

# Inflammation - Lecture 10

## Filariasis

**Cause:- Microfilaria of Wuchereria bancrofti.** This microfilaria migrates to lymphatics and settle in lymph nodes where they mature into adult worm

- The bite of the Culex pipiens mosquitoes inoculate Microfilaria of Wuchereria bancrofti

*inoculate = يلقح*

**Pathological Features:-**

### **1) Lymphangitis and lymphadenitis**

- filarial granuloma leads to fibrosis, lymphatic obstruction and dilatation (lymph varices)

*lymph varices = الدوالي الليمفاوية*

### **2) Lymphatic Obstruction**

**Causes ->**

a) Mechanical obstruction by worms

b) Secondary bacterial infection by streptococci (lymphangitis)

**Effects ->**

a) Elephantiasis

- Develops in 10-15 years



- Mainly affecting the lower limbs
- The limb is progressively enlarged and skin appears markedly thickened, rough and fissured due to lymphedema & fibrosis

### **b) Chylous (lymph) Effusion**

- Chylous ascites inside peritoneal cavity
  - Chylothorax inside pleura
  - Chylocele inside tunica vaginalis of testis
- \*\* These are due to rupture of the lymphatic varices

### **c) Filarial Funiculitis**

- Inflammation of the spermatic cord with filarial granuloma and fibrosis

## **Hydatid Disease**

**Def:-** A parasitic disease caused by tapeworm of the Echinococcus type

**Cause:-** Handling soil, dirt or animal hair that contains eggs. Normal hosts are dogs, humans are accidental intermediate hosts.

**Pathological Features:-**

*- Develops as a slowly spherical unilocular cyst*

*spherical cyst = كيس كروي*

*- Commonest sites are the liver and lungs*

*- Cysts are filled with clear hydatid fluid*

**- The wall of the cyst is formed of :-**

- 1) Inner germinal layer**
- 2) Laminate chitinous avascular membrane**
- 3) Outer layer** formed of fibro-vascular tissue

**- New cysts may originate from the inner germinal layer**

**- It induces a granulomatous reaction composed of macrophages, giant cells and eosinophils followed by fibrosis**

**Complications:-**

- 1) Pressure atrophy** on the surrounding organs
- 2) Allergic manifestations** in the form of urticarial eruptions resulting from cyst rupture during surgical removal or by trauma
- 3) Anaphylactic Shock** resulting from cyst rupture in the blood stream
- 4) Secondary Cysts Formation**
- 5) Abscess Formation** due to secondary bacterial infection

## **Bilharziasis of Urinary Bladder**

**Cause:- Schistosoma hematobium**

**Pathological Lesions:-**

- 1- Hyperemia & Petechial hemorrhage**
- 2- Sandy Patches:** patches of calcified ova surrounded by fibrosis and covered with atrophic mucosa
- 3- Bilharzial Polyps** formed of CT core containing ova & chronic inflammatory cells and covered with hyperplastic epithelium

**4- Bilharzial Ulcer** with sharp edges, granular floor and firm fibrotic base

**5- Dense Fibrosis**

**6- Epithelial Changes (precancerous):-**

-> **Hyperplasia** of Transitional epithelium

-> **Brunn's Nests:** group of hyperplastic transitional epithelium embedded in submucosa

-> **Cystitis Cystica** seen in submucosa due to hydropic degeneration in the center of Brunn's nest (transitional epithelium)

-> **Cystitis Glandularis** due to columnar metaplastic changes in cystitis cystica, this lesion is precancerous

-> **Squamous metaplasia & Leukoplakia**

-> **Dysplasia & Carcinoma in Situ**

**Complications:-**

**1) Terminal Hematuria** causing microcytic hypochromic anemia

في دم في البول هيسبب انيميا

**2) Bacterial Infection** of bladder wall leading to fistula formation

**3) Ova, epithelial debris and infection** help formation of phosphate stones

**4) Fibrosis** at bladder neck causes hypertrophy and dilatation of bladder wall as well as ureter causing hydroureter and hydronephrosis (enlarged)

ممکن لو حصل infection يتحولوا ل pyoureter, pyonephrosis

**5) Bladder Squamous cell carcinoma** on top of squamous metaplasia and leucoplakia

## Intestinal Bilharziasis

**Cause:- Schistosoma mansoni**

**Pathological Lesions:-**

**1- Hyperemia & Petechial hemorrhage**

**2- Sandy Patches:** patches of calcified ova surrounded by fibrosis and covered with atrophic mucosa

**3- Bilharzial Polyps** formed of CT core containing ova & chronic inflammatory cells and covered with hyperplastic epithelium

**4- Bilharzial Ulcer** with sharp edges, granular floor and firm fibrotic base

**5- Dense Fibrosis** causing narrowing of intestine

**NB:** Marked fibrosis in submucosa prevents the ova from reaching the intestinal lumen. The stool in this case contain no ova in a condition known as **Closed intestinal Bilharziasis**

**Note:** there are no epithelial changes so it's not precancerous

**6- Bilharzial Granuloma**

**Complications:-**

**1) Bilharzial Dysentery** characterized by diarrhea, passage of blood and mucous in stools with tenesmus ( tenesmus is the need to pass stool despite an empty colon )

**2) Intestinal Hemorrhage** causing microcytic hypochromic anemia

**3) Chronic intestinal obstruction** due to fibrotic stenosis or presence of large polyp

**4) Intussusception** as large polyp may cause abnormal peristalsis causing intussusception (intussusception causes infarction)

**5) Bilharzial hepatic fibrosis:** bilharzial ova may migrate as emboli through the portal vein to the liver causing bilharzial hepatic fibrosis

### **Bilharziasis of the liver (Bilharzial hepatic fibrosis)**

It's a **complication of close intestinal bilharziasis**. Emboli of ova & dead worms reach the liver from intestine by the portal blood

intestinal bilharziasis يعني لازم الاول يحصل

#### ▪ **Gross picture:**

1. early, the liver is **enlarged**, but later with progressive portal fibrosis, the liver becomes shrunken, firm, with irregular surface and thickened capsule
2. the cut section shows **dark brown bilharzial pigments**

#### ▪ **effects of bilharzial hepatic fibrosis:**

##### **1. portal hypertension:**

due to fibrosis around branches of portal vein and angiomatoid reaction between branches of hepatic artery and branches of portal vein.

Angiomatoid reaction = تكون أوعية جديدة

#### **Portal hypertension leads to:**

- portal congestion and GIT disturbances (malabsorption & diarrhea due to congestion)
- splenomegaly and maybe **hypersplenism**
- ascites: abnormal fluid in peritoneal cavity
- opening of the anastomosis between portal and systemic circulation causing esophageal varices, piles, and caput medusa circulatory disorders زي ما خدنا قبل كده في

##### **2. thrombosis of portal and splenic veins by stasis** الدم بطيء فيهم

### 3. disturbance in liver functions

### 4. lowering of serum albumin causing ascites

### 5. sever hematemesis (يعني قيء مع دم) & liver failure

**very imp note:** hematemesis is the main cause of death in both intestinal bilharziasis and bilharzial hepatic fibrosis

هي السبب الاساسي للموت في الحالتين عشان ال intestinal bilharziasis في الاخر هتبقى bilharzial hepatic fibrosis

### Hypersplenism:

a disorder in which the spleen destroys immature blood cells

ال spleen المفروض بيدمر الي مش محتاجينهم بس لما يزيد عمله هيدمر الخلايا السليمة

## Rhinoscleroma

### ▪ definition:

chronic granulomatous disease affecting **nasal cavity, nasopharynx,** and **larynx** caused by a bacterial known as Klebsiella

Rhinoscleromatis (rhinoscleroma is due to a bacterial infection)

### ▪ grossly:

irregular, firm mass which causes: bleeding, deformity, and destruction of nasal cartilage with airway obstruction

### ▪ microscopically:

1. initially inflamed granulation tissue
2. later, hyperplastic mucosa, granulomatous inflammation, **foamy macrophages (also called miculicz cells)** (macrophages filled with fats due to digesting bacteria), **plasma cells** with russel bodies (excessive immunoglobulin inside plasma cells)
3. variable vasculitis and ulceration

4. late fibrosis, lymphocytes, and plasma cells, but no **miculicz cells** (they decrease with time)

## Actinomycosis

- definition:

chronic suppurative granulomatous inflammation caused by a bacteria known as **Actinomyces**

**Chronic suppurative** = بيبكون صديد بس فيه خلايا الالتهاب المزمن

- grossly:

multiple deep abscess cavities open in skin by **multiple sinuses**, discharging pus and Sulphur granules which are the colonies of the organism  
البيكتيريا نفسها بتاخذ الشكل ده و بتطلع مع الصديد

- microscopically:

- lymphocytes, neutrophils, giant cells, and fibroblasts
- bacterial colonies (Sulphur granules) found at the center of inflammatory reaction, composed of basophilic **radiating filaments** بيبقى شكلها كأنها خيوط بتشع من المركز

## leprosy

- definition:

infective granuloma caused by bacteria known as **Mycobacterium leprae**

- methods of infection:

the bacteria enter through the skin or mucous membrane of the nose and upper respiratory tract

- types: بيبختلف حسب مناعة الجسم

- 1) **lepromatous type:**

a granuloma composed of macrophage (virchow's cells – lepra cells), lymphocytes, plasma cells, and giant cells (all these cells mixed together)

## lesions:

- a) skin nodules
- b) nasal obstruction and destruction
- c) destruction of nerve fibers (هيفقد الاحساس)
- d) multiple ulcers and deformities in the hand and feet

لو زادت بتعمل necrosis & gangrene

### 2) tuberculoid type: لو مناعته كويسه

mild infection in the skin or peripheral nerves occurs in patients with **higher resistance** (it's a tubercle like mass of dead tissue surrounded by inflammatory cells)

- **sarcoidosis:**

- definition:

a granulomatous inflammation characterized by non-caseating granuloma

دّة الفرق بينه وبين السيل

- cause:

unknown

- sites:

multiple lesions affect the skin, lymph nodes, lungs, bones, liver, and spleen

- microscopically:

- non-caseating tubercle formed of epithelioid cells, giant cells, and lymphocytes. The giant cells contain **schaumann bodies** and **asteroid bodies**
- **Schaumann bodies:** are laminated (طبقات) structures composed of calcium and proteins
- **Asteroid bodies:** they are satellite (شكل النجمة) inclusions
- **Old lesions heal by fibrosis** النسيج الليفي هيحل مكانه