

# Bovine Tuberculosis



# Synonyms

- Tuberculosis
- Pearly disease

• السل أو الدرن

# Definition

- TB is a chronic contagious disease of mammals caused by Mycobacterium spp. Characterized by the formation of caseous nodules specially in the lung and its associated L.N. and by dissemination to various internal organs such as liver, kidney, udder and serous membranes .....etc.

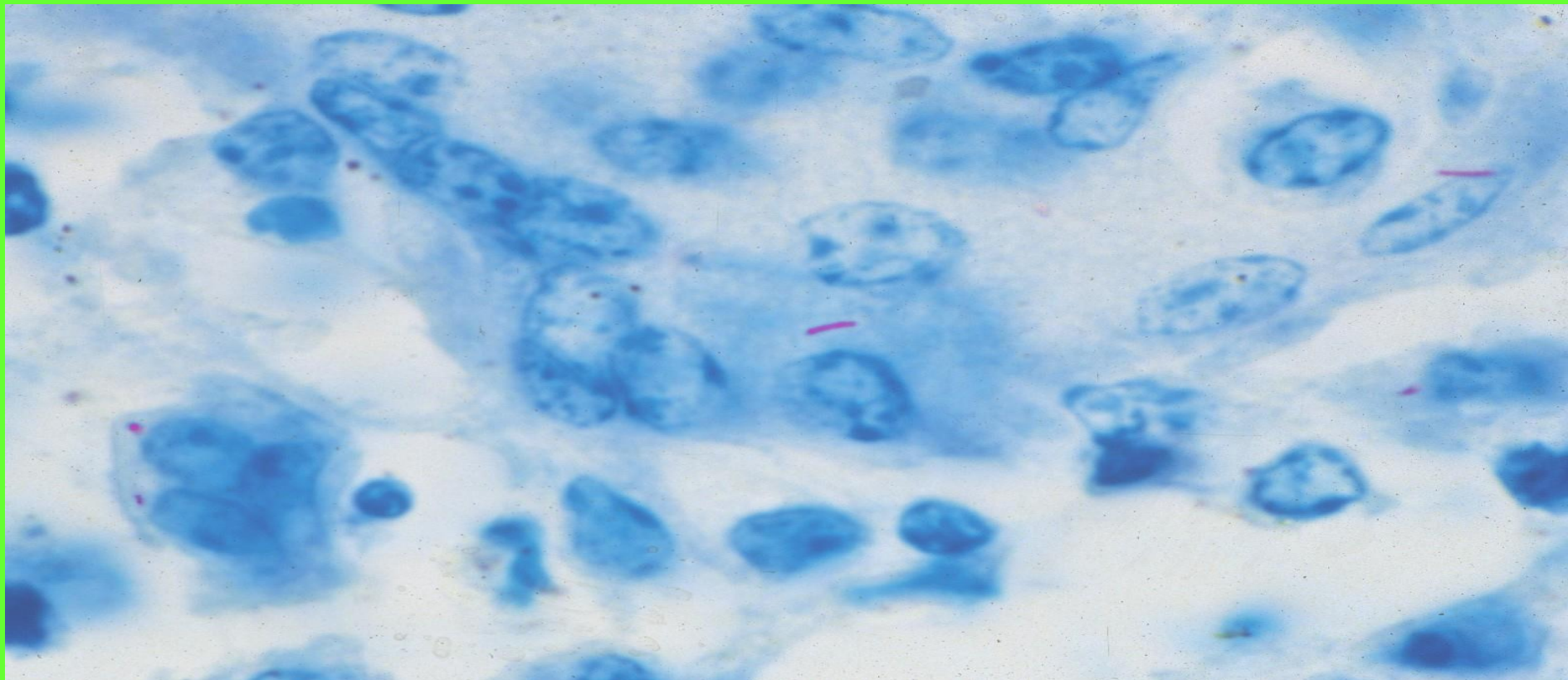
# Etiology

- **M. bovis**
- Cattle, sheep, goat, camels, pig and man
- **M. tuberculosis**
- Man and occasionally isolated from farm animals
- **M. avium**
- Avian.....also isolated from pigs and cattle

**Table1: demonstrate the pathogenicity of different Mycobacteria spp. to domestic and lab animals**

<b>species</b>	<b>M. bovis</b>	<b>M. tuberculosis</b>	<b>M. avium</b>
<b>Man</b>	+	+++	±
<b>Cattle</b>	+++	+	±
<b>Camels</b>	++	++	±
<b>Sheep</b>	+	±	+
<b>Goat</b>	+	±	±
<b>Horse</b>	+	±	±
<b>Dog</b>	+	+	±
<b>Cat</b>	+	±	-
<b>Pig</b>	++	+	++
<b>Chicken</b>	-	-	+++
<b>Rabbit</b>	++	+	+++
<b>G. pig</b>	+	++	±

Gram positive small rods, non-motile, non-spore  
forming, aerobic  
Acid fast bacilli stained by Ziehl-Neelsen stain



# Epidemiology

- **Distribution:**
- **World wide distribution including Egypt.**
- **The prevalence varies according to the efficacy of control and eradication programs.**
- **The disease was eradicated in most of the European countries.**

# **Transmission and mode of infection**

- **Sources of infection:**
- Sputum, urine, faeces, milk, semen, uterine and vaginal discharges.



# Mode of transmission

- **Inhalation: closed premises**
- **Ingestion: via milk**
- **Intrauterine infection** : via coitus or AI utensils.
- **Intramammary infection**: via teat syphons or milking machines.



# Susceptible hosts



# **Factors influencing susceptibility**

- **Housing.**
- **Stress.**
- **Management.**

# Pathogenesis

- Immune system recognizes bacteria.
- Inflammatory cells (macrophages) are sent to dispose of it.
- *Mycobacterium* is resistant to destruction
  - once ingested by the macrophages it may replicate and kill the macrophage.

# **Pathogenesis cont.,**

- **Immune system continues to send macrophages to help destroy the bacteria.**
- **Results in an accumulation of living and dead macrophages at the site of the infection.**
- **Accumulation is called a tubercle**

# Pathogenesis cont.,

- Thick capsule may form around the tubercle; called a granuloma

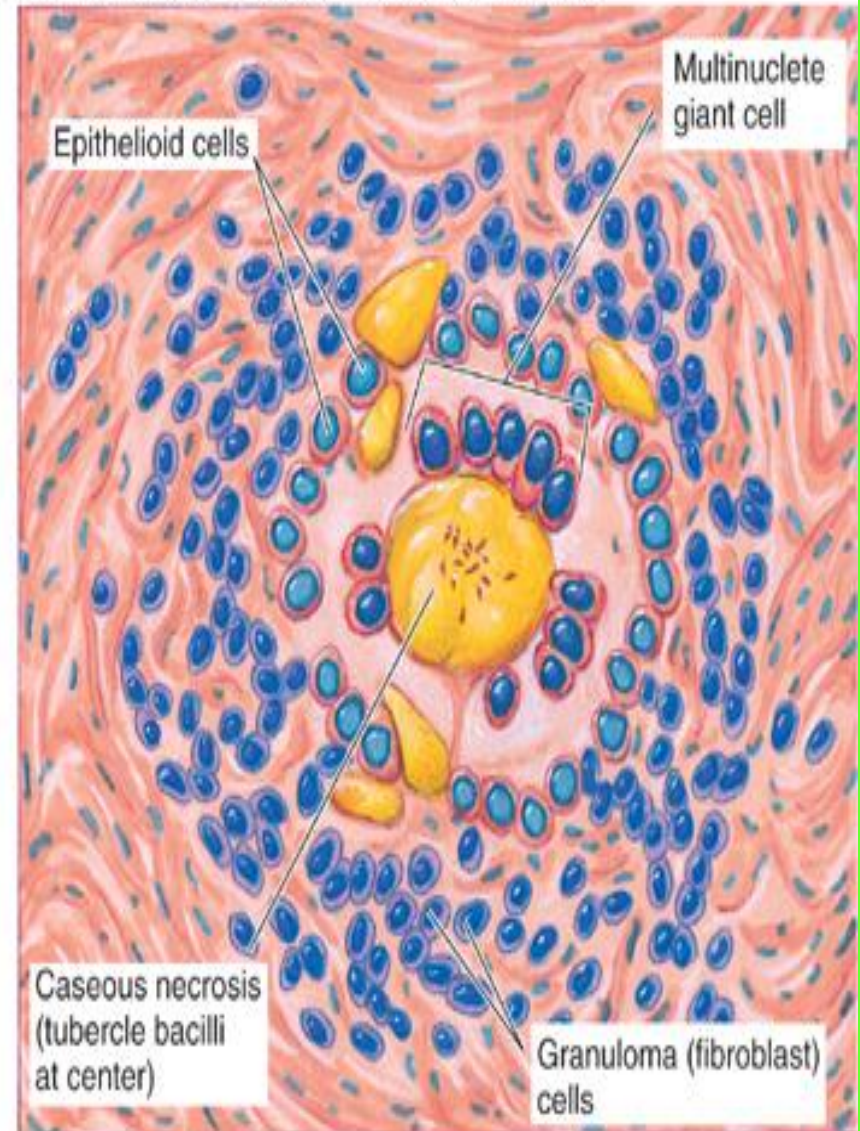


**Pericardial granuloma**





(a)  
© John D. Cunningham/Visuals Unlimited



(b)

# Clinical signs

- **IP: it varies from 2m to several years!!!!!!!!!!**
- **The morbidity and mortality rates vary according to the cattle rearing system.**
- **There is no clinical signs in the early stages of infection.**
- **Persistent cough, anorexia and loss of body condition.**
- **The alimentary form is uncommon (occasional diarrhea, recurrent bloat).**



# Clinical signs cont.,

- Sheep and goat: bronchopneumonia.
- Horse: osteomyelitis.....stiffness of the neck.
- Camels: those kept in close contact with other cattle as in Egypt.

# Diagnosis

- Case history and field diagnosis:
  - Tuberculin test...(single intradermal test, short thermal test, stormont test and comparative test).
- Lab diagnosis.....isolation and identification (smear, culture and lab animal).
- PCR

# Diagnosis cont.,

- DD:
- Bovine leukosis.....B. film
- Chronic lung abscesses.....drenching pneumonia
- TRP.
- Contagious bovine pleuropneumonia  
.....CFT

# Prognosis

- **Unfavourable**

# Treatment

- Little of value.
- Isoniazid, Para-aminosalicylic acid, ethambutol.....for up to 3 years.....HIGH COST.

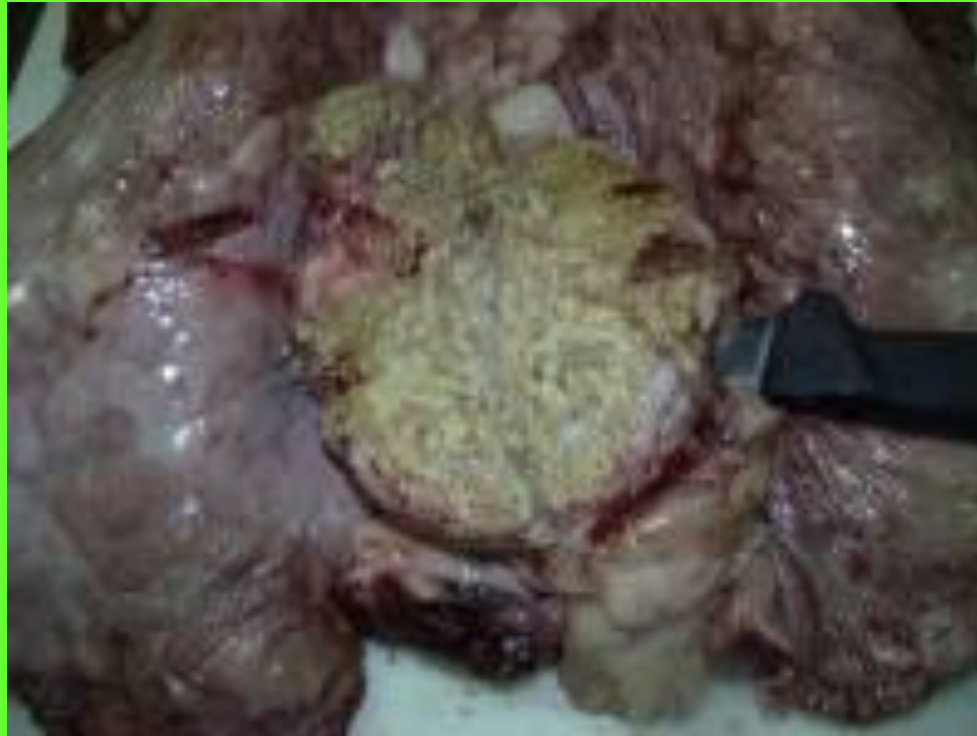
# **Prevention and control**

- **Detection of the infected cases.**
- **Elimination.**
- **Prevent the spread of infection.**
- **Vaccination: has no place  
(BCG.....incomplete immunity).**

# Infected Mesenteric lymph node



# Lesions in the lungs of a 2 yr old heifer











# Caudal Fold Tuberculin Test (CFT test)





















