

# Pathology Practical

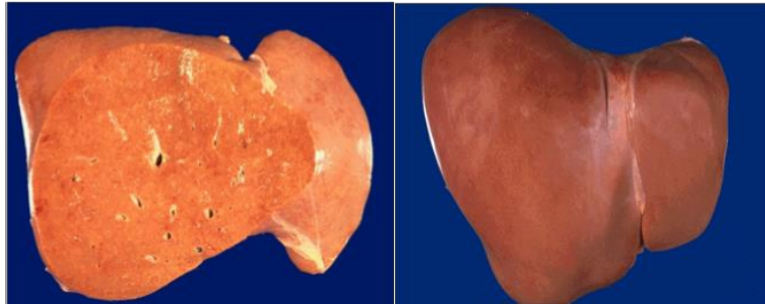
## Foundation Block

Pathology team 434



## Case 1: Fatty liver (steatosis)

### Gross appearance:



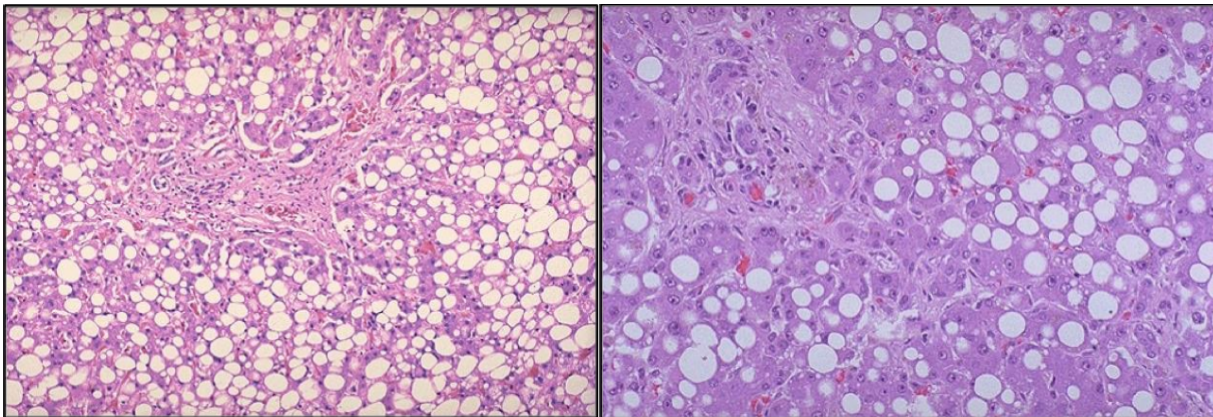
Fatty liver

Normal liver

### Features :

1. Slightly enlarged.
2. Pale yellow appearance.
3. Greasy.

### Histological appearance



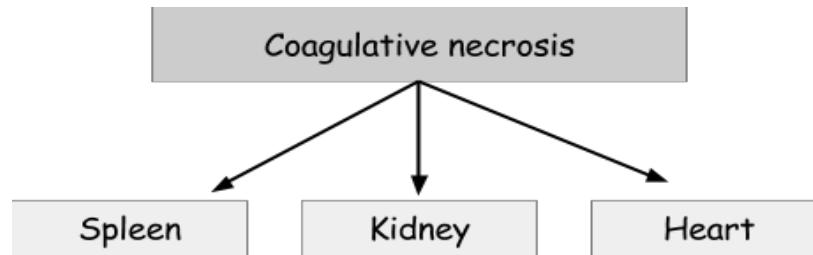
### **Features:**

1. Lipid accumulation as vacuoles in the hepatocytes.
2. Displacement of the nuclei to the periphery.

We can detect fatty liver by H & E stains.

**Common Cause:** alcoholism.

## Case 2: coagulative necrosis



### 1) Organ: Kidney

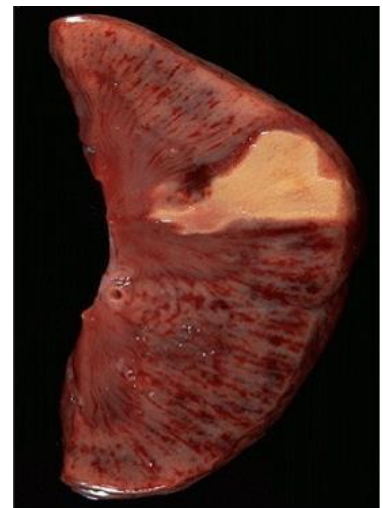
#### Gross appearance:

##### Feature:

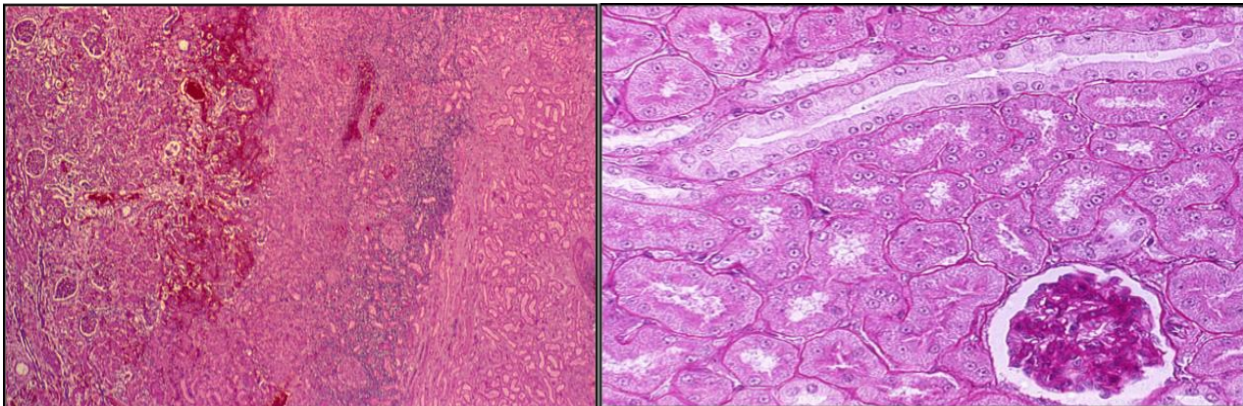
- 1) Wedge-shaped pale area of coagulative necrosis in the renal cortex.

##### Cause:

Obstruction to the artery will lead to Ischemia.



#### Histological appearance:



##### Features:

- Coagulative necrosis of glomeruli, tubules and interstitial tissue.
- loss of cell nuclei
- Dilated and congested blood vessels at the hemorrhagic zone.
- inflammatory cells (blue area)

Also, Brush border is seen in the right picture, using PAS stain .

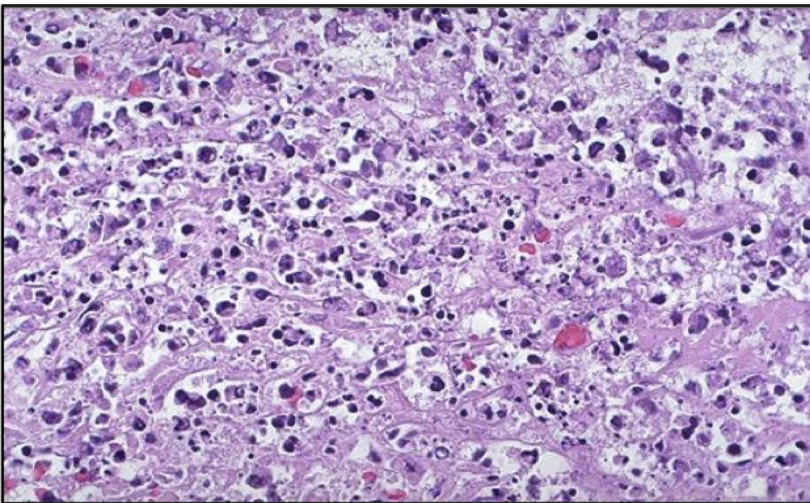


## 2) Organ: spleen



Two large infarctions (areas of coagulative necrosis) are seen in this sectioned spleen.

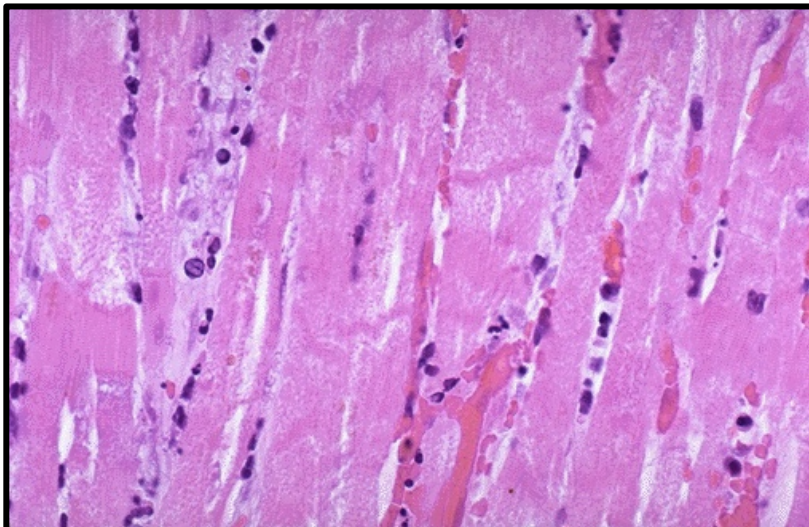
## 3) myocardium cells



### Features:

- 1) many nuclei undergo: **Pyknotic** → **karyorrhexis** → **karyolysis**
- 2) The cytoplasm and cell borders are not recognizable.
- 3) inflammatory cells can be seen (neutrophils)
- 4) ***The nuclei of the myocardial fibers are being lost.***

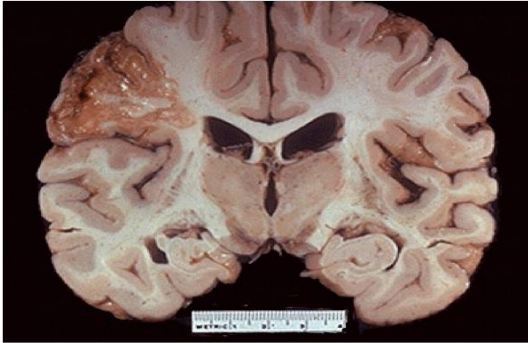
***The cytoplasm is losing its structure, because no well-defined cross-striations are seen.(2#)***





## Case 3: Liquefactive necrosis

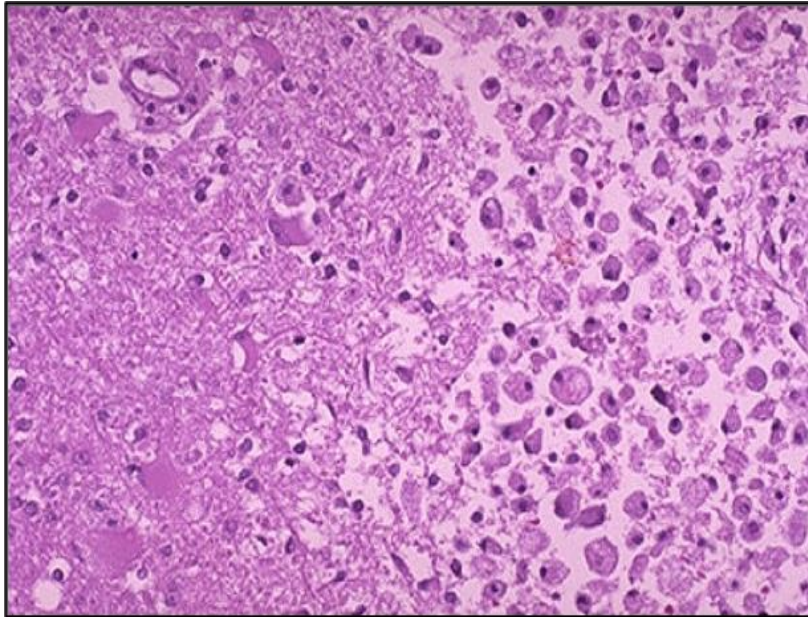
### 1) In the Brain



#### Features:

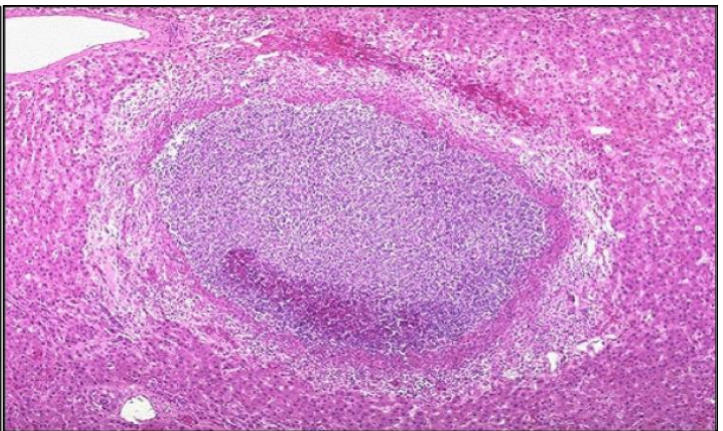
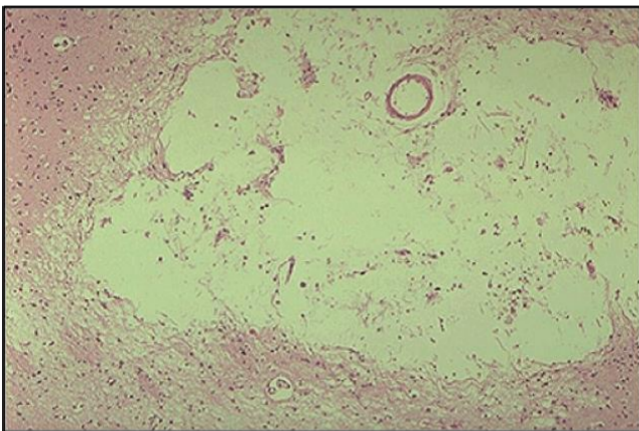
1) Liquefactive necrosis in brain leads to resolution with cystic spaces

#### Histological appearances:



Presence of macrophages at the right that are cleaning up the lipid debris of the necrosis.

2) **In the liver:**



Localized liquefactive necrosis which form a small abscess filled with many neutrophils.



## Case 4: Caseous Necrosis

Organ: **Lung**

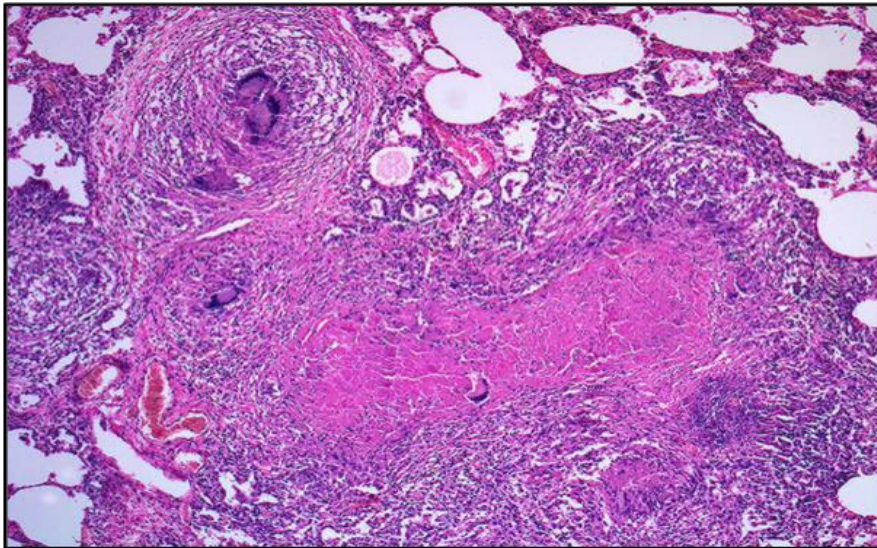
Disease: **TB (tuberculosis)**

### Gross appearance:



Apical lesion with caseous necrosis and cavitation this large area contain yellow-white and cheesy debris.

### Histological appearance:



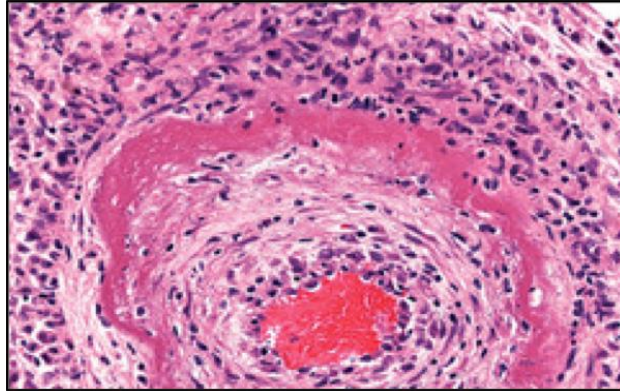
### Features:

- 1) Caseating granuloma with giant cells and caseous necrosis.
- 2) Langhan's giant cells
- 3) epithelioid cells
- 4) rim of lymphocytes



## Case 5: Fibrinoid necrosis

Organ: **artery**



Features:

- 1) pink area of necrosis at the wall of the artery
- 2) Neutrophils with dark nuclei also at the wall of the artery.

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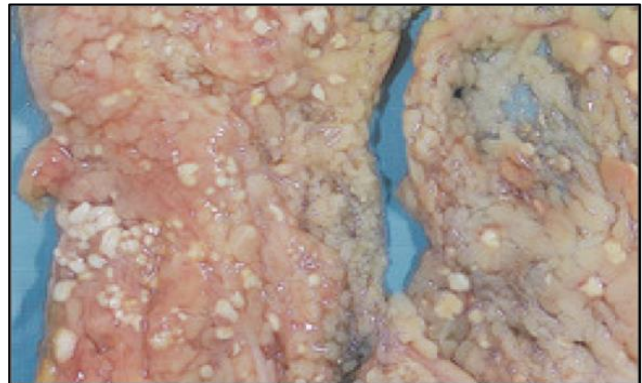
## Case 6: Fat necrosis

**Gross appearance:**

Site: **mesentery**<sup>1</sup>.

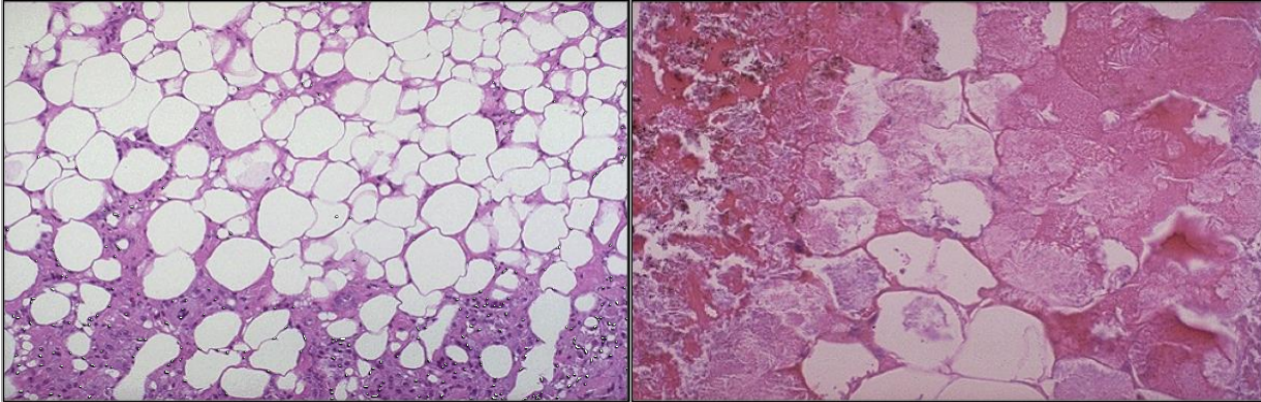
**Features:**

- 1) white chalky deposits of fat necrosis With calcium formation ( saponification)
- 2) the second picture shows fat necrosis in the case of acute pancreatitis.



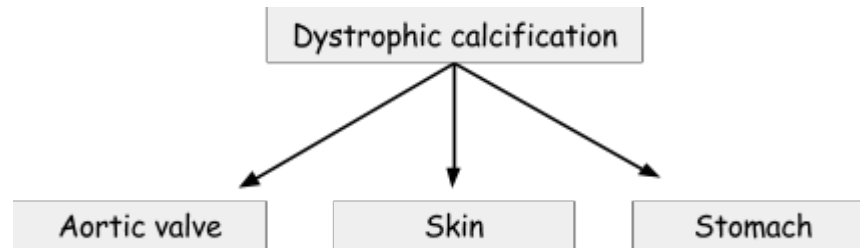
<sup>1</sup> a fold of the peritoneum that attaches the stomach, small intestine, pancreas, spleen, and other organs to the posterior wall of the abdomen.

## Histological appearance:



- 1) Vague (not clear) cellular outlines.
- 2) Lost their peripheral nuclei.
- 3) cytoplasm has become a pink amorphous mass of necrotic material

## Case 7: dystrophic calcification

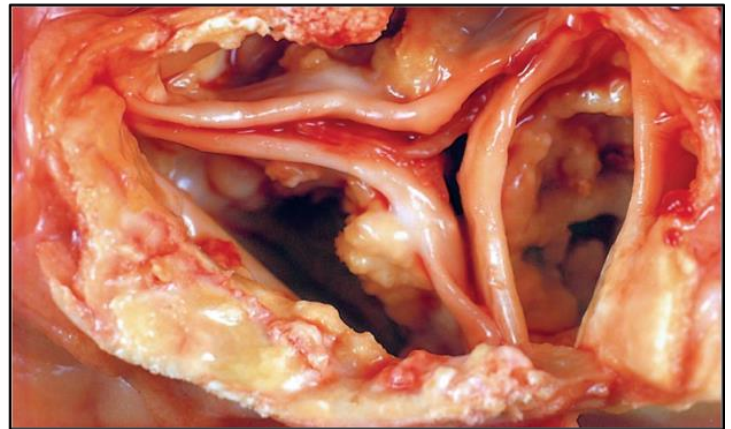


### Aortic valve

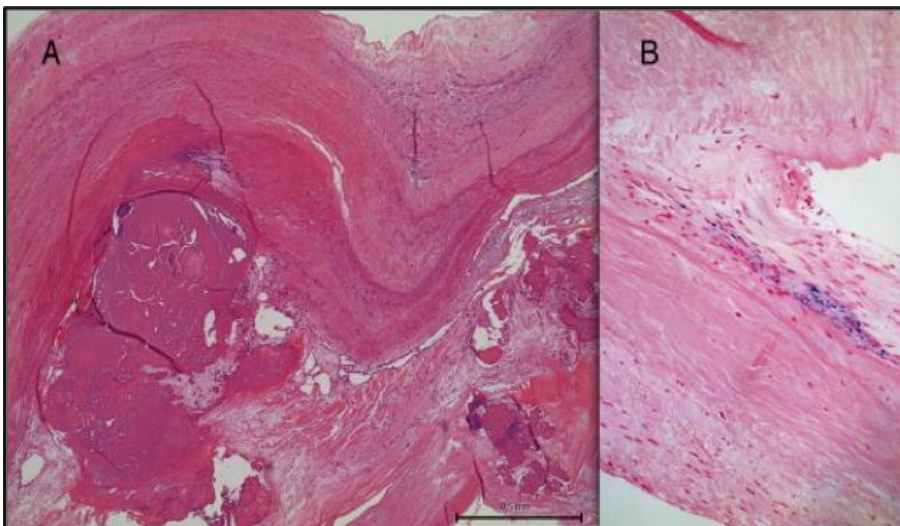
#### Gross appearance

##### Features :

- 1) irregular mass of Ca deposits around the aortic valves of the heart
- 2) the deposits of calcium cause stenosis



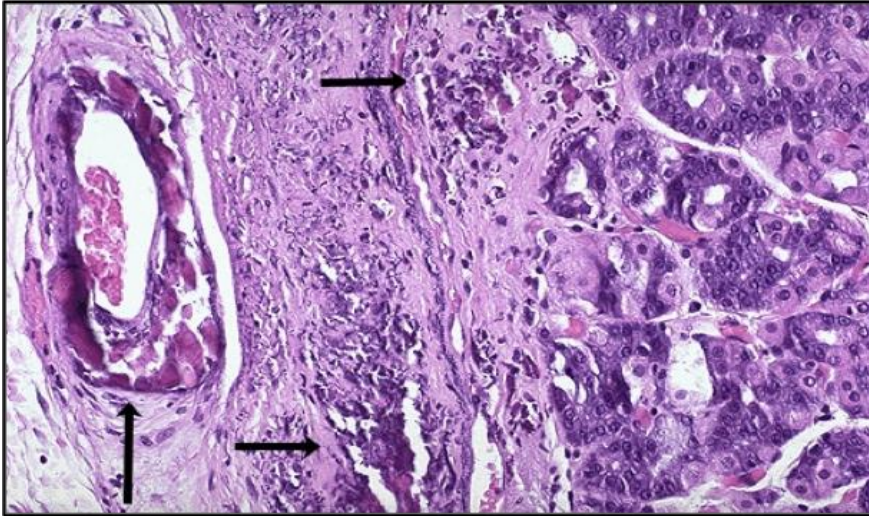
#### Histological appearance :



- 1) calcium depositions
- 2) fibrosis
- 3) inflammatory cells



## Stomach



Features:

- 1) A calcification in the artery wall in the left .
- 2) irregular bluish-purple deposits of calcium in the **submucosa**

## Skin

### Gross appearance:

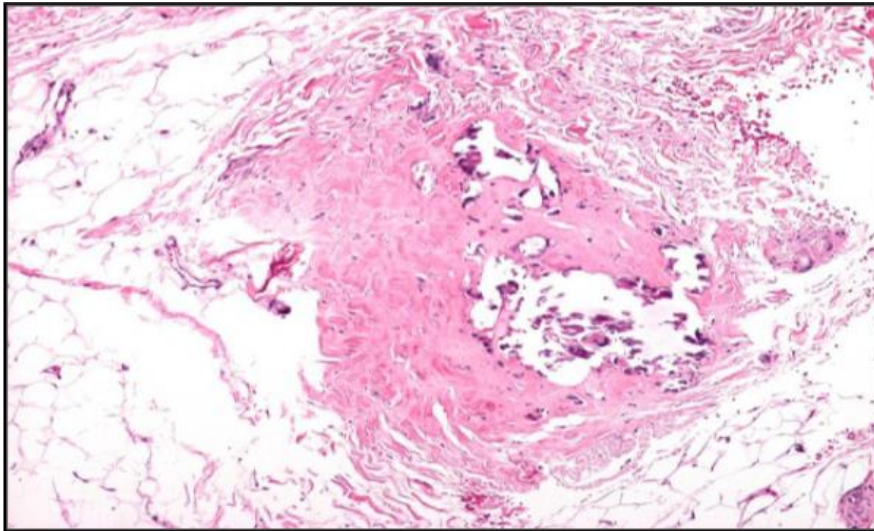
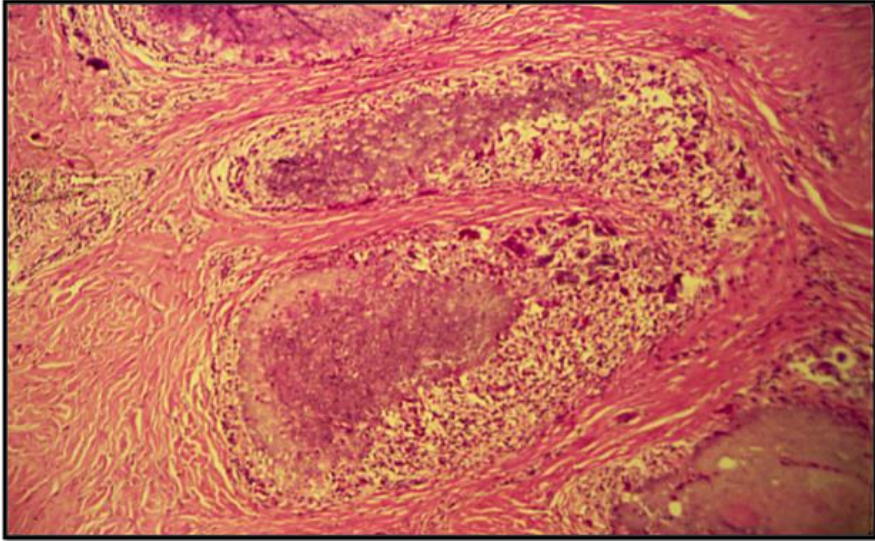


- Multiple erythematous <sup>2</sup>hard papules in the arm.
- Lesion <sup>3</sup>with white calcification.

<sup>2</sup> redness of the skin or mucous membranes, caused by hyperemia of superficial capillaries.

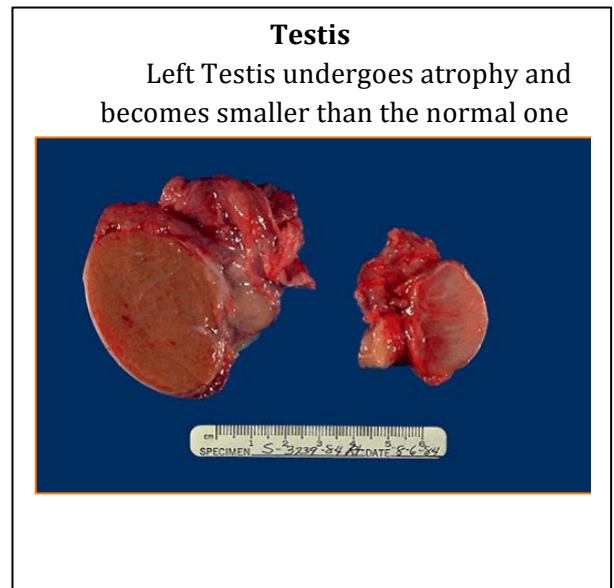
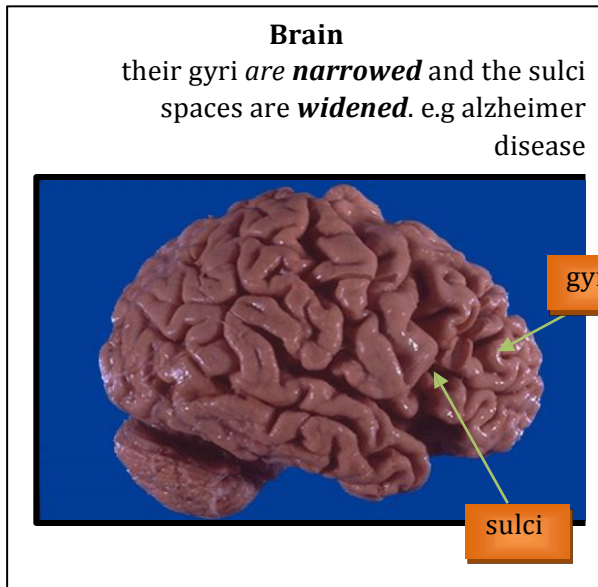
<sup>3</sup> a region in an organ or tissue that has suffered damage through injury or disease, such as a wound, ulcer, abscess, tumor, etc..

## Histological appearance:



- 1) irregular blue granular deposits of calcium in the dermis.
- 2) the calcium surrounded by fibrous tissue and for foreign body giant cell

## Case 8 : Atrophy of Organs



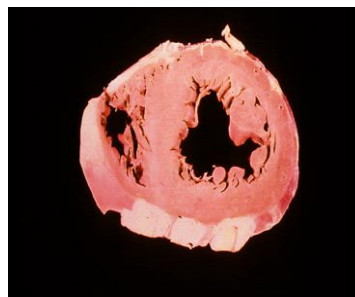
## Case 9: Left Ventricular Hypertrophy

Patients with severe **hypertensive** increase the workload on the left ventricle of the heart, therefore **the left ventricle undergoes hypertrophy**.

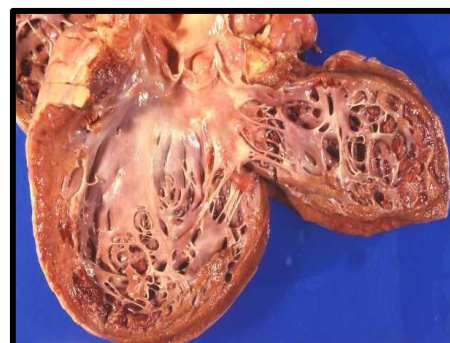
They do increase in size (hypertrophy) when there's an increased workload.



**Left ventricular hypertrophy**



**Normal ventricle**



**Features:** hypertrophy of the left ventricle



## Case 10: Prostatic Hyperplasia

### Gross:

Patients with prostatic hyperplasia have their prostate glands and stroma (connective tissue) are increased which causes the enlargement of the prostate.

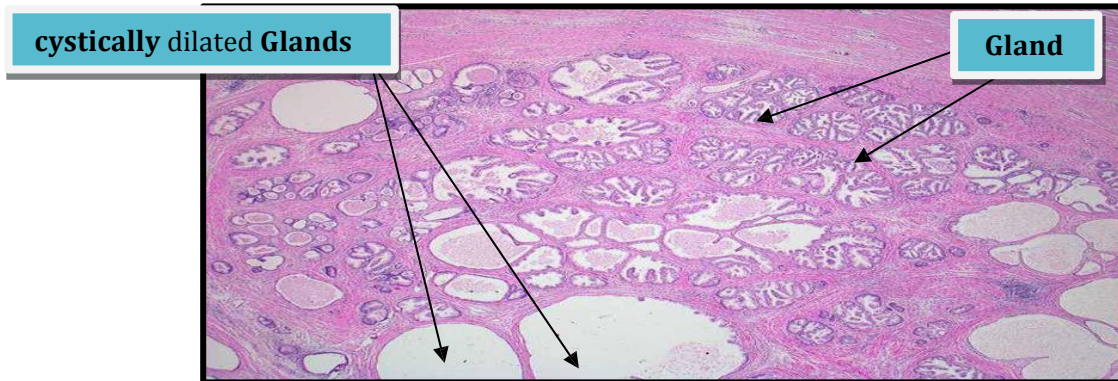


Prostatic hyperplasia

### Histological appearance:

#### Features:

1- many glands 2- lined by tall columnar epithelium and basal layer 3- some glands are cystically dilated



Nodule of prostatic hyperplasia

4- intervening stroma 5- corpora anaplasia is present in some glands



Nodule of prostatic hyperplasia

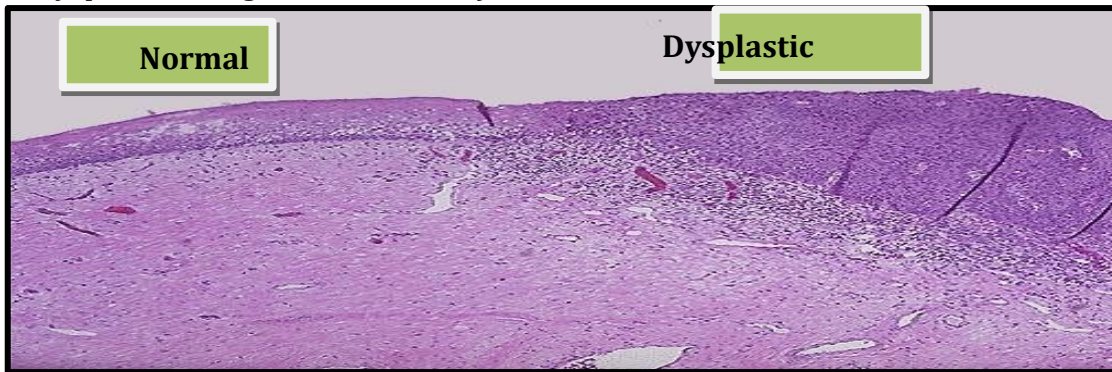
## Case 11: Squamous Metaplasia and Dysplasia



Normal Uterine Cervix

### Histological appearance:

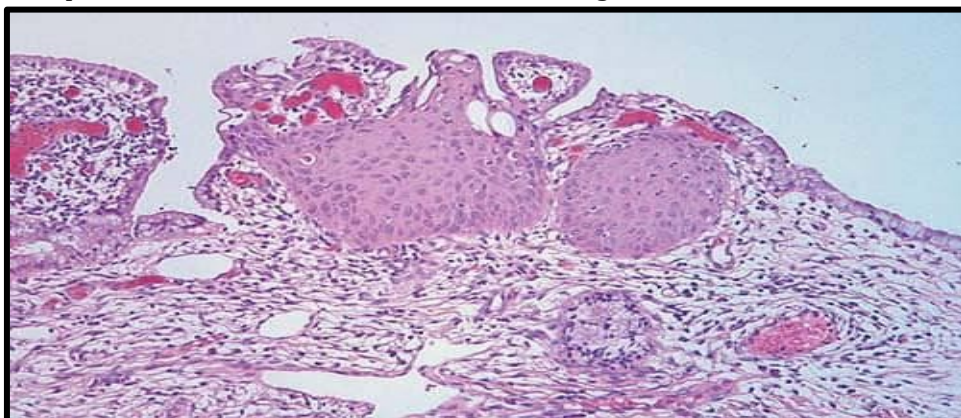
The normal cervical has a *squamous epithelium* as you can see on the right while the left side is gone *dysplastic changes due chronic inflammation.*



### Endocervical Squamous Metaplasia

#### Features:

squamous metaplasia in the center and columnar at the edges

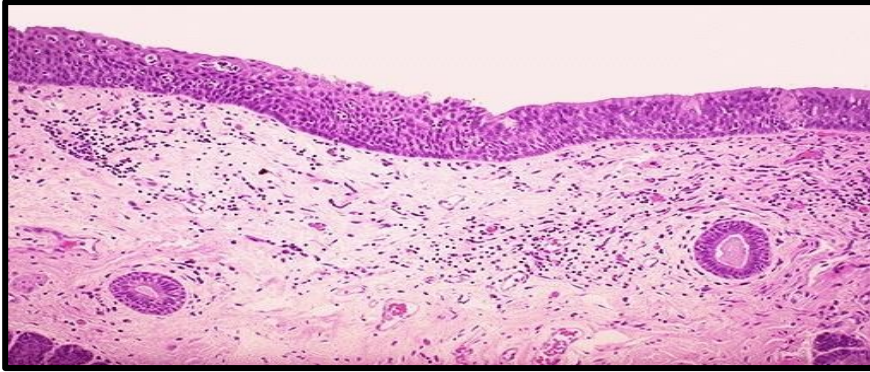




## Laryngeal Squamous Metaplasia:

### Features:

2- squamous metaplasia of epithelium



## Case 12: Fibrinous Pericarditis

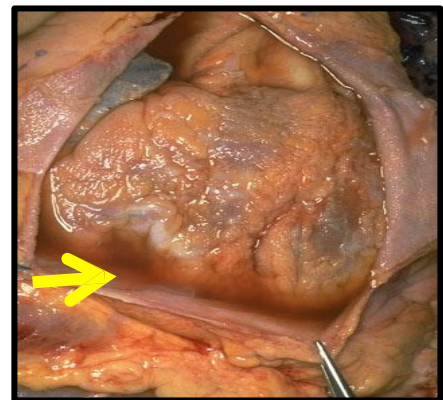
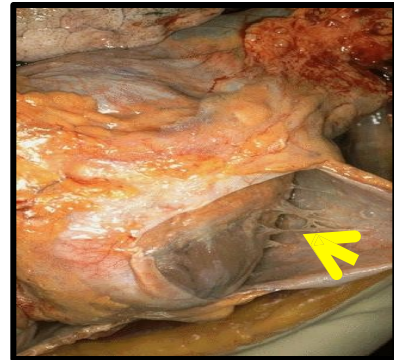
### Gross:

*the fibrinous pericarditis*

*Connected to the visceral by strands of stringy pale fibrin.*

### Features:

- 1- serous fluid at the bottom of the pericardial cavity
- 2- the epicardial (outer layer of the heart) appears rough due the strands of pink-tan fibrin that have formed
3. pale fibrin in the pericardium.

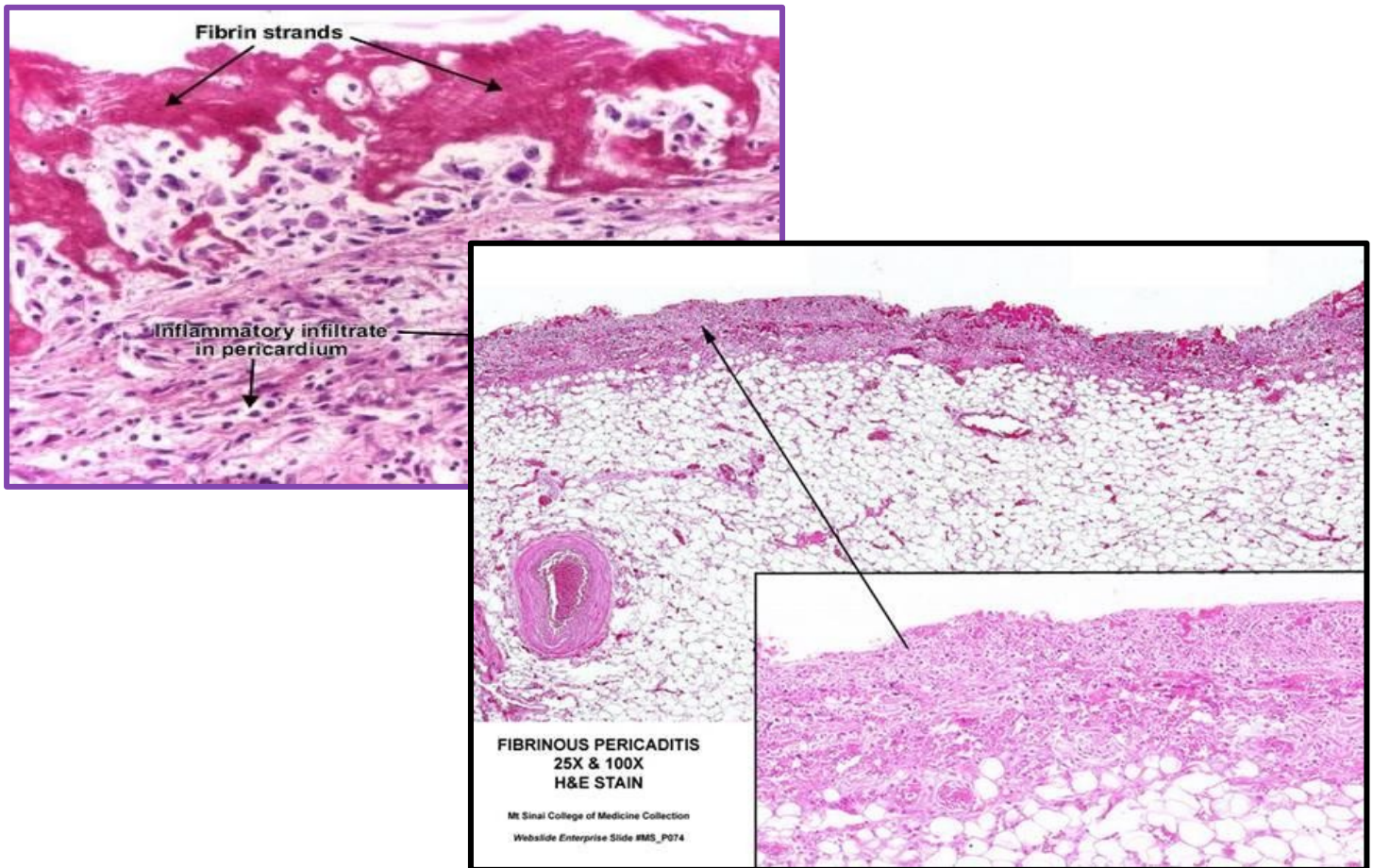




## Microscopically:

### Features:

- 1- thick irregular layer of pinkish fibrinous exudate
- 2- red cells and inflammatory cells.
- 3- trapped erythrocyte
- 4- dilated blood vessels
- 5- chronic inflammatory cells and areas of calcification



## Case 13: Acute Appendicitis

### Gross appearance:

### Features:

- 1- yellow exudate
- 2- glistening pale tan serosal surface
- 3.

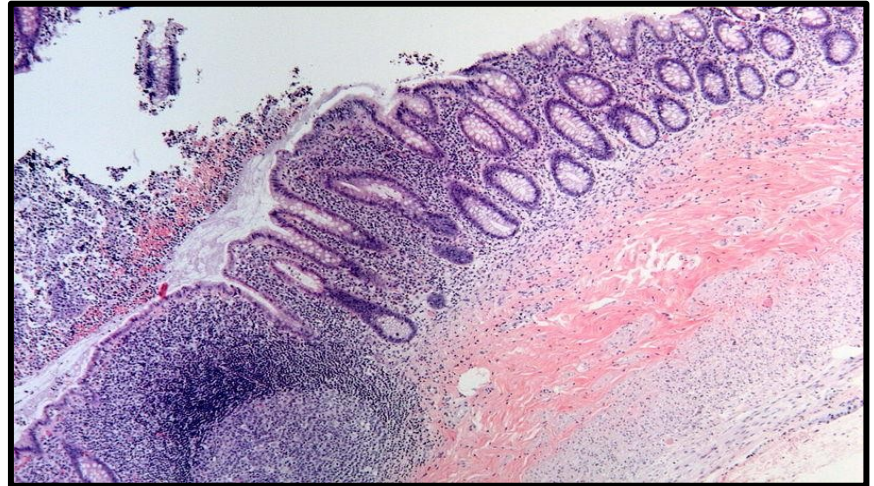




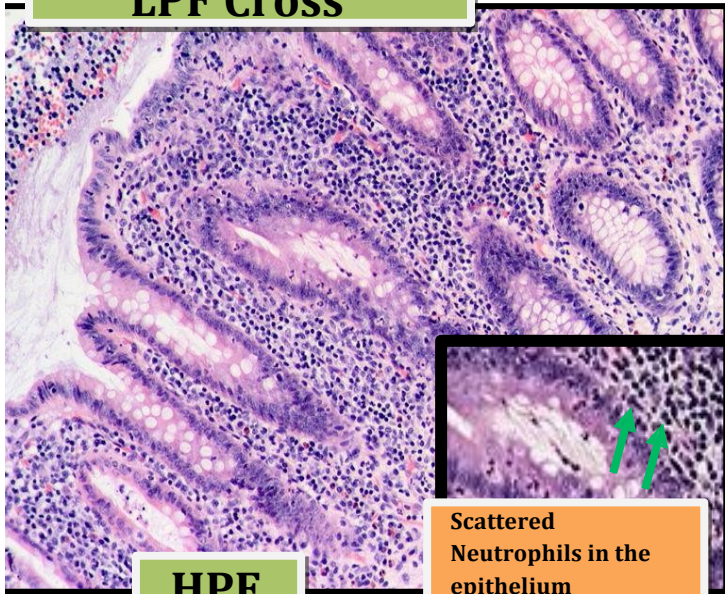
## Longitudinal section:

### Features:

- 1- enlarged organ
- 2- angry red inflamed mucosa



**LPF Cross**

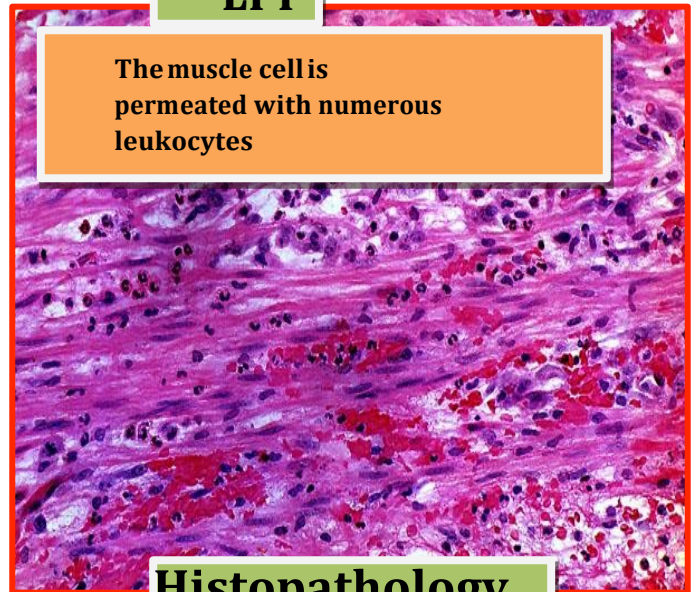


**HPF**

Scattered Neutrophils in the epithelium

**LPF**

The muscle cell is permeated with numerous leukocytes



**Histopathology**

## Case 14: Acute Cholecystitis

*pain and tenderness on palpation on the right upper quadrant abdomen*

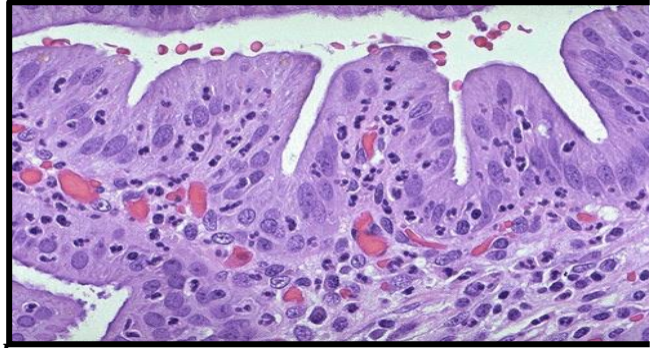
### Gross:

*Distended gall bladder and congested*



### Histopathology HPF:

*1- neutrophils are seen on mucosa and sub mucosa in the gall bladder, and necrosis*



## Case 15 :Foreign Body Reaction (Pilonidal Sinus)

*Pilonidal sinus is a sinus tract which commonly contains hair . it occurs under the skin between the buttocks a short distance above the anus.*







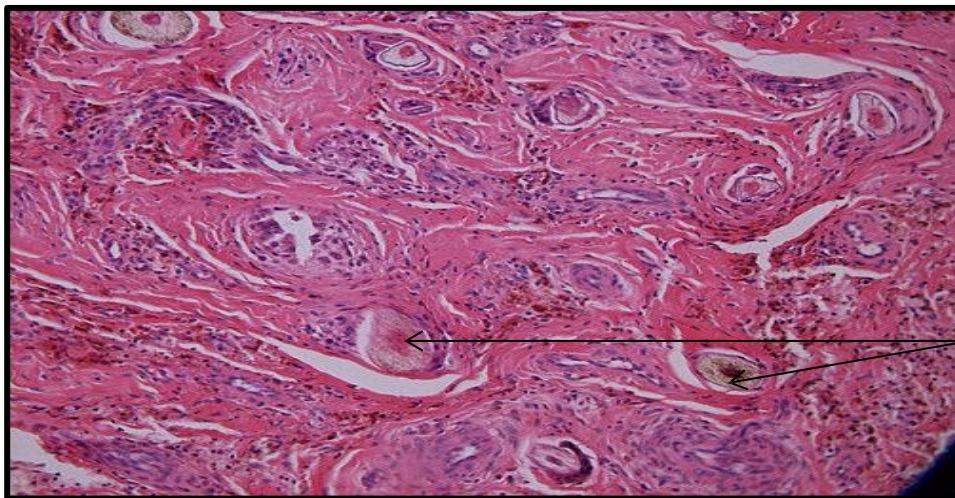
Inflammation in the cocccyal area.

**Gross:** Skin tissue contain sinus track and hair

Organ: Skin

Description: **abnormal mass containing hair within fibrous tissue**

### Histological appearance:



Hair shaft

### Descriptions:

1- Hair follicle 2- Giant cell 3- Chronic inflammatory cell

### What is the different between sinus and fistula?

- Sinus: is track by one opening close from inside and open from outside
- Fistula: track by two opening

## Case 16: Chronic cholecystitis with Gall Stones



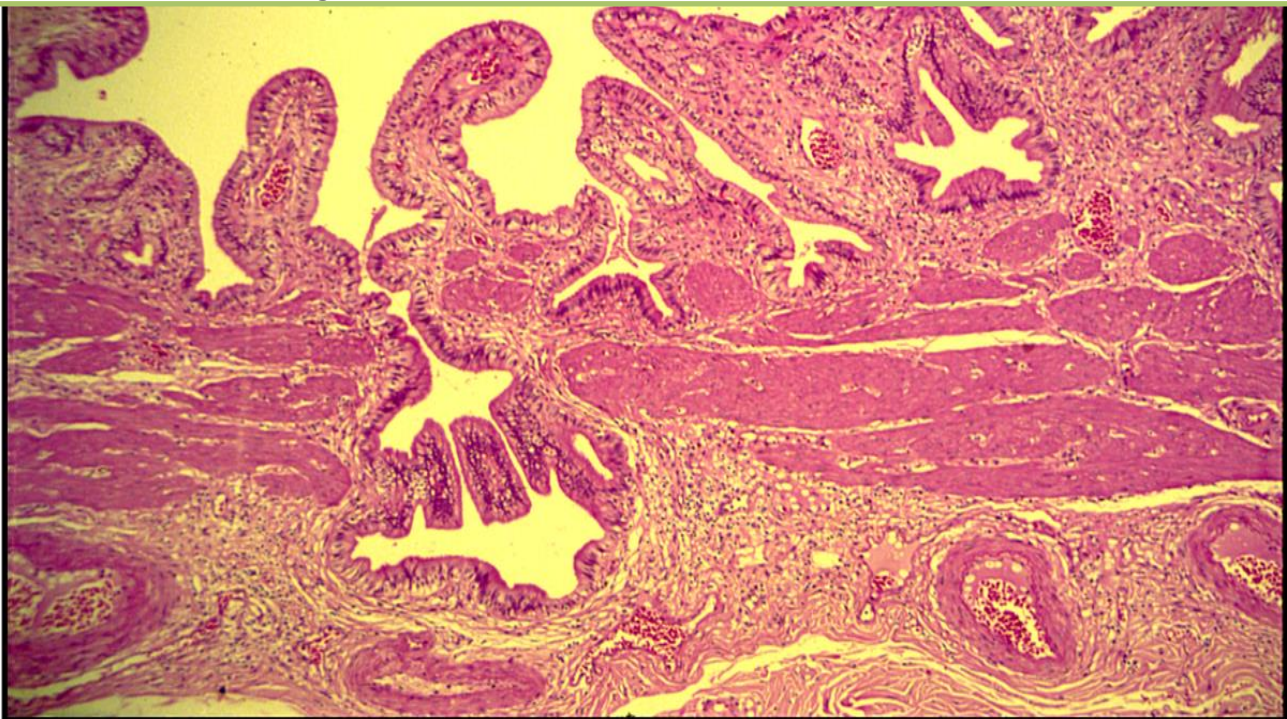
Organ: gall bladder.

Description: multiple yellowish stones within cavity of gall bladder.  
Gall bladder contained a numerous stones.

Wall is penetrated by mucosal glands which are present in muscle coat ( Rokitansky-Aschoff sinuses). All layers show chronic inflammatory cells infiltration and fibrosis.

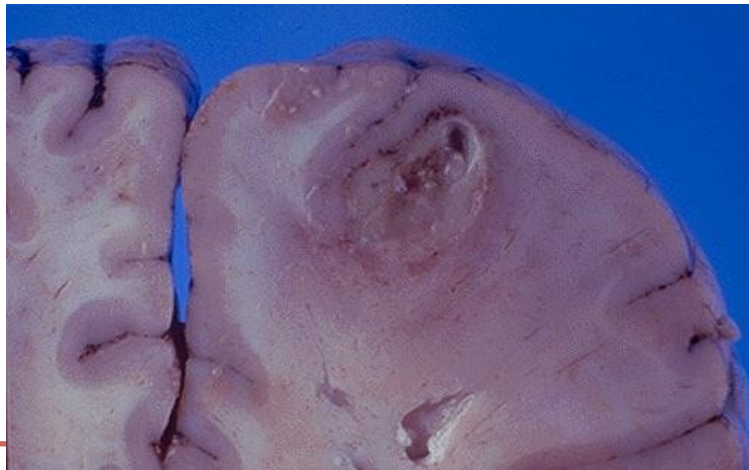
Description:

- 1- mucosal gland present in muscles coat  
"Rokitansky- Aschoff sinuses"
- 2- inflammatory cell
- 3- fibrosis and congested of blood vessels





## Case 17: Brain Abscess - CT (liquefactive necrotic)

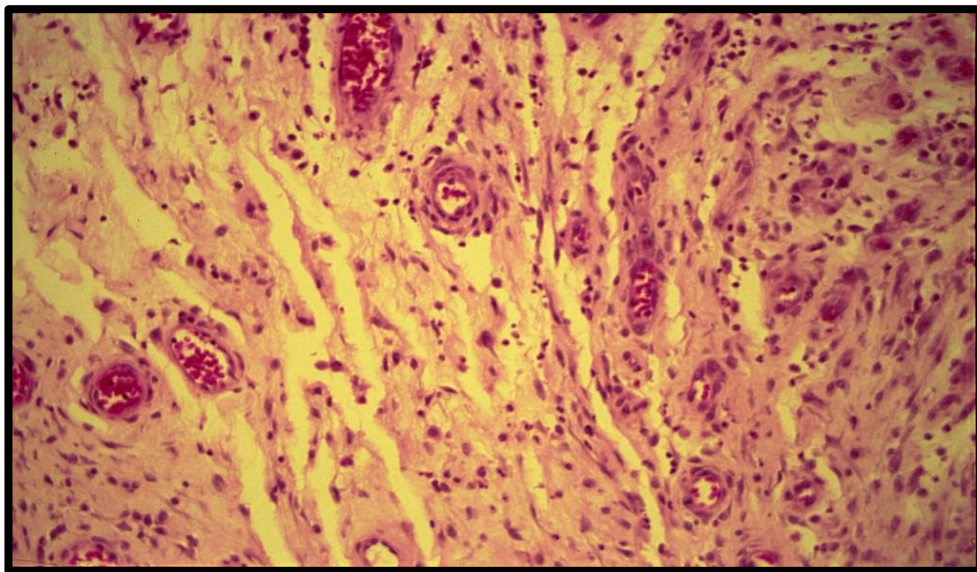


Abscess: neutrophil cell or dead tissue inside cavity which is lined by white capsule.

Description:

- 1- Abscess cavity with a white capsule contain liquefactive necrosis.
- 2- Normal brain.
- 3- connective tissue capsule.

## Case 18: Granulation Tissue

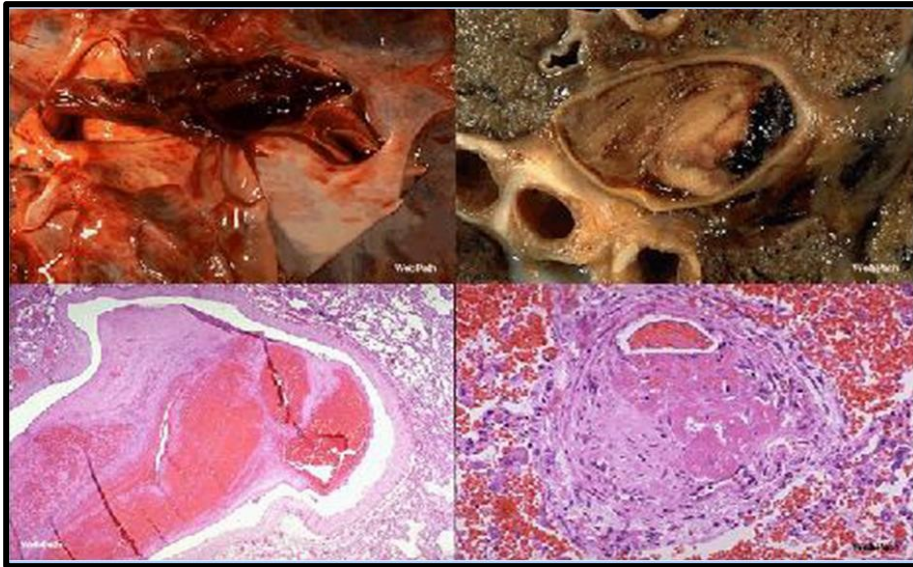


Description:

- 1- new capillaries of blood vessel.**
- 2- Proliferation of fibroblast cells.**
- 3- inflammatory cells.**



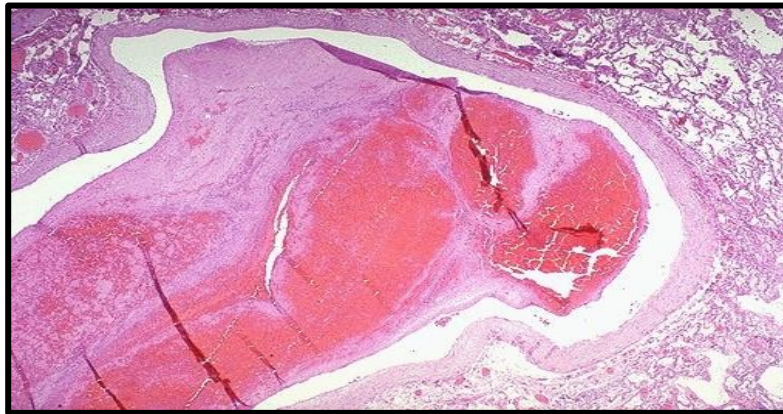
## Case 19: Organizing Thrombus



Organ: **Pulmonary Artery.**

Organizing thrombus in a case of pulmonary embolism.

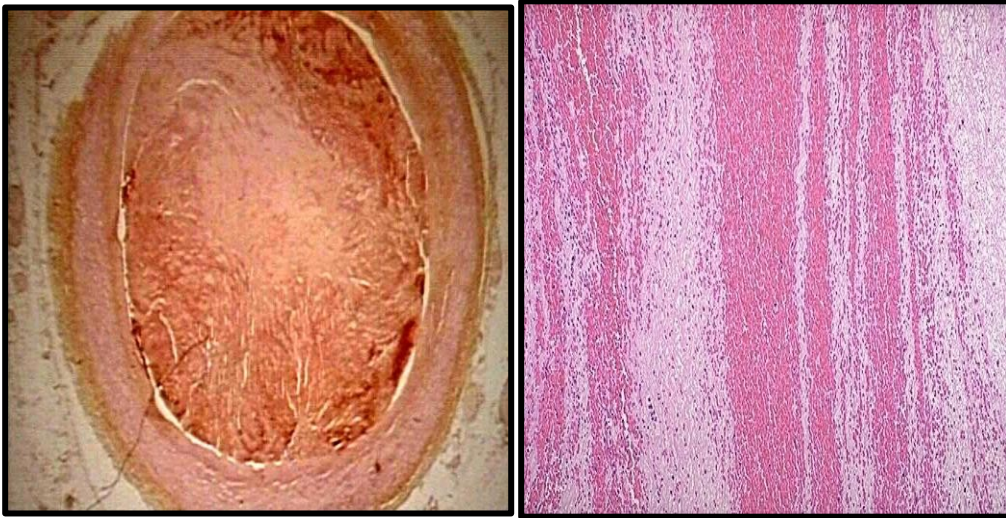
### *Organizing Thrombus with Lines of Zahn*



This is the microscopic appearance of a pulmonary thromboembolus in a large pulmonary artery.

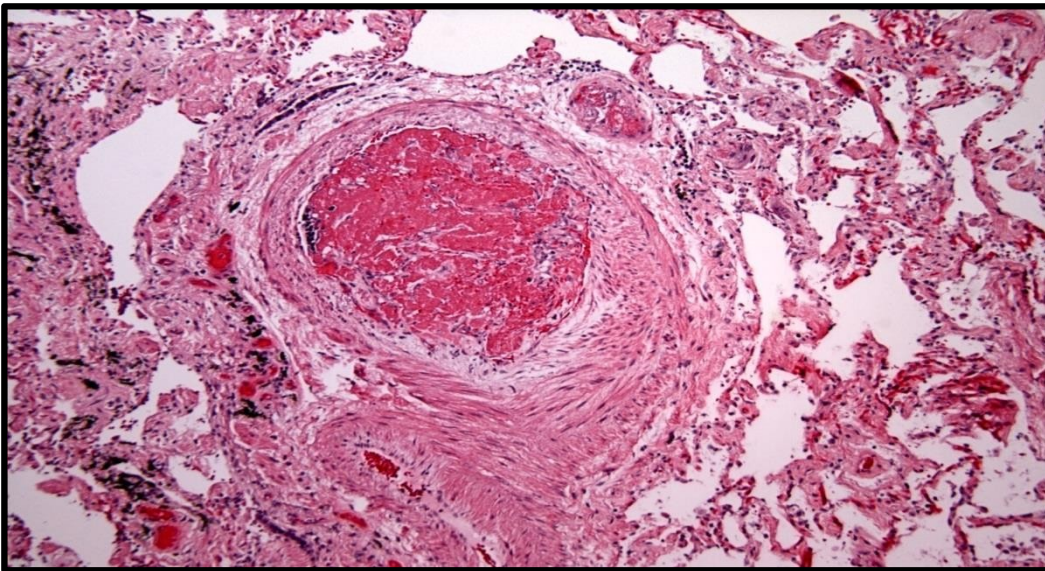
There are interdigitating areas of pale pink and red that form the "lines of Zahn".

### *Lines of Zahn*



#### **Lines Of Zahn:**

- 1- RBCs or inflammatory cells
- 2- Fibrin
- 3- platelets.



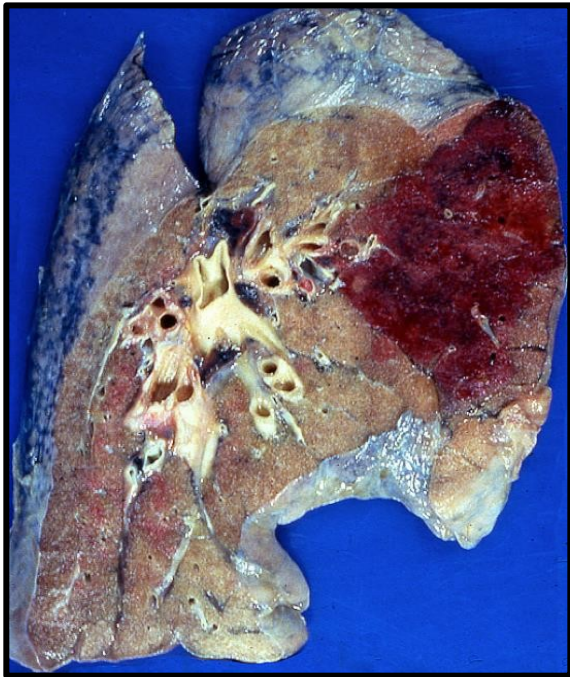
Organ: complete obstruction in pulmonary artery.

Description of this picture:

Pulmonary artery with a organizing thrombus composed of fibrin , platelet and inflammatory cells .



## Case 20: Pulmonary Embolus with Infarction



### Description:

1-triangular coagulative necrosis of lung with presence of thrombus at the apex

### Another Description:

There is pulmonary artery occluded lead to large area of lung infarction.



### Description:

Pulmonary artery thromboses lead to dead lung tissue or lung tissue infarction. It's originate in the leg veins or pelvic veins of persons who are immobilized



## Case 21: Myocardial Infarction

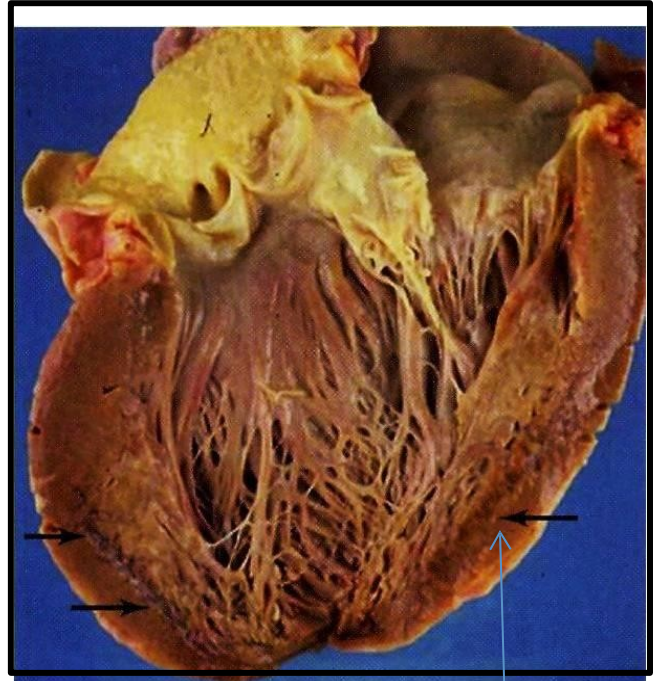
Complications that might occur :

arrhythmias نبض قلب غير منتظم

,ventricular aneurysm ( انتفاخ او زيادة )

( في حجم القلب ) rupture of myocardium,

cardiac tamponed (hemorrhage in the pericardium lead to restricted) and others.



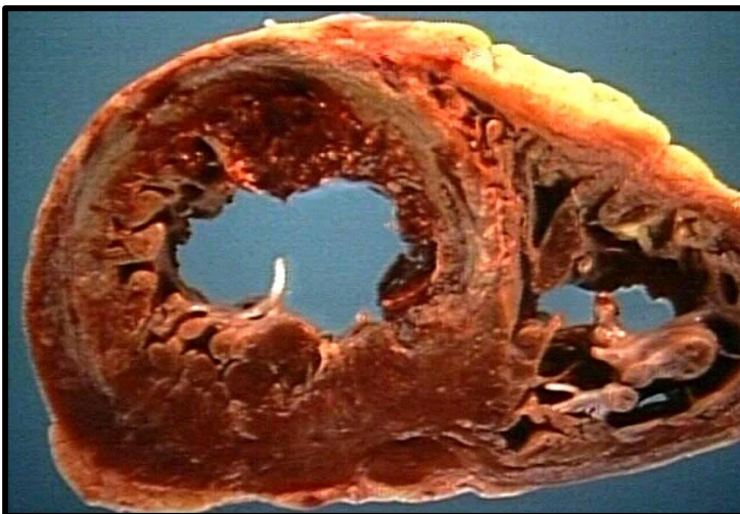
It is a pale area which is early infarction

- Organ:

Left and right ventricles (cross section).

- Description:

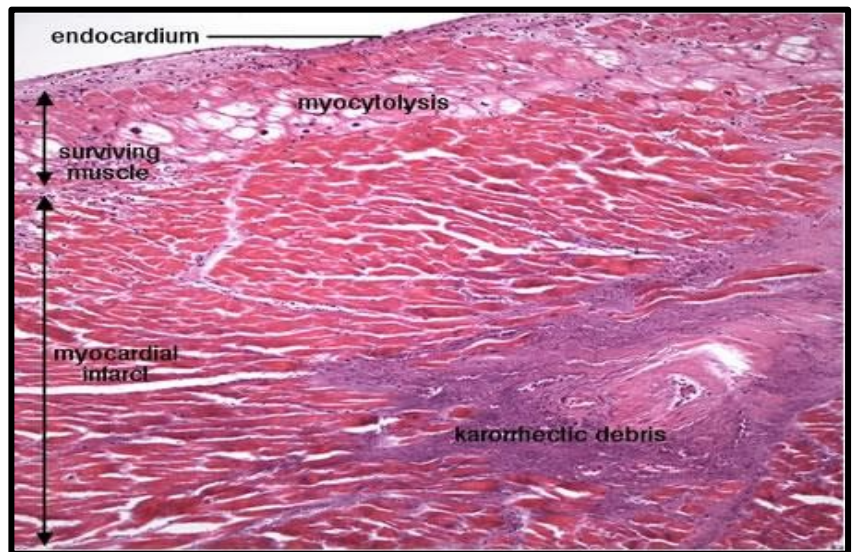
This shows a pale and irregular large area of fibrosis in the left ventricular wall with increased thickness.





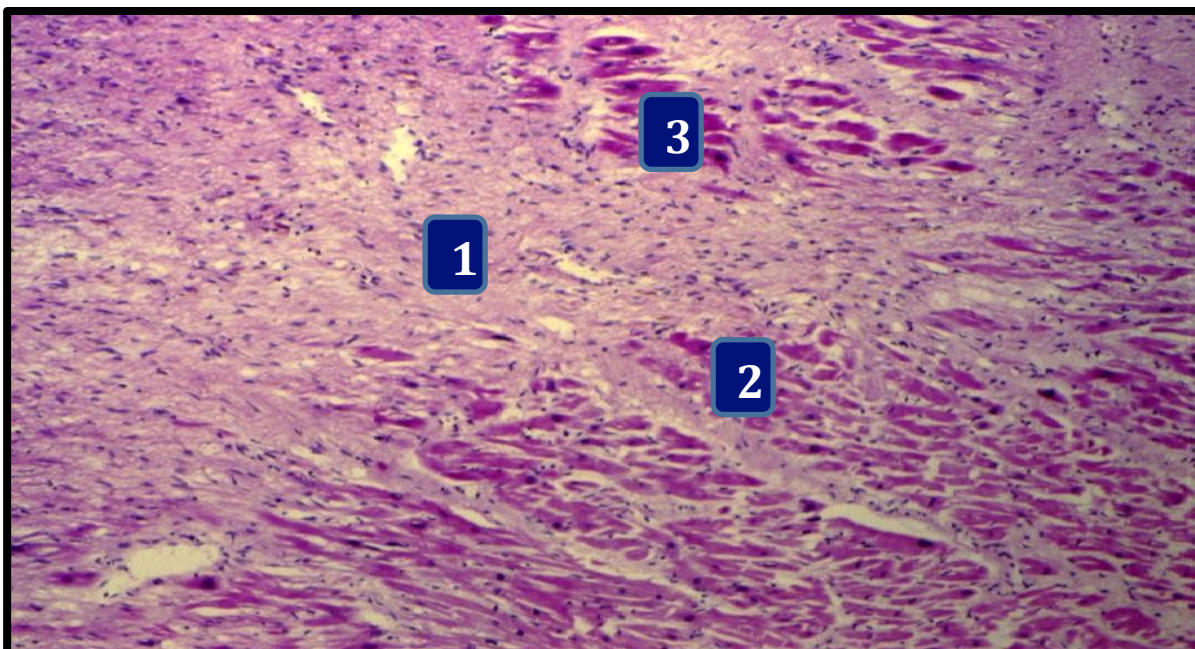
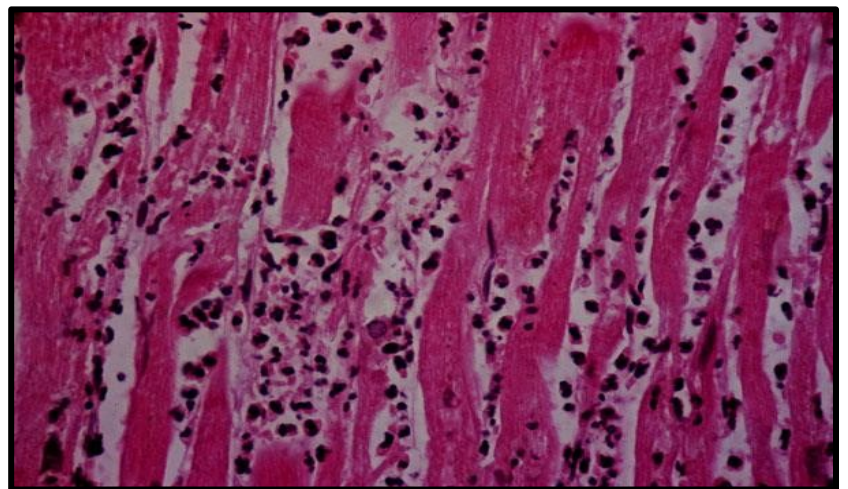
(Early stage and middle stage)

- *Loss of cross striations.*
- *Loss of nucleus*
- *Debris of necrotic tissue*
- *Neutrophil ( picture 2)*



Picture #3: (the late stage)

- 1) Necrosis
- 2) Fibrosis and scar formation
- 3) Hypertrophied muscle

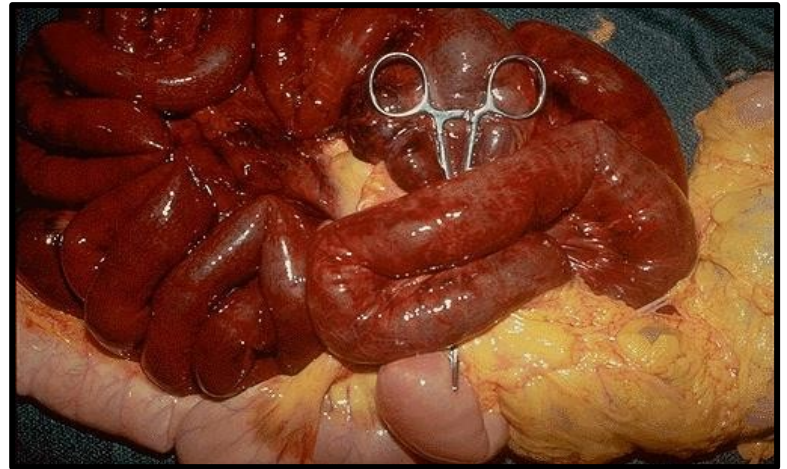




## Case 22: Infarction of the small intestine

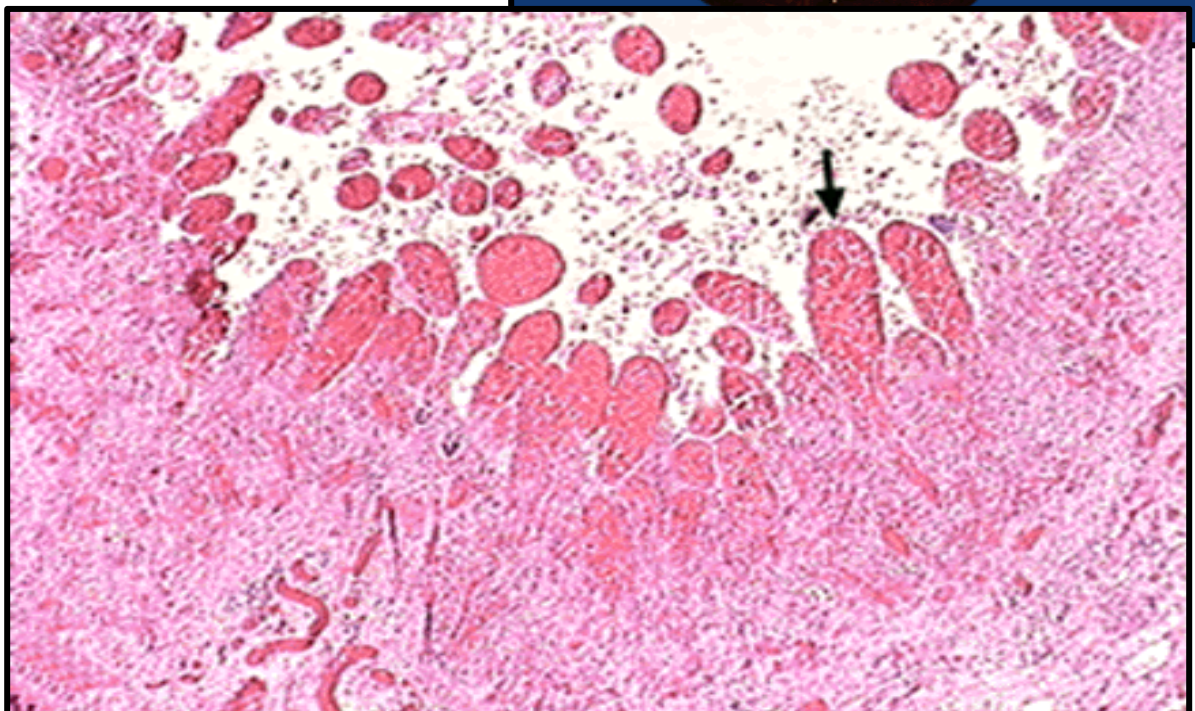
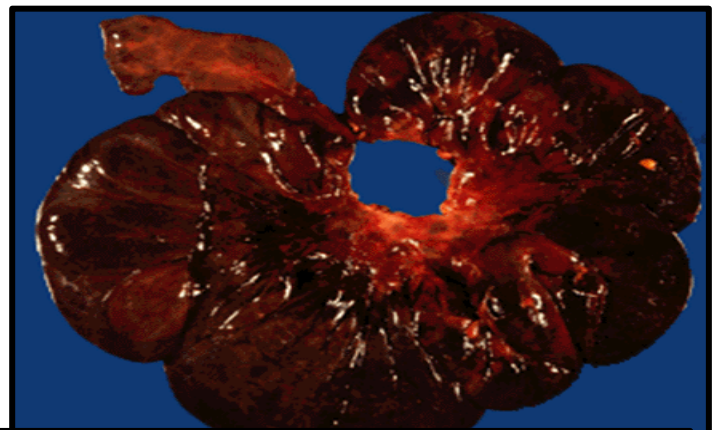
### Gross appearance:

- Dark red Infarcted small intestine.
- The cause is a complication of adhesions from previous surgery.



### Histological appearance:

- Loss of the mucosal epithelium.
- Large area of hemorrhage of the villi
- Inflammatory cells is present.





## Case 23: Tuberculosis of the lung

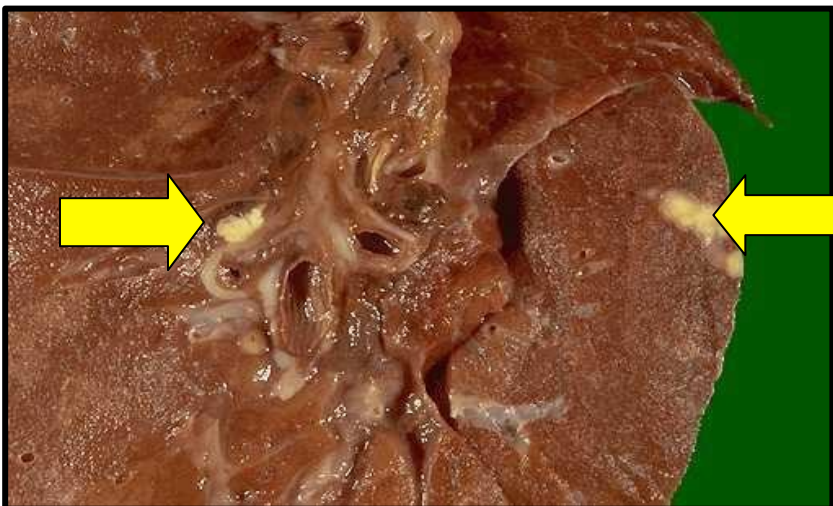
### Symptoms of tuberculosis:

- Loss of appetite
- Loss of weight.
- Night sweat
- fever

### Gross appearance :

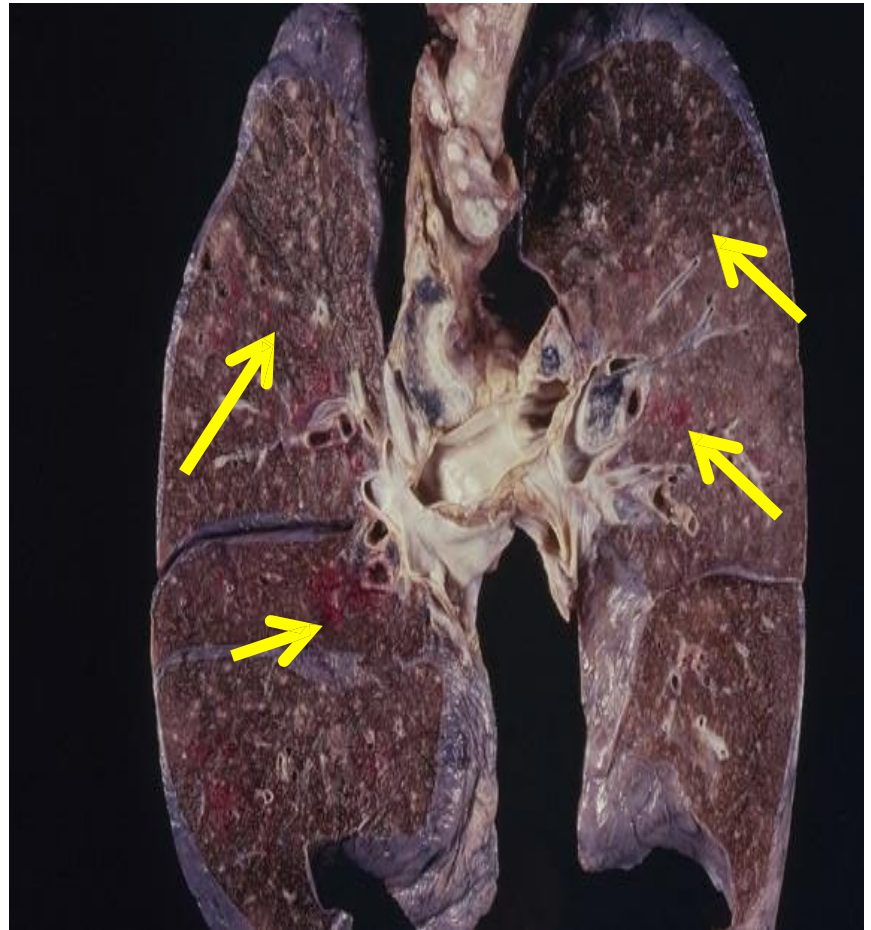
Organ: lung

- Multiple yellowish caseous necrosis
- Apical lesion in the upper part of the lung with cavitation (#2)
- *Ghon's complex when we have the caseous necrosis in the lung and in the lymph node (picture 3) ( the two arrow show that)*

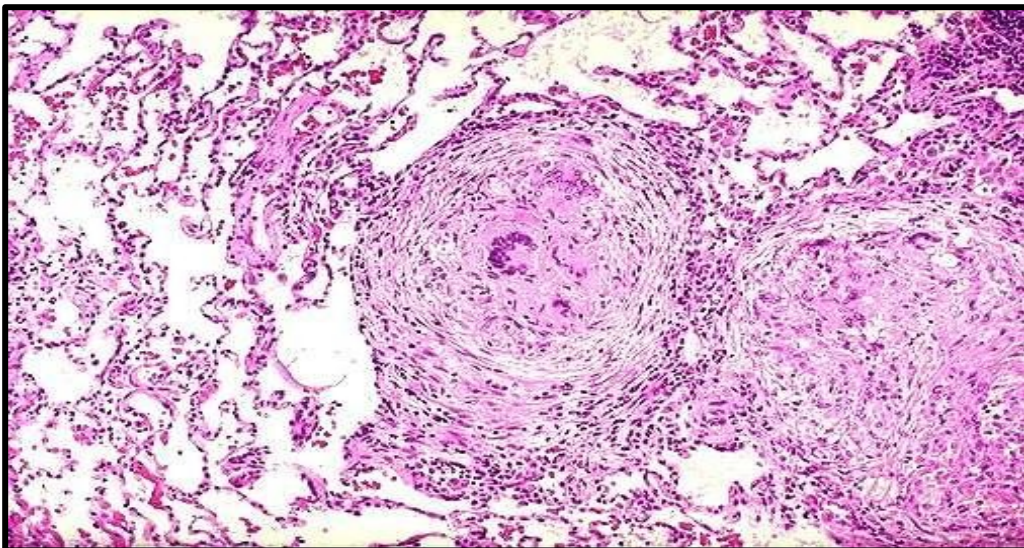


## *Miliary TB of the Lungs*

- TB lesion erode (destroy) the pulmonary vessels or extra pulmonary vessels. (outside the lung)



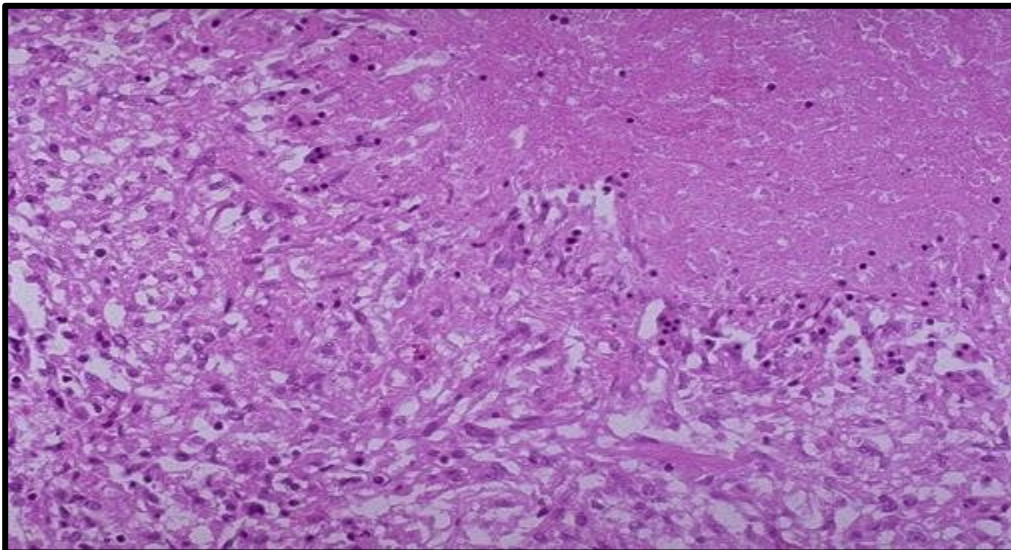
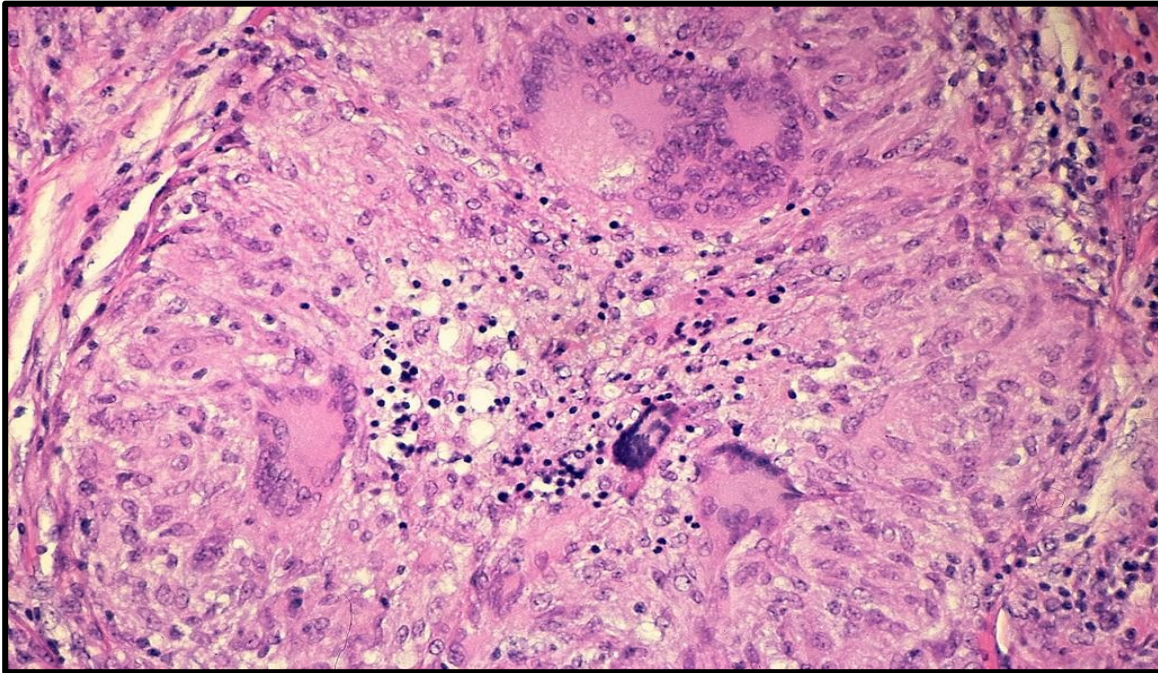
## **Histological appearance:**



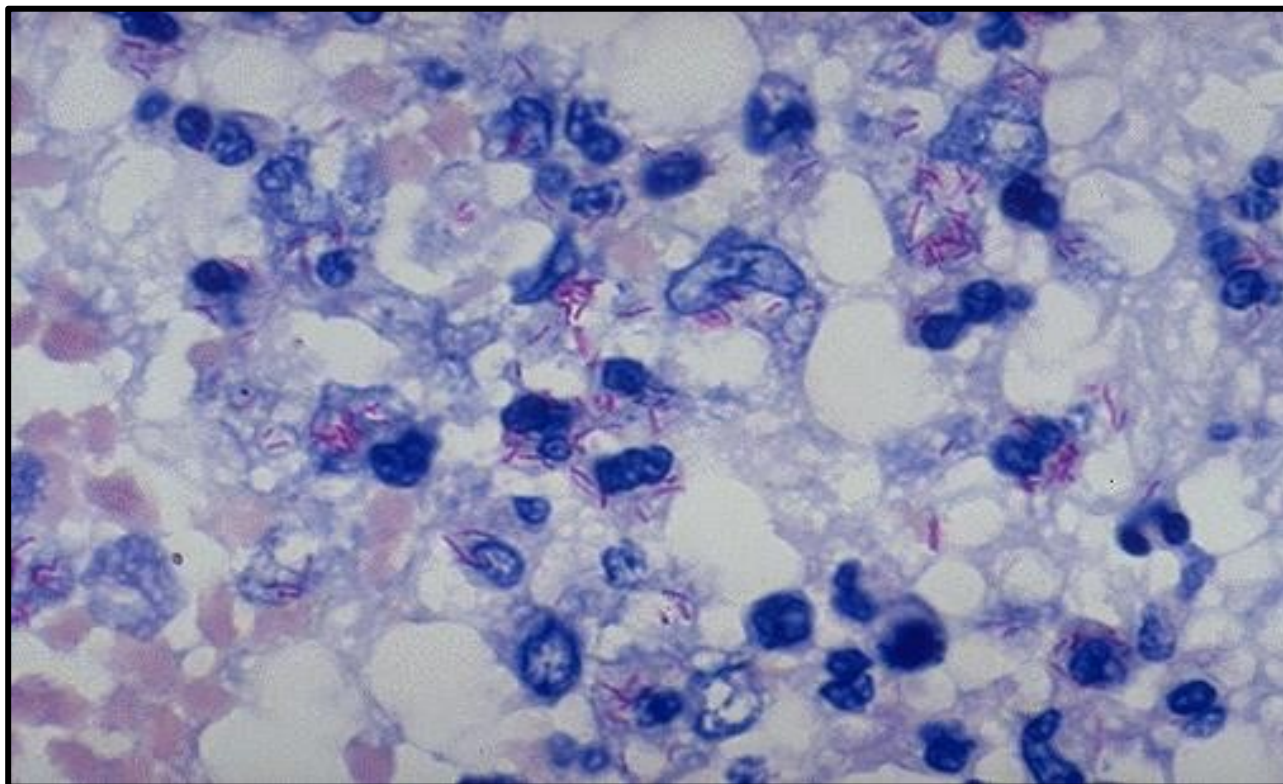


Granuloma is composed of:

- ***epithelioid histocyte in the center.***
- Multiple giant cells is called langhan's cell (horse shoe shape)
- Rim of lymphocyte
- Central caseous necrosis in the center.
- Early necrosis because of pyknotic cells (picture 2)



- Ziehl-Neelsen stain show acid-fast bacilli indicating mycobacterium tuberculosis



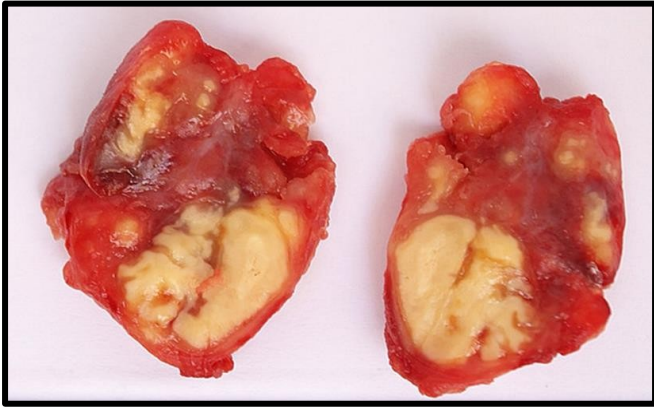


## Case 24: Tuberculous Lymphadenitis

Organ: **Lymph node**

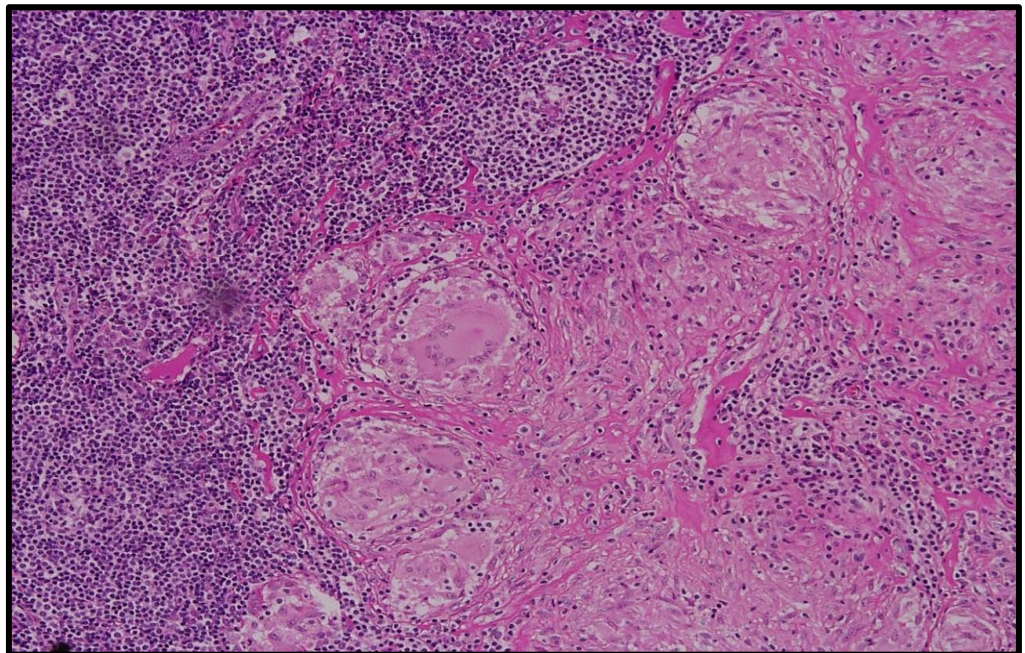
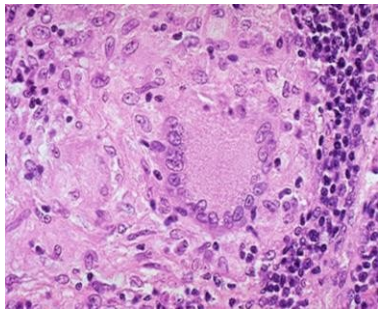
### Gross appearance:

- Area of yellowish caseous necrosis
- Enlarged LN.



### Histological appearance:

Features: it has the same features of TB in the lung (epithelioid and giant cell granuloma)





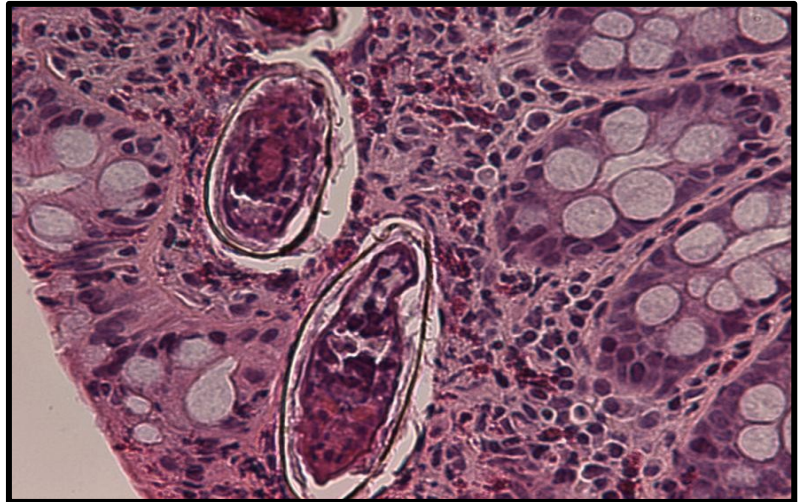
## Case 25: Bilharzial Granulomas

### 1 ) Colonic Bilharziasis

Organ: colon

#### **Histological appearance:**

- Foreign body eggs of *S. mansoni* surrounded by inflammatory cells and fibrosis



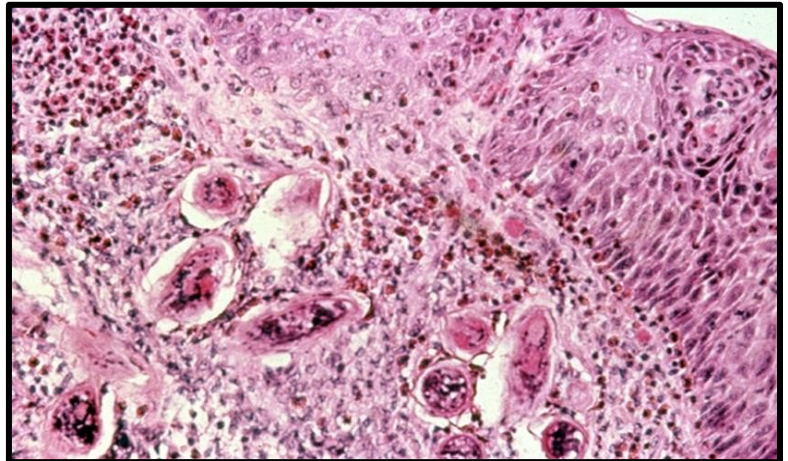
### 2) Bilharziasis of the Urinary Bladder

Organ: Urinary bladder

“ we can see the transitional epithelium “

#### **Histological appearance:**

- Multiple eggs of *Schistosoma* surrounded by inflammatory cells and fibrosis.



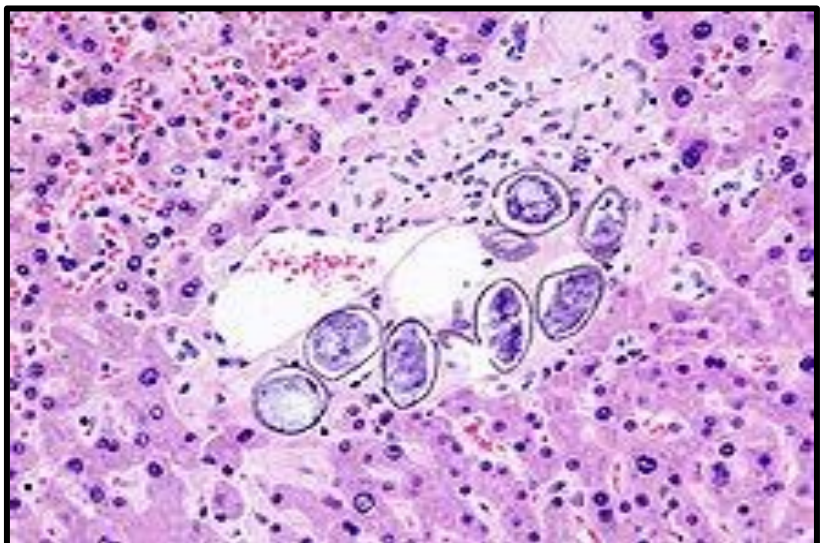
### 3) *S. japonicum* in the Hepatic portal tract

Organ: Liver

“we can see the hepatocyte “

#### **Histological appearance:**

- multiple of *S. japonicum* eggs surrounded by inflammatory cells .





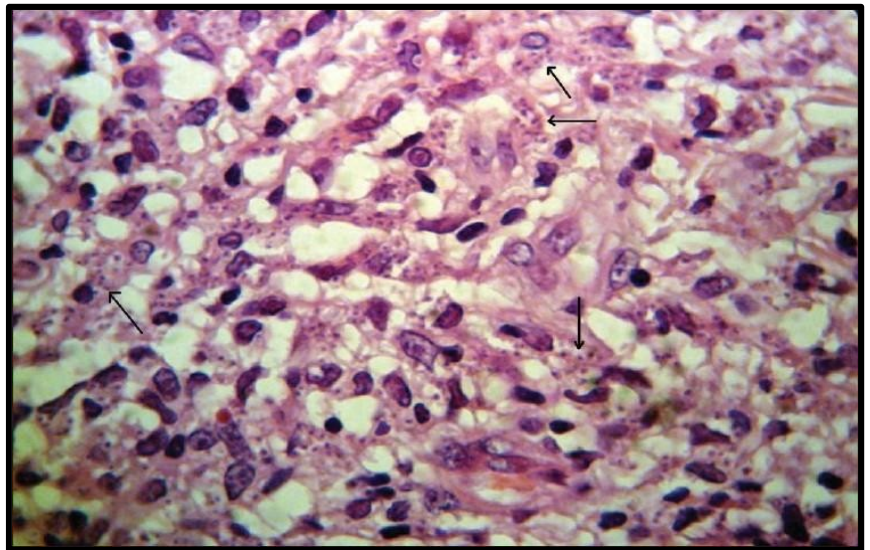
## Case 26: Cutaneous Leishmaniasis



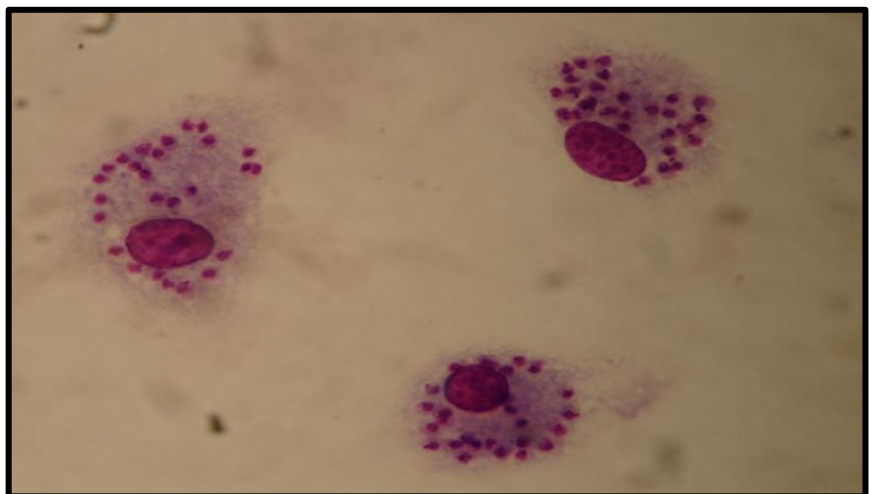
**Gross appearance:** - large oval ulcer in the leg with area hemorrhage.

### **Histological appearance:**

- Many macrophage engulfing the Leishmaniasis bodies ( the small arrows show that)



This is blood smear shows monocyte engulfing the Leishmaniasis bodies.



## Case 27: Adenomatous polyp of the colon



### Gross appearance:

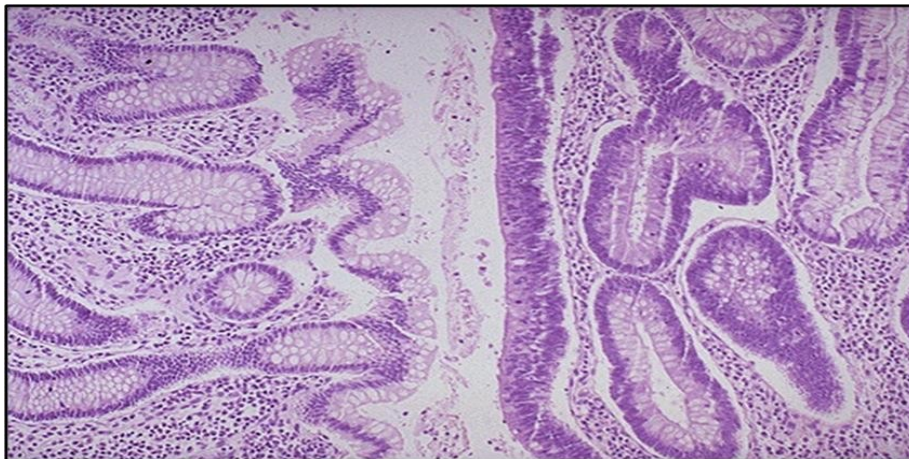
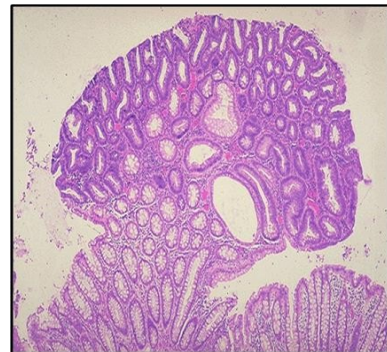
There is a polypoid gross mass arising from the intestinal mucosa with long narrow stalk, it has a hemorrhagic surface (detected with stool occult blood screening) The size of this polyp--above 2 cm--makes the possibility of malignancy more likely, but this polyp proved to be benign.

### Histological appearance:

\* *Normal colonic mucosa on the right. (it's left in the picture)*

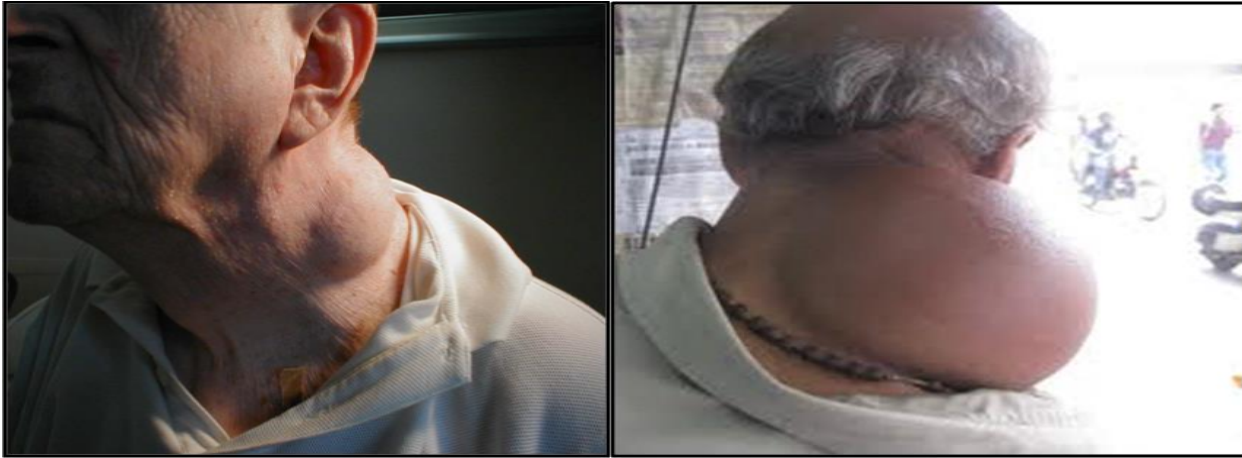
\* *Adenomatous polyp (tubular adenoma) on the left. (right in the picture)*

- 1- crowded disorganized glands
- 2- The glands lined by hyperchromatic cells. (more blue)
- 3- goblet cells are decreased.





## Case28: Lipoma of the Neck



### Gross appearance:

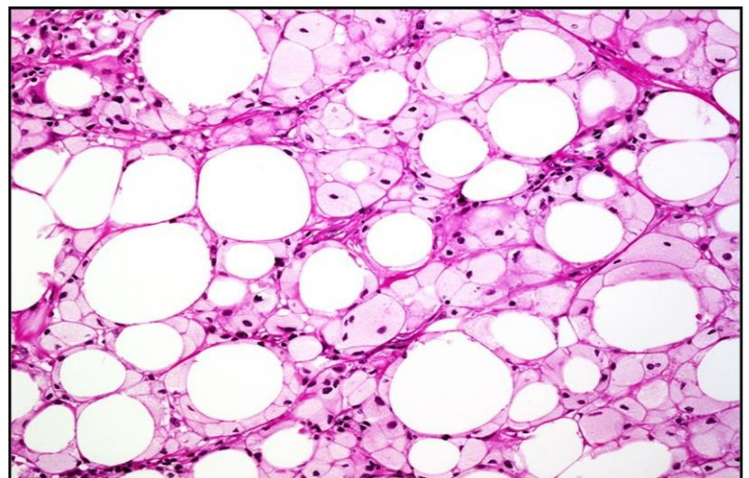
- Benign, Huge mass in the posterior & lateral neck and its clinically soft, not tender and mobile if it's small.
- Cut section show soft lobulation (ص و صدف) with bright yellow surface.

### Histological appearance:

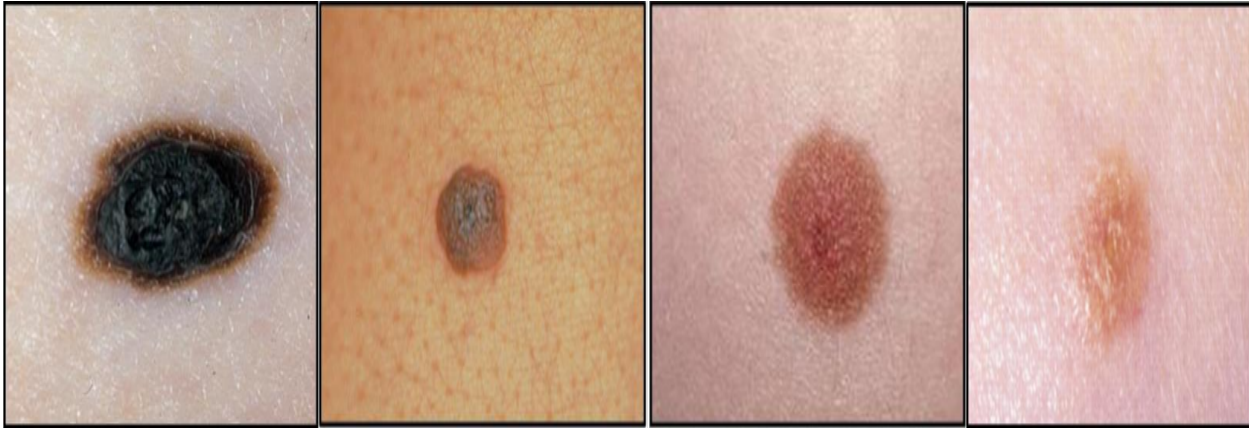
Fat necrosis in lipoma.

- 1- There is a mature (benign) adipocyte separated by fibrous septa (red)
- 2- Nucleus pushed at the periphery
- 3- Cytoplasm is vacuolated

- Malignant tumor of soft tissue is **liposarcoma**.



## Case29: Intradermal Nevus

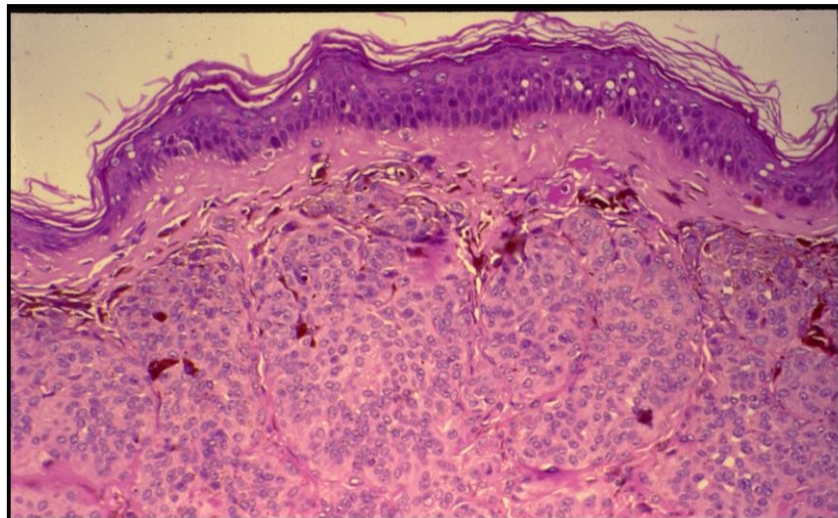
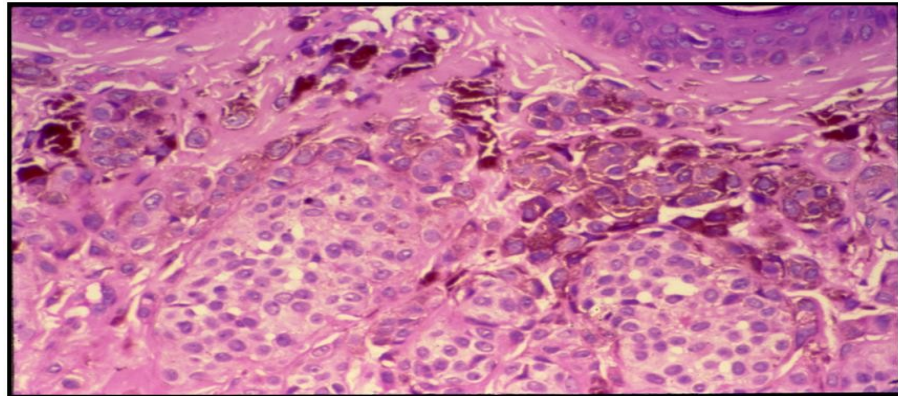


### Gross appearance:

It's a small symmetrical uniform skin lesion (pigmented skin) comes in different colors ( pink, tan, brown, black ..)

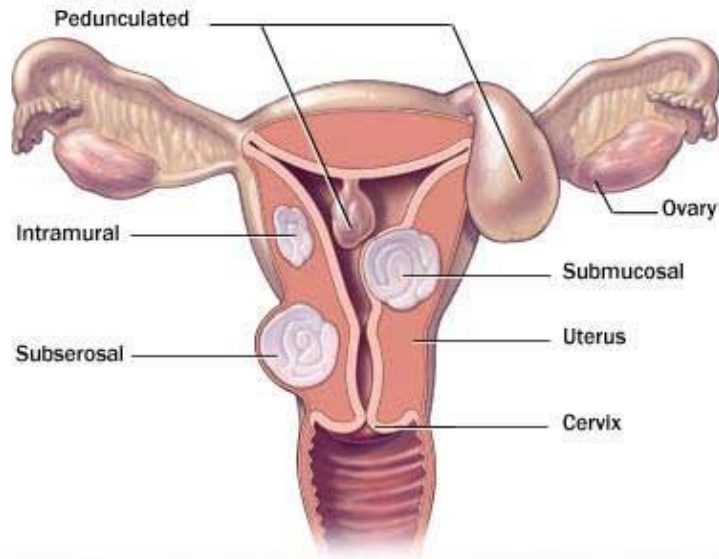
### Histological appearance:

- 1- Nests and cluster of small round or spindle shaped nevus cells
- 2- Present of melanophages
- 3- Contain Melanin pigments
- 4- No junctional activity





## Case 30: Uterine Leiomyomata (benign tumor)



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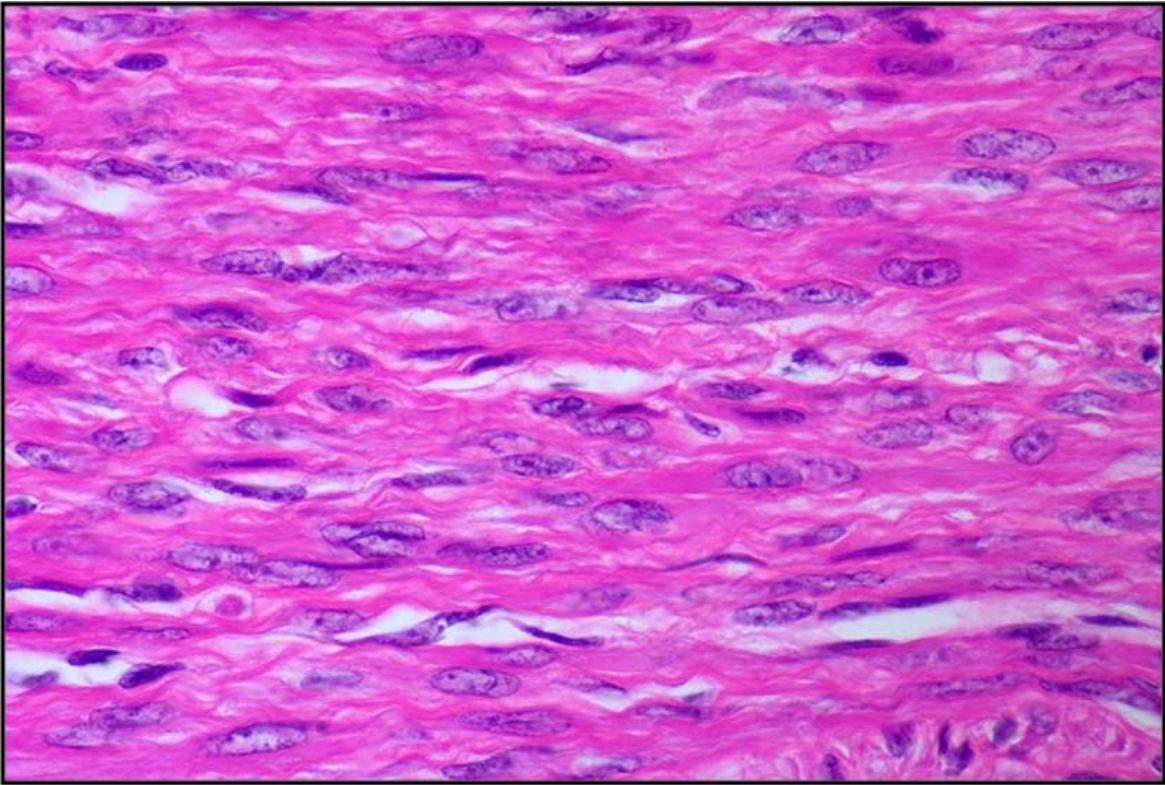
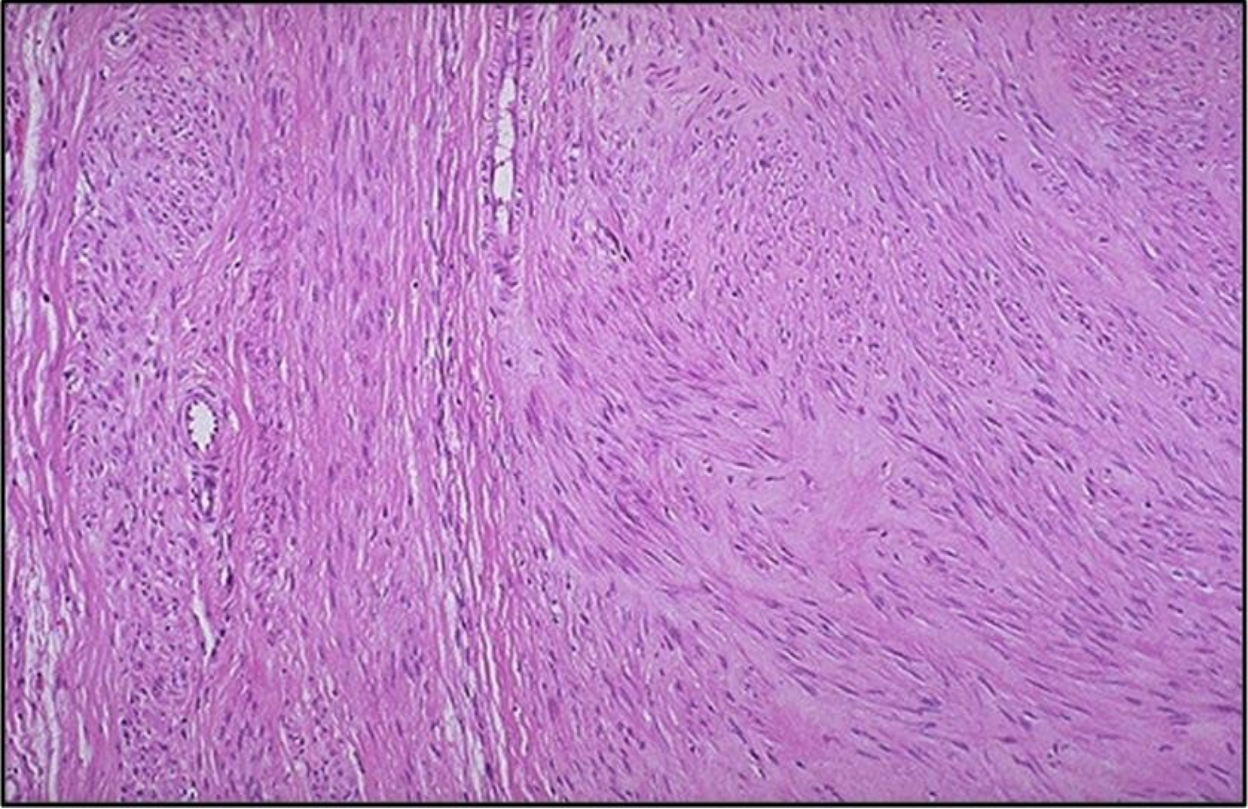
### Gross appearance:



- There are multiple circumscribed masses in the uterus: submucosal, intramural, and subserosal.
- Large uterine mass with whorl pattern. (#2)

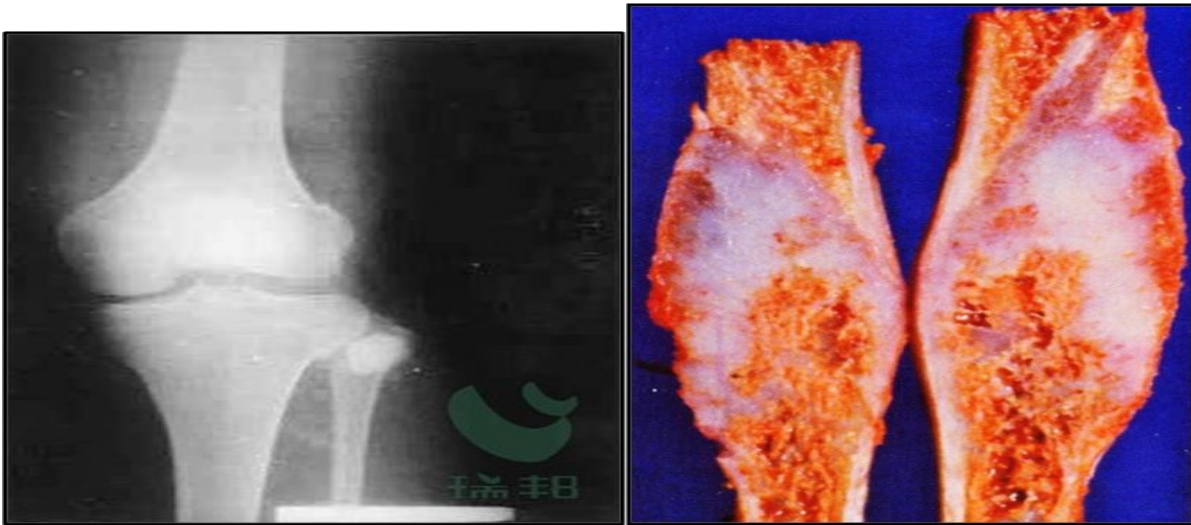
### Histological appearance:

- Proliferation of interlacing bundle of smooth muscle.
- They are spindle-elongated nuclei with eosinophilic cytoplasm (no necrosis no mitosis) (#2)





## Case31: Enchondroma of the fibula

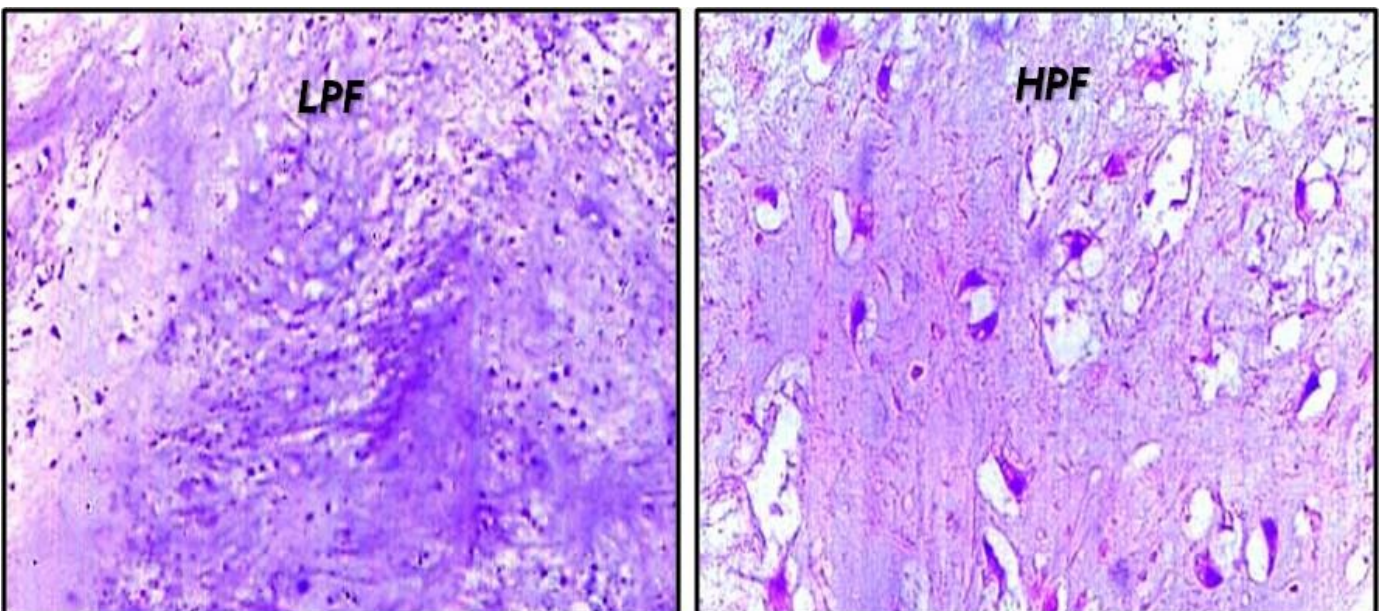


### Gross appearance:

- Well circumscribed chondroid mass in the upper fibula (Left picture)
- 1-intramedullary-bone expansion
- 2-thin bone cortex
- 3-chondromyxoid materials are present (right picture)

### Histological appearance:

- 1- Mature cartilage cells in lacuna (space) with one or two or three nuclei
- 2- Chondromyxoid stroma (pale blue)
- 3- Hypo cellularity (low amount of cells)





## Case 32: Hemangioma of the Skin

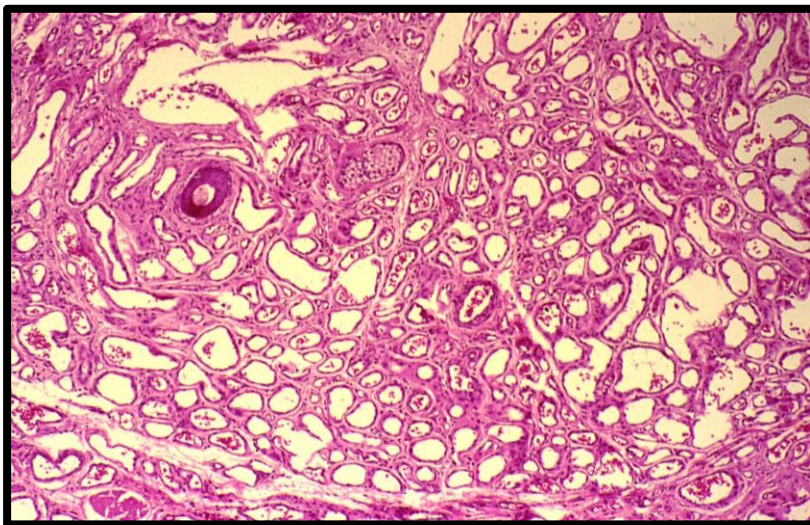
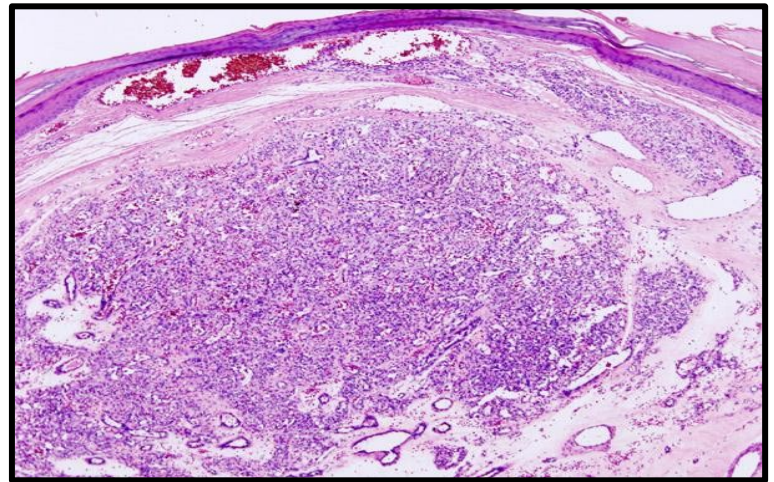


### Gross appearance:

- Multiple hemorrhagic "mass" skin lesion with reddish color, pimples in the skin causes pain.

### Histological appearance:

- 1- Tumor mass composed of variable **vascular spaces**
- 2- Vessels lining by flat benign endothelial cells
- 3- They are separated by connective tissue **stroma**.
- 4- (Picture Below) Same description, the different is it has larger vascular spaces (large haemangioma<sup>4</sup>) "idiopathic thrombocytopenic Barbra" mostly found in pediatric.



<sup>4</sup> مرو یناعو لایوم دلار ی باک



## Case 33: Teratoma (dermoid cyst) of the ovary



### Gross appearance:

- Teratoma in testis is always malignant.
- Teratoma in ovary :

#### A- mature teratoma "benign"

*The embryonic 3 layers: 1- mesoderm 2- ectoderm 3- endoderm*

#### B- mature teratoma + immature "malignant"

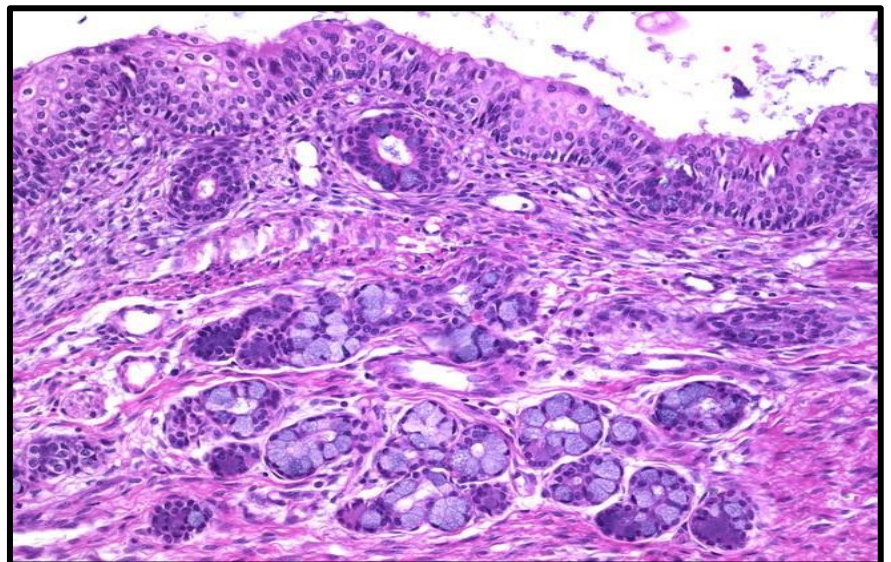
***Mature** is the 3 layers, the immature is primitive cells*

### Description of the picture:

- Cystic ovarian mass containing a ball of hair
- 2-yellowish greasy material

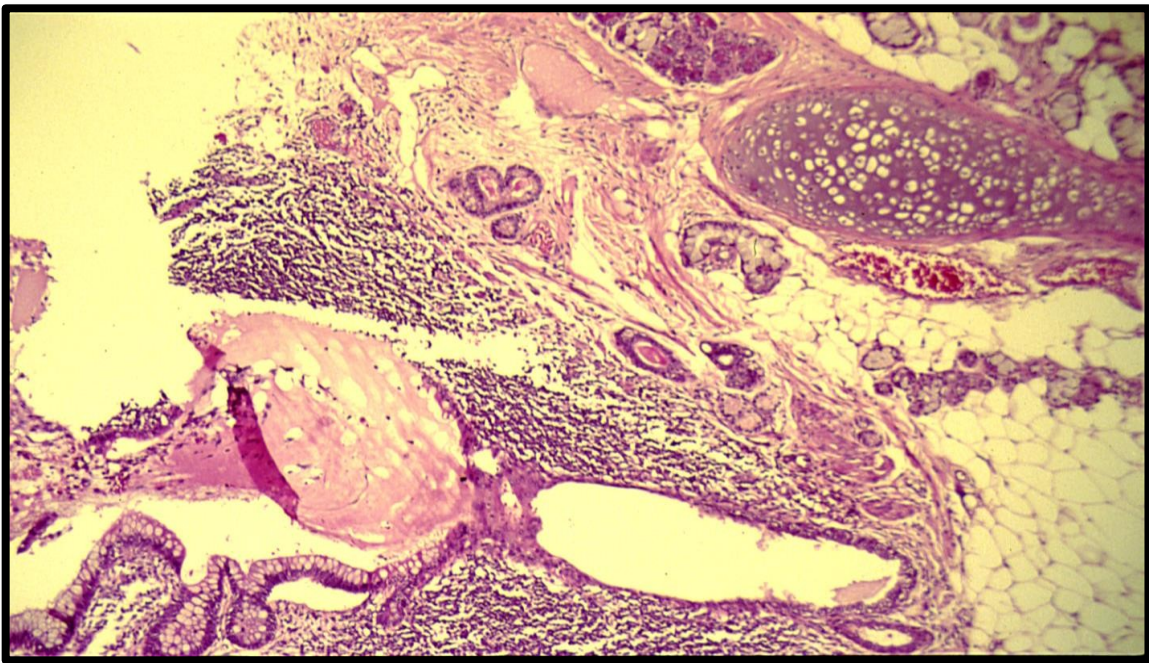
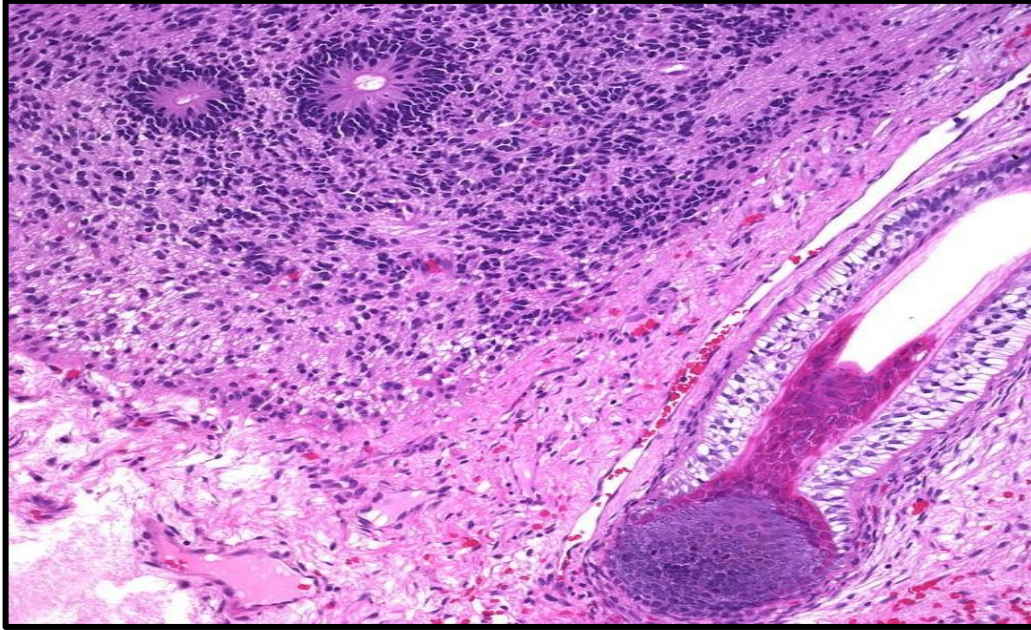
### Histological appearance:

- 1- Hair follicle (mature component)
- 2- Neuroepithelial<sup>5</sup>tubules (immature)



<sup>5</sup> Neuroepithelial cells are the "stem cells" of the nervous system, deriving from actual stem cells in several different stages of neural development.





- 1- This image shows skin and mucinous glands in a mature solid teratoma of the ovary ( #2 picture)
- 2- Blood vessels, mucinous glands, nerve tissue, cartilage, sebaceous glands, squamous epithelium, gut intestinal epithelium, fat and lymphoid tissue (mature)



## Case 34: squamous cell carcinoma of the skin

### Gross appearance:

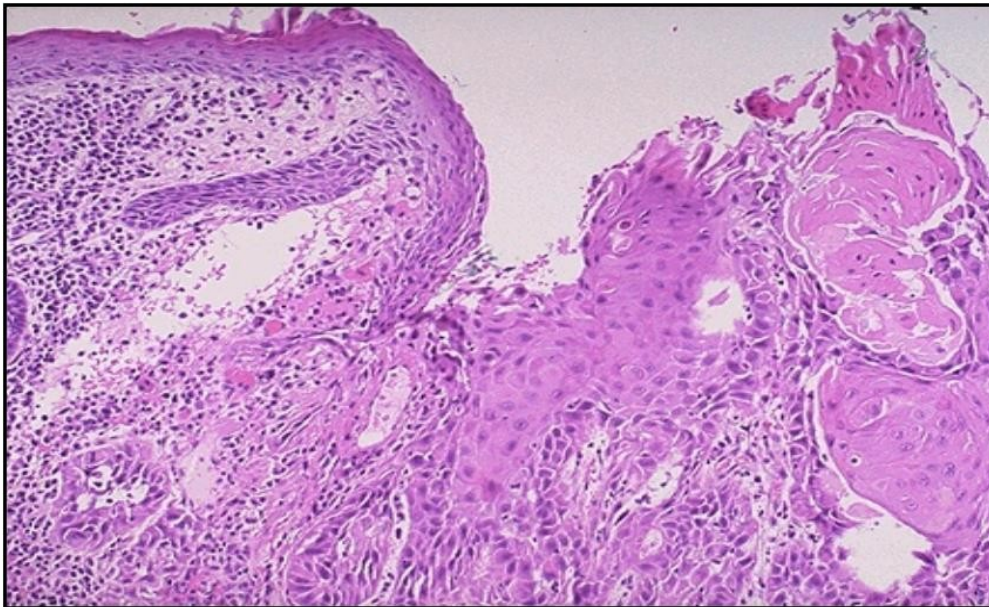


Features: (clinical presentations)

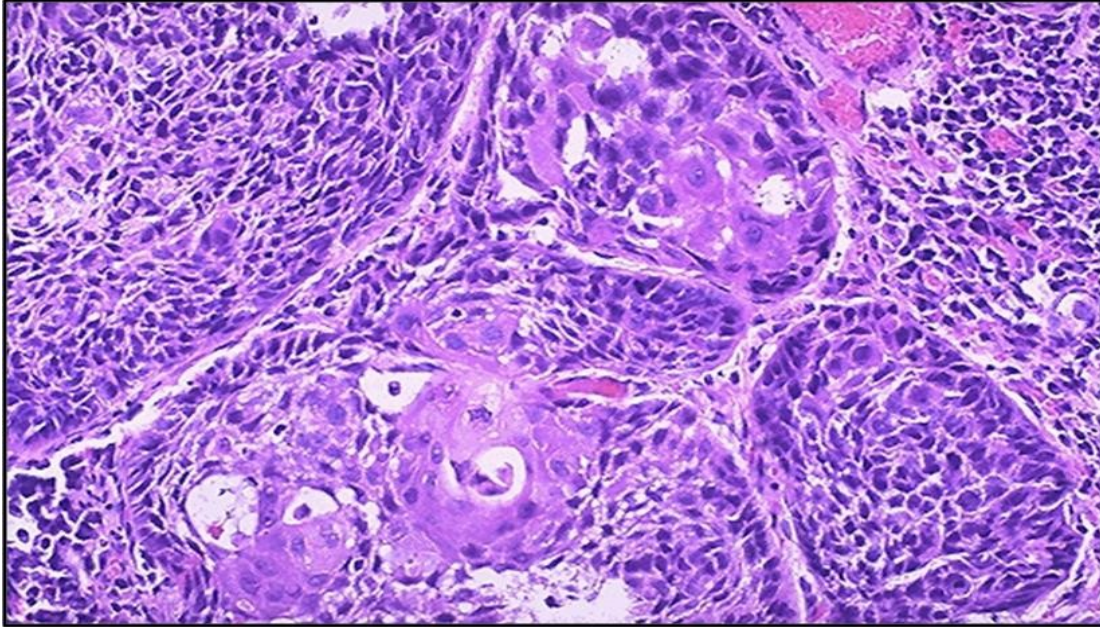
- 1) It is found on sun exposed areas.
- 2) Any sore (lesion to the skin) that doesn't heal.
- 3) Bleeds easily
- 4) Slow growing and may be ulcerated

### Description:

An irregular fungated (there is necrosis in the center and the center is raised, ulcerated, skin lesions.





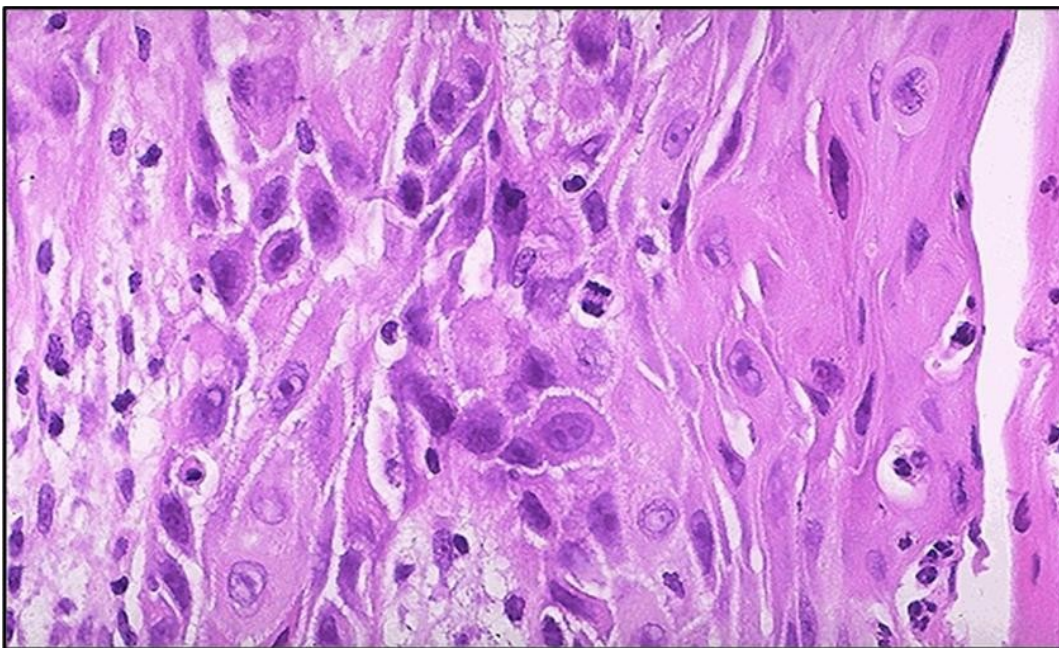


### **Histologically:**

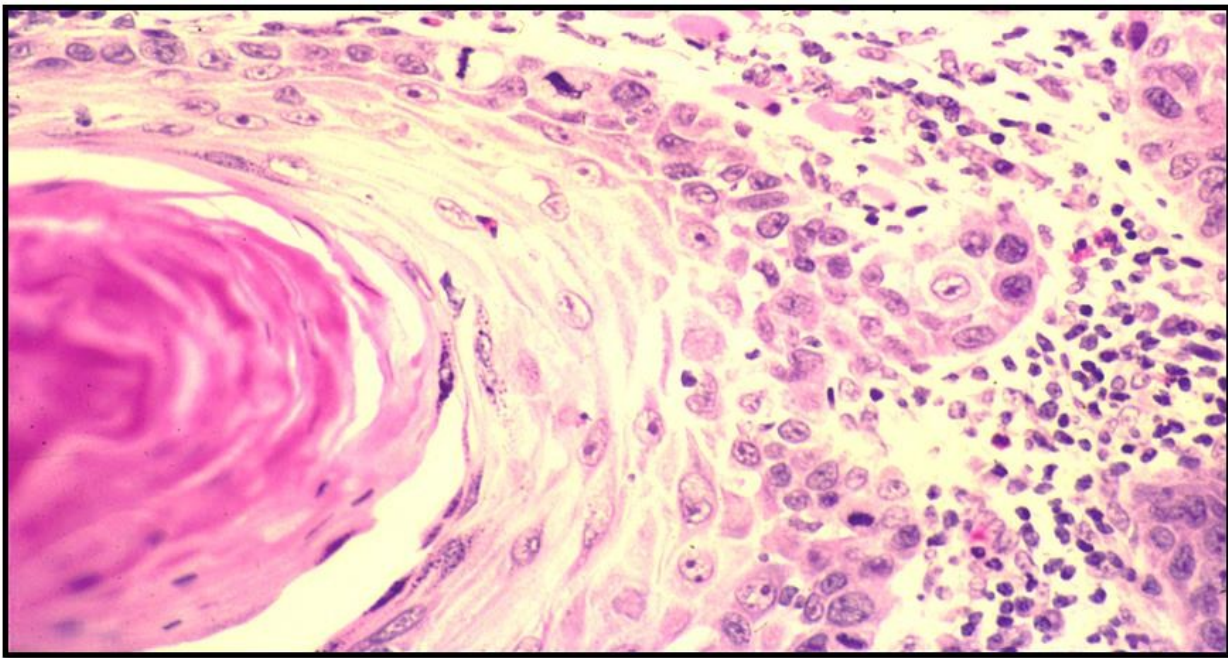
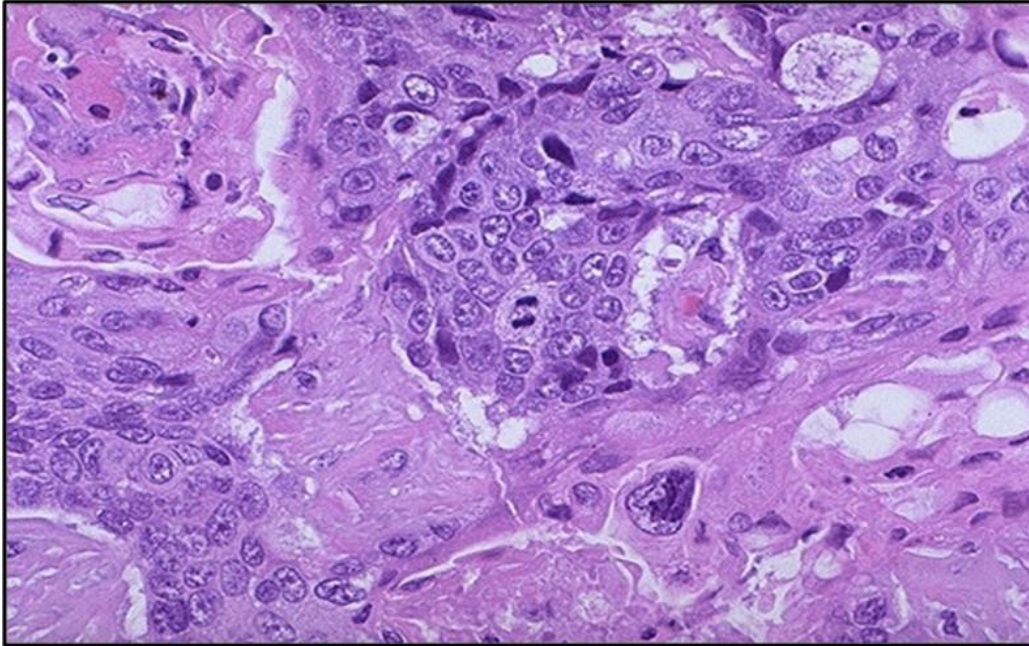
note: the left side of the picture is normal squamous epithelium but the right side is squamous cell carcinoma. Notice the difference in shape, the fist is well organized and looks beautiful while the malignant cells look ugly and disorganized.

A very important quality of squamous cell carcinoma is invading the dermis. If it still didn't invade the dermis it will be called **carcinoma in situ**.

The malignant squamous cells are invading (infiltrating) the dermis.







**The squamous cells characteristics:**

- 1) **Pleomorphism:** large variation in size between the malignant cells.
- 2) **Hyperchromatism:** malignant cells have large nuclei with dense chromatin because they are very active.
- 3) Abnormal mitosis.
- 4) Formation of intercellular bridges between malignant cells.
- 5) Individual cell keratinization: malignant squamous cells produce keratin and their cytoplasm may be pinkish.
- 6) Keratin pearls (very clear in the last picture of this section) pinkish laminated material.
- 7) There are inflammatory cells.

## Case 35: Adenocarcinoma of the large intestine

### Clinical presentations: (signs or symptoms)

- 1) intestinal obstruction (constipation)
- 2) abdominal pain
- 3) bleeding through the rectum

### Gross description:



Irregular large fungating mass arising from the mucosa of the large intestines (colon)

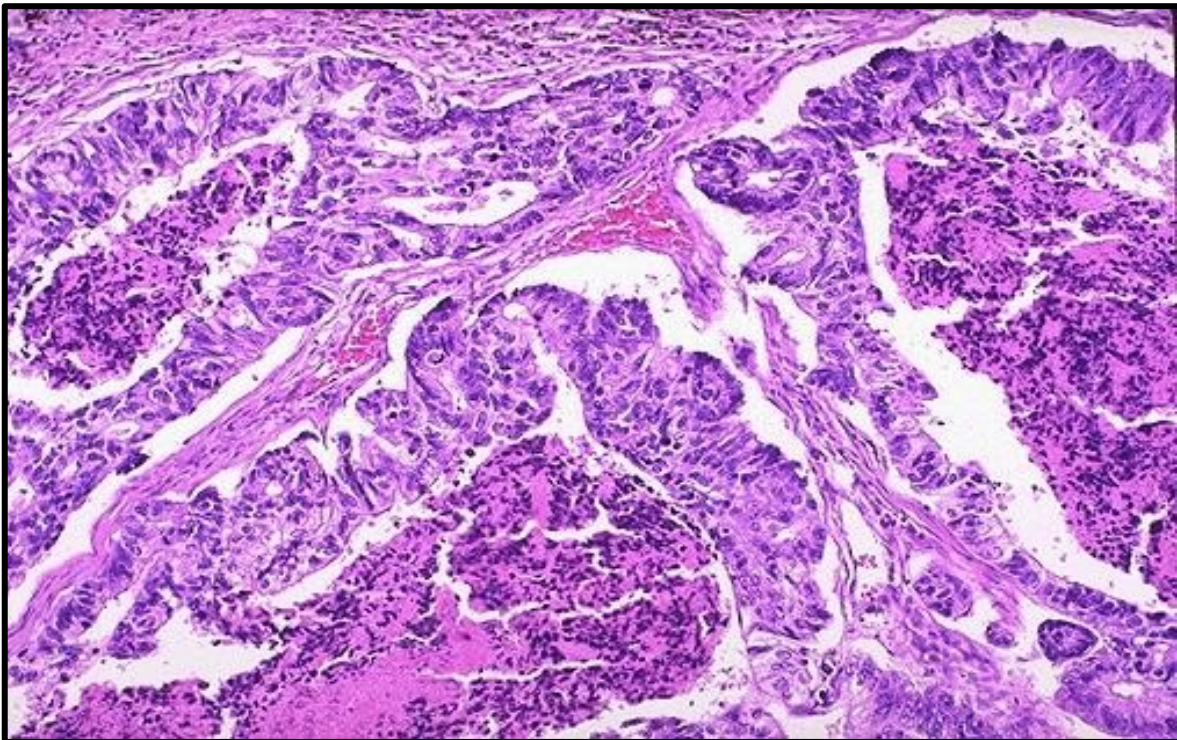


Large palpating masses arising from the mucosal layer of the colon.

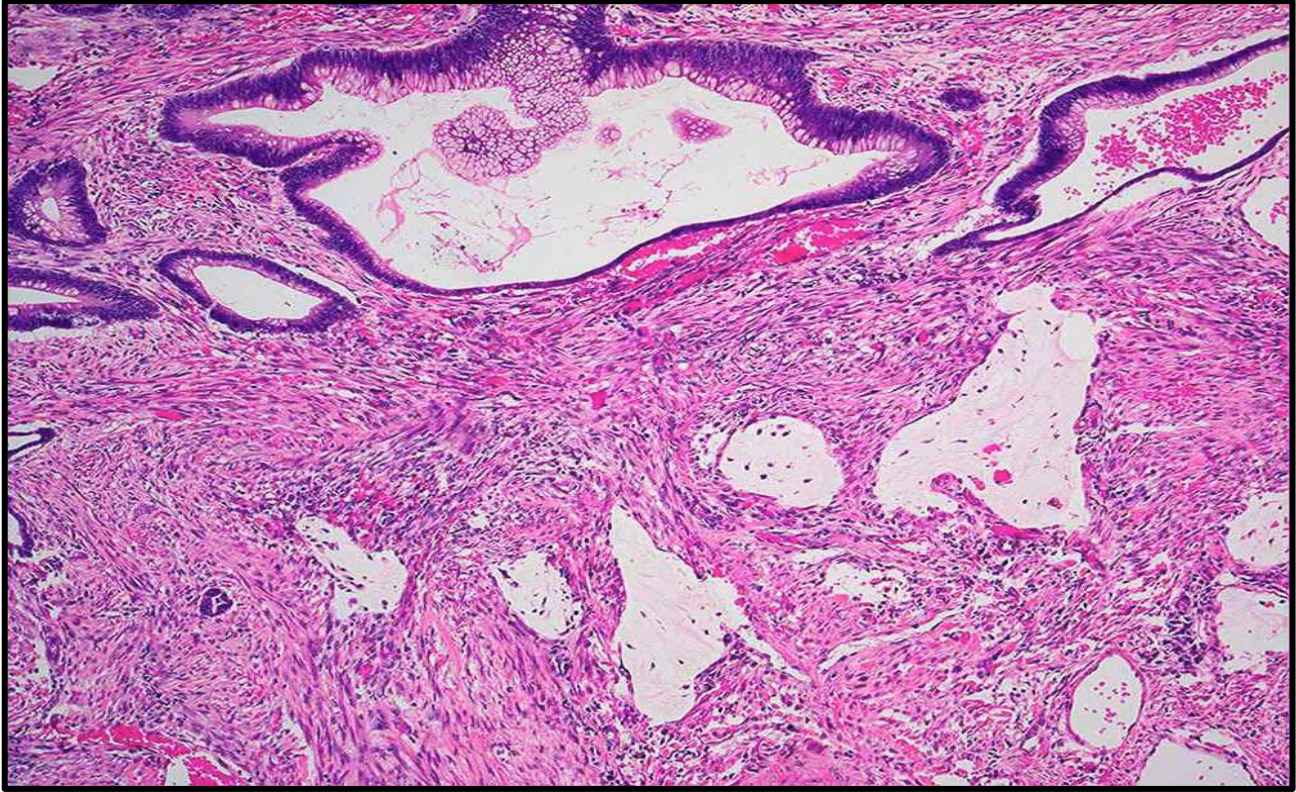


## Histologically:

- Crowded malignant glands invading the muscle coat (stroma), with a fibrovascular stroma.
- The malignant glands are lined by malignant cells epithelial cells with pleomorphism, hyperchromatism, & presence of mitosis.



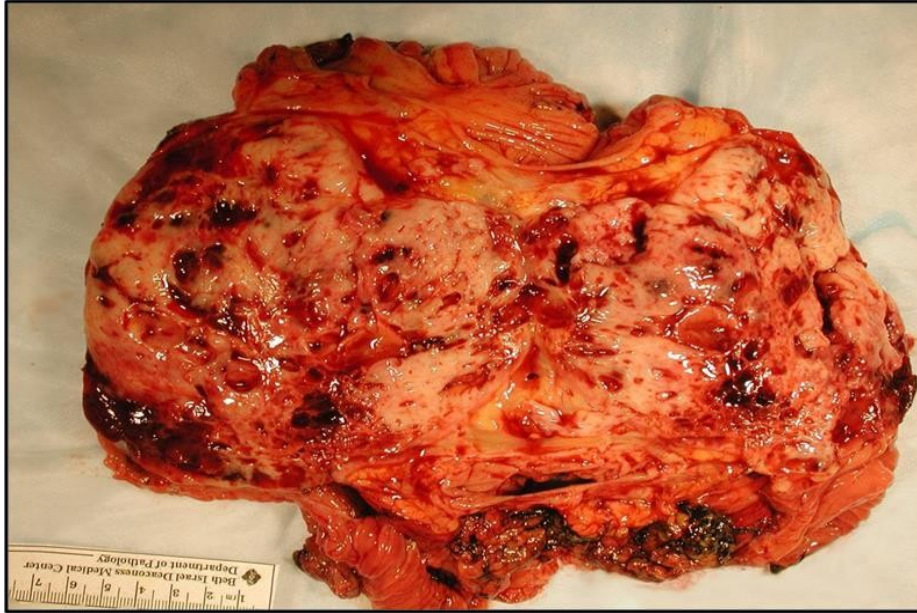






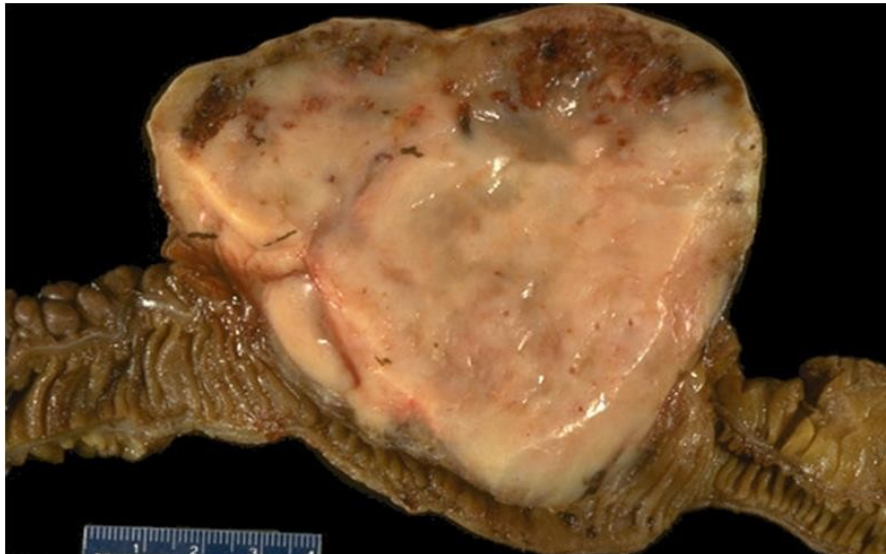
## Case 36: Leiomyosarcoma

- It is found in the soft tissue and in organs with smooth muscles like the **uterus & intestines**.
- It is a **malignant tumor** of smooth muscle layer.



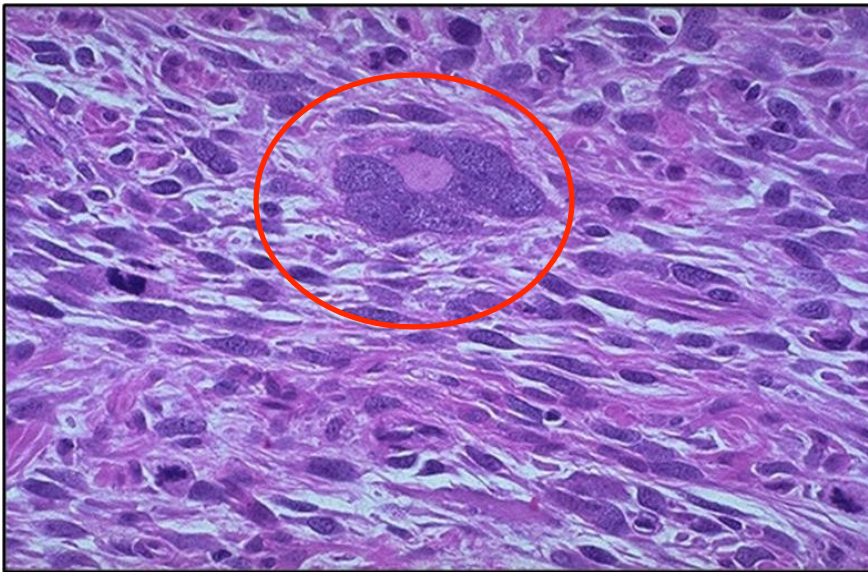
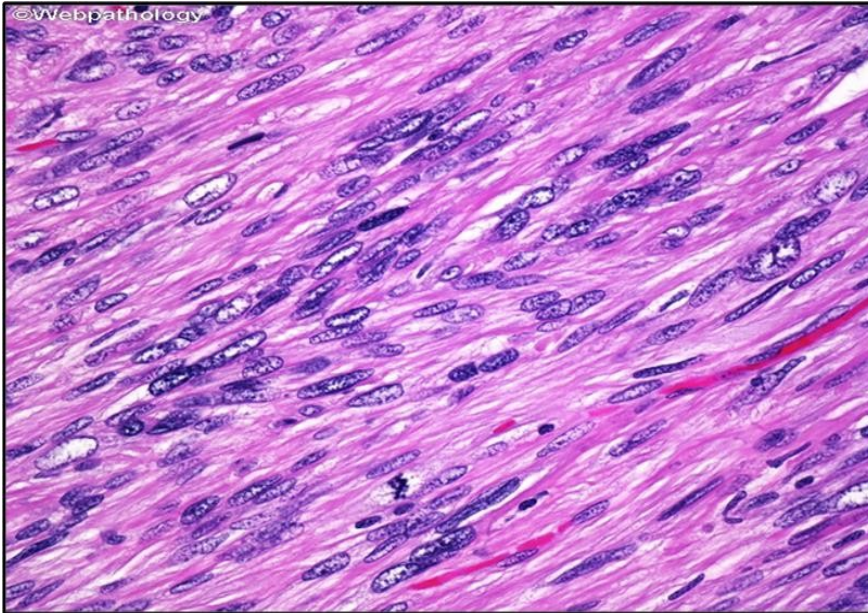
### Grossly:

- Large irregular fleshy mass with **necrosis** and **hemorrhage**



Large irregular fleshy mass with necrosis and hemorrhage arising from the wall of the small intestine

## Histologically:



- 1) Large, crowded (cellular), atypical, spindle cells with pleomorphism, hyperchromatism, & active in mitosis.
- 2) Malignant giant cells are found in the 2nd picture, with spindle cells that are **atypical**, cellular (crowded), pleomorphic & active in mitosis.



**Done by:**

معاذ العيسى  
عبدالرحمن بري  
أنس الزهراني  
حاتم العبيدي  
محمد الخراز  
مها الربيعه

Contact us on: [Pathology434@gmail.com](mailto:Pathology434@gmail.com)

Twitter: @Pathology434

**Good Luck! 😊**