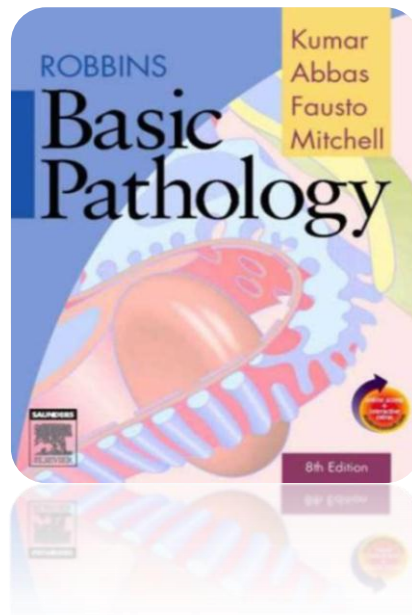


# INFLAMMATION 5

## Lecture 6

### **Granulomas Inflammation**

Notes on Dr. Ammar C. Al-Rikabi's  
handout,  
Dr. Maha Arafah



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**Please note: This paper does not replace the main sources, it's only a facilitator.**

#### **Acknowledgement**

Dear colleague, this paper was a result of hours and days of hard work from both female & male pathology teams... All what they want from you is "Dua'a"

# Granulomas Inflammation

## -Definition:

“it’s a distinctive pattern of **chronic inflammation** that’s characterized by aggregates of epithelioid macrophages with scattered lymphocytes.”

Granuloma = Nodular collection of *epithelioid macrophages* surrounded by a rim of lymphocytes

## Epithelioid macrophages:

They’re activated macrophages have squamous cell-like appearance

**A granuloma** is a cellular attempt to contain an offending agent that is difficult to eradicate.

“It’s caused by limited conditions and some of them are life-threatening”

## Granulomas can form under Four settings:

1. With persistent T-cell responses to certain microbes
2. In some immune-mediated inflammatory diseases
3. In response to relatively inert foreign bodies
4. In a disease of unknown etiology

## A - persistent T-cell responses to certain microbes

Immune granuloma mechanism:-

*Initiating events:*

- 1- indigestible antigenic material in macrophages
- 2- Antigen presentation on cell membrane
- 3- CD4+TH1 lymphocytes activation , the responding T cells produce cytokines, such as IL-2, and IFN- $\gamma$ ,

### ■ *Examples for granulomatous inflammation:*

1 - *Mycobacterium tuberculosis*

Tuberculosis is the prototype of a granulomatous disease caused by infection and should always be excluded as the cause when granulomas are identified

2- *Schistosomiasis*

3- *Leishmaniasis*

4- *Leprosy*

## B - immune-mediated inflammatory diseases

### Example:

**Crohn's disease:** type of inflammatory bowel disease and an important cause of granulomatous inflammation

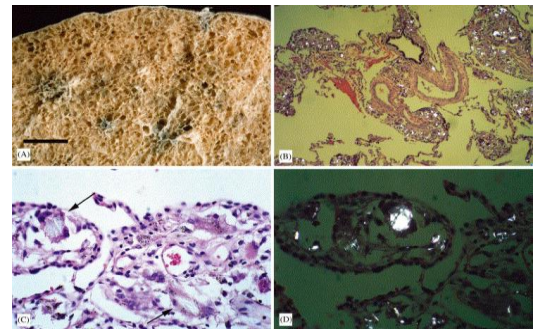
- **Caused by:** Immune reaction against intestinal bacteria or self antigens
- **Occasional noncaseating granulomas in the wall of the intestine, with dense chronic inflammatory infiltrate**

## C - In response to relatively inert foreign bodies

- **Examples for foreign bodies:**

- 1- Suture
- 2- Graft materials
- 4- Talc " associated with intravenous drug abuse"

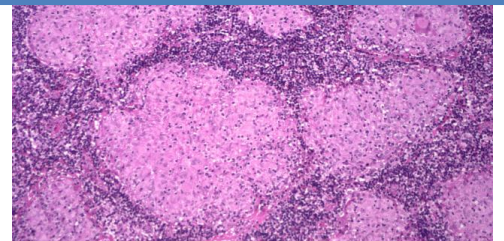
The foreign material can usually be identified in the center of the granuloma, by polarized light (appears refractile)



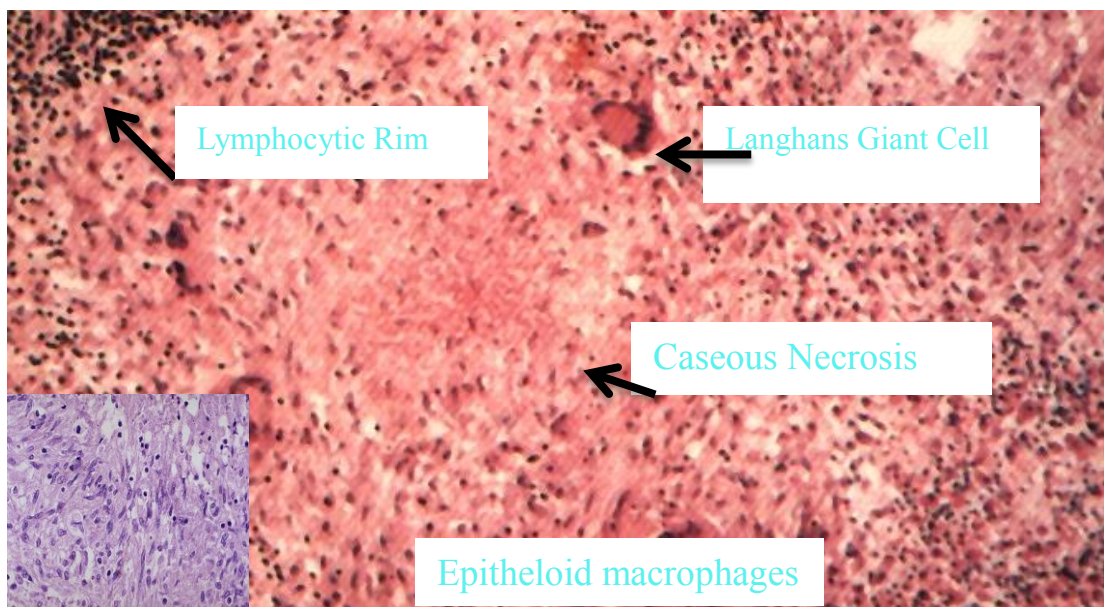
## D - In a disease of unknown etiology

- **Example: Sarcoidosis**
- **It's non caseating with abundant activated macrophages**

Lymph node: Noncaseating



## Morphology of Granulomatous Inflammation



## OUT COME OF GRANULOMATOUS INFLAMMATIONS

- **If no Rx**

**continue tissue destruction and fibrosis**

**Spread of infection to other part in the body e.g. miliary TB**

- **With adequate Rx**

**Recovery with localized scar formation at site of necrosis**

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### **“From Al-Rikaby Hand Out”**

**Granulomatous inflammation:** a type of chronic inflammation: Substances present in the inflammatory response that are not digestible by neutrophils may evoke granulomatous inflammation. Characteristic of this type of chronic inflammation are granulomas, which form 0.5 to 2.0 mm aggregations of epithelioid macrophages surrounded by a rim of lymphocytes. Epithelioid macrophages have an appearance suggestive of squamous epithelial cells due to their abundant pink cytoplasm. Granulomatous inflammation may be caused by foreign bodies, mycobacterial infection (e.g. tuberculosis, leprosy, Schistosomiasis, the gumma of tertiary syphilis, cat-scratch disease, lymphogranuloma venereum, tularemia and others). **At times, the granuloma contains caseous (cheese-like) necrosis as in tuberculosis.** Multinucleated giant cells form from the cytoplasmic fusion of macrophages. A variation of the multinucleated or foreign body giant cell is the Langhan’s giant cell which has nuclei arranged peripherally.