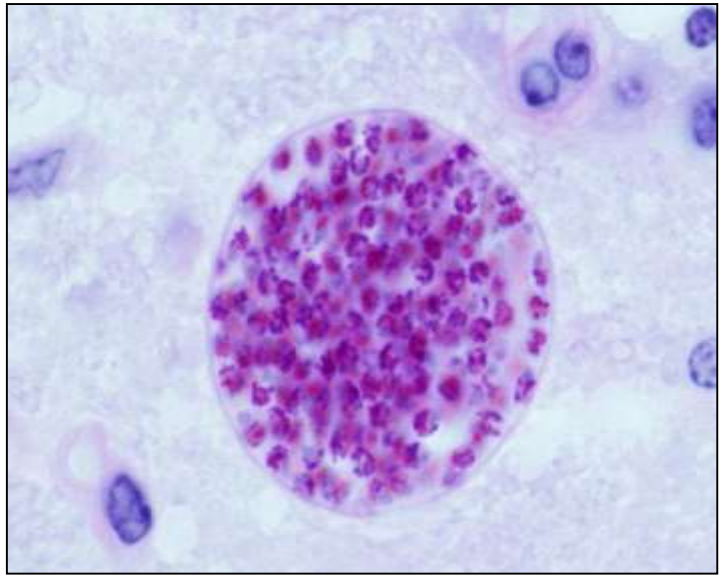
❖**Morphology:**

- **Trophozoite:** Crescentic, 5x3 µ with one pole more rounded. 
- **Oocyst:** derived from cat 10x12 µm  (disporocystic tetrazoic)
- **Pseudocyst:** without true cyst wall and the host cell contains rapidly dividing tachyzoites 
- **True cyst:** with true cyst wall and slowly dividing bradyzoites 









# Life Cycle of Toxoplasma gondii

DR/IBRAHIM

**Sexual enteric cycle in D.H**

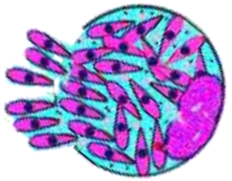
Schizogony & Gametogony

Immature oocysts pass with faeces

Mature within 3-4 days

**Infective to all hosts by ingestion**

intestine



Multiply in lymphoids of intestine

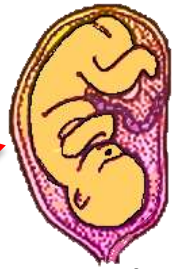
Spread to various organs

Pseudocysts and cysts are formed

**Asexual exoenteric cycle in I.H**

**Infective to all hosts by ingestion**

Congenital infection of the foetus by trophozoites



# Modes of infection

**(1)- Congenital (transplacental)**

- when the mother is infected for the 1st time during pregnancy.

**(2)- Acquired**

- Ingestion of undercooked meat with pseudocysts and cysts e.g. beef, pork and lamb.
- Ingestion of oocyst in food and drink directly or indirectly by flies.
- Inhalation of oocysts with dust infected with cat faeces
- Blood transfusion & tissue transplants
- Laboratory exposure to infection with trophozoites

# (A)- Congenital toxoplasmosis

**If the mother is infected before pregnancy**

**She will develop antibodies (Ig G) that cross the placenta and protect the baby against infection.**

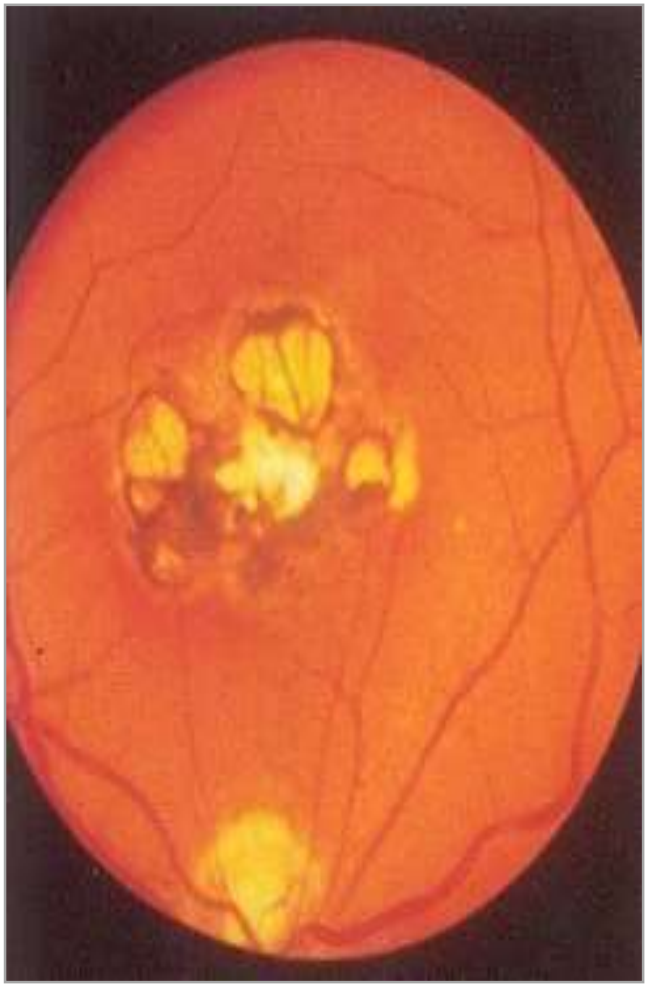
**If the mother is infected in the 1st or the 2nd trimesters for the 1st time**

**Abortion or still birth (born dead) occurs.**

**If the mother is infected in the last trimester for the 1st time**

**The baby will be born with congenital anomalies as:**

**1-Hydrocephalus.**
**2-Microcephalus.**
**3-Encephalitis.**
**4-Cerebral calcification**
**5-Mental retardation.**
**6-Chorioretinitis.**



# (B)- Acquired toxoplasmosis

## Immunocompetent patient

- **Glandular form** with fever and enlarged liver, spleen and lymph nodes and sore throat.
- **Acute exanthematous form** with high fever, skin rash and L.N enlargement.

- **Latent cysts:** in the eye, brain and muscles which are asymptomatic

## Immunocompromised patient

- If the immune system is suppressed, dormant cyst become reactivated resulting in flare up & possibly dissemination of the infection **(Reactivation)**.
- Most cases present with **CNS manifestations** (encephalitis, brain abscess, meningitis ), **myocarditis&pneumonia**

# Laboratory diagnosis

## Direct methods

- Examination of biopsy from enlarged lymph nodes.
- Samples from blood, CFS or bone marrow

## Indirect methods

### Immunodiagnosis

1-I.D.test (toxoplasmin, Frenkel test ).
2- Serological tests (for IgG & IgM): CFT, IHAT, ELISA, IFAT
3- Antigen detection by ELISA
4- Sabin- Feldman dye test (failure of trophozoites to stain with methylene blue in the presence of the antibodies)

### PCR

### CT scan & X ray

**IgG avidity test ????**

# Treatment

(1)- Combination of pyrimethamine ( Daraprim ) + sulphadiazine + Folic acid.

(2)- Spiramycin used most often for pregnant women to prevent the infection of their child.

(4)- Laser or cryotherapy for chorioretinitis.

(5)- Systemic corticosteroids.


?
Quiz
Time

- ***Wuchereria bancrofti*** **infection could be transmitted by blood transfusion ???? Why ???**

- ***Toxoplasma gondii*** **could be transmitted by autoinfection ??? Why????**

- **Though *Toxoplasma* is widespread in nature the disease is rare???**