



# CVS PATHOLOGY

Modified NO:10



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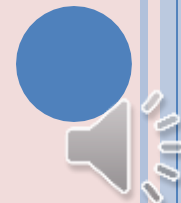
الدكتور: نسرین أبو شاهین.د





# CVS TUMORS

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- There are many tumours can affect the CVS, a group of those tumours are called together **cardiovascular tumours**, because they have one or single cell origin which is the endothelial cells.
- So, vascular tumours is a group of tumours that originate from ECs.
- Those tumours can be categorised into 3 different types according to their morphology, as well as their clinical behaviours.

# Vascular Tumors

## Benign tumors

- Contain vascular channels **formed by ECs**
- Lined by normal-appearing endothelial cells

- most common  
No metastasis  
Benign behavior

e.g. hemangioma

## Borderline tumors

- intermediate between benign and malignant behavior

- Rare  
- No metastasis (that's why they are not malignant)  
- Locally aggressive (that's why they are not benign)

e.g. kaposi sarcoma

## Malignant tumors

- More cellular  
Cytologic atypia  
Proliferative  
- Do not form well-organized vessels

rare metastasis

e.g. angiosarcoma

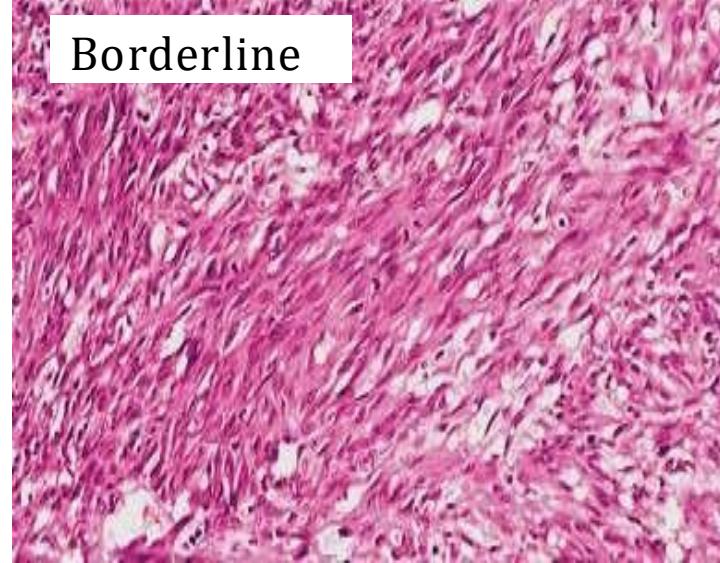




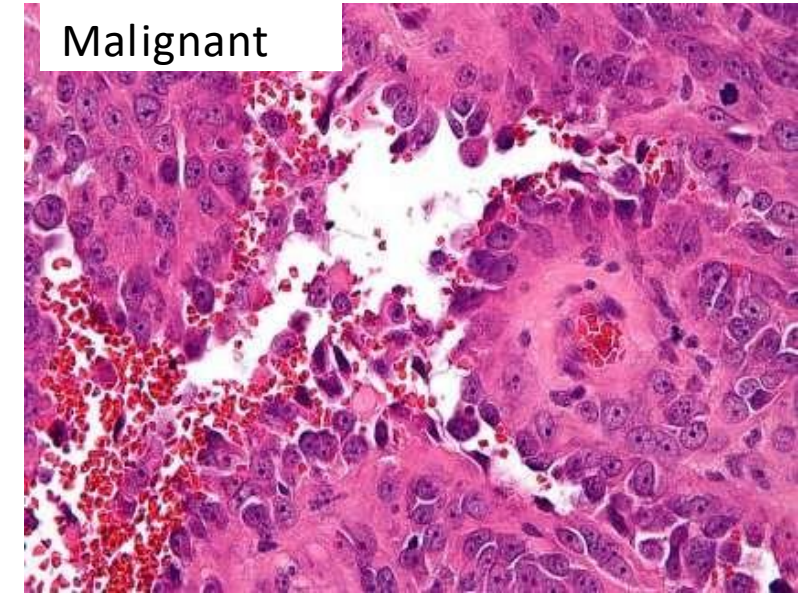
▪ The morphology of vascular tumours:



- Tends to look exactly as the normal ECs, so normal ECs will be in the inner aspect of a vascular space that contains RBCs and blood.
- Flat cells.
- Don't show high degree of atypia.



- Higher degree of atypia.
- More spindles.
- Will not tend to form well organised vascular channels, instead they will have small vascular channels or abnormally shaped vascular patterns .

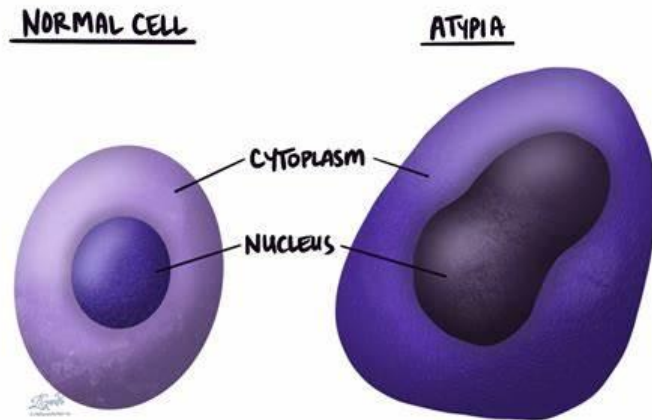


- High degree of cytological atypia and anaplasia.
- They have a lot of mitosis.
- They will not tend to form well organised vascular channels or BVs.

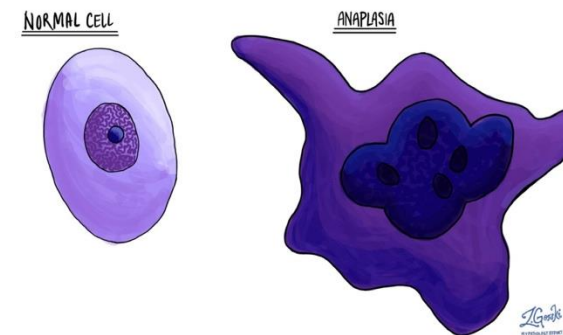


- This is an additional slide just to understand what is **atypia and anaplasia** meaning (you can skip it 😬)

- **Atypia** is a pathological term that describes cells with abnormal appearances under the microscope.
- **Key Features of Atypia:**
  1. Variability in Size and Shape: Cells or their nuclei may appear irregular.
  2. Nuclear Abnormalities: Changes in nuclear size, shape, or staining.
  3. Loss of Normal Organization: Cells may lose their usual arrangement.



- **Anaplasia** is a pathological term describing the loss of differentiation and structural organization in cells, often seen in malignant tumors.
- **Key Features of Anaplasia:**
  1. Pleomorphism: Cells and nuclei vary widely in size and shape.
  2. Hyperchromasia: Darkly stained nuclei due to increased DNA content.
  3. High Nuclear-to-Cytoplasmic Ratio: Disproportionately large nuclei compared to the cytoplasm.
  4. Abnormal Mitoses: Presence of irregular or atypical mitotic figures.
  5. Loss of Polarity: Cells lose their organized alignment and orientation.



Please read what is written  
in the box first 🖐️ 🖐️

## NOMENCLATURE

### ○ Hem-angi-oma

○ Benign vascular tumours that show vascular channels contain blood 🩸

### ○ Lymph-angi-oma

○ Benign vascular tumours that look like lymphatic vessels

### ○ Angiosarcoma

○ Malignant vasculat tumor

- This nomenclature help you to know a brief description about the tumours 🔥
- So let's break down those terms 🧐 🧩
- **Hem** : represents blood, so it is a tumour that contains blood 🩸
- **Angi** : means BLOOD VESSELS
- **Oma** : means benign
- **Lymph**: lymphatic vessels like morphology
- **Sarcoma** : means malignant tumours



# 1. HEMANGIOMA

- common
- composed of blood-filled vessels.
- m/c age: infancy & childhood
- Most are present from birth
- many regress spontaneously (↓ size) (decrease in size and become fainter in colour as child growing)
- m/c location: head and neck (subcutaneous location)
- Some in internal organs (1/3 → liver)
- Malignant transformation (transformation of a benign tumor into a malignant one): very rare



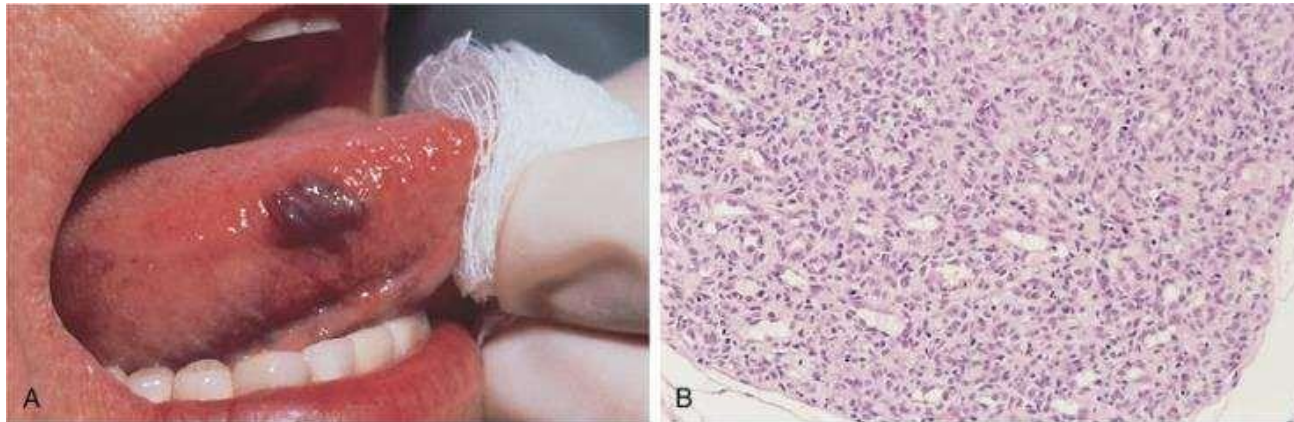


## HISTOLOGIC AND CLINICAL VARIANTS:

### 1- Capillary hemangiomas :

- most common type
- The most common affected sites:
- skin and mucous membranes of oral cavity & lips

- The tongue is affected.
- Dark colour (it looks like a bruise (الكدمة)).



- They are called capillary hemangiomas because the vascular spaces that are formed in the tumours look like capillaries.



## HISTOLOGIC AND CLINICAL VARIANTS:

### 2- strawberry hemangiomas of newborn (juvenile hemangioma):

- m/c head & neck ( a scalp is a common legion for this tumor)
- **These tumors appear since birth and usually regress with time.**



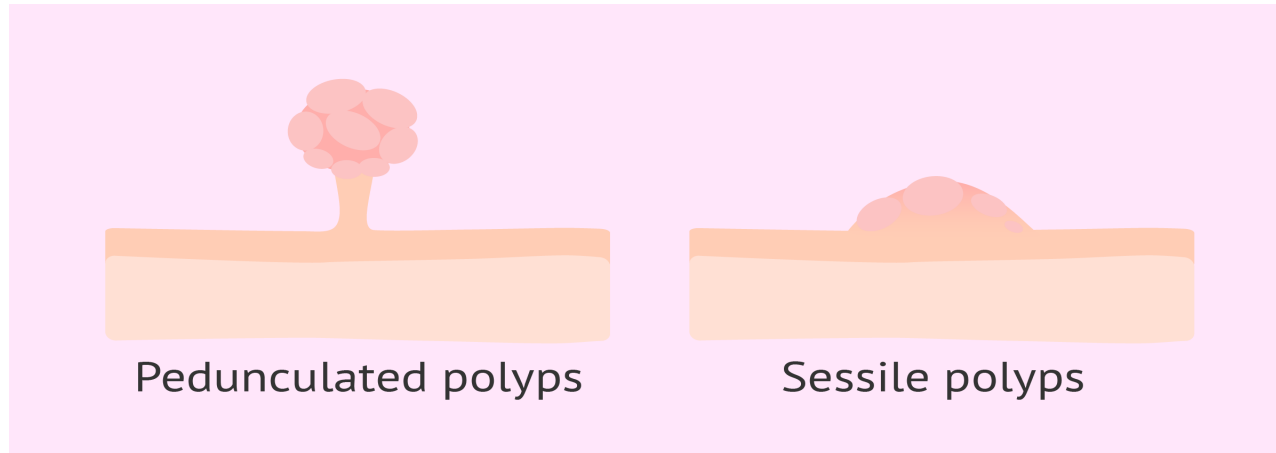
## HISTOLOGIC AND CLINICAL VARIANTS:

### 3- *Pyogenic granulomas:*

- rapidly growing pedunculated lesions ([see the next slide](#)) on gingival mucosa
  - 1/3 history of trauma
- The word pyogenic is a misnomer, so it is not true that it is pyogenic and is not true that it is containing granuloma. ([see the next slide to understand](#))



- Pedunculated lesions refer to abnormal growths or tumors that are attached to the surrounding tissue by a narrow stalk or stem, called a peduncle.



- The word pyogenic is a misnomer, so it is not true that it is pyogenic and is not true that it is containing granuloma. (کیف کیف کیف؟)

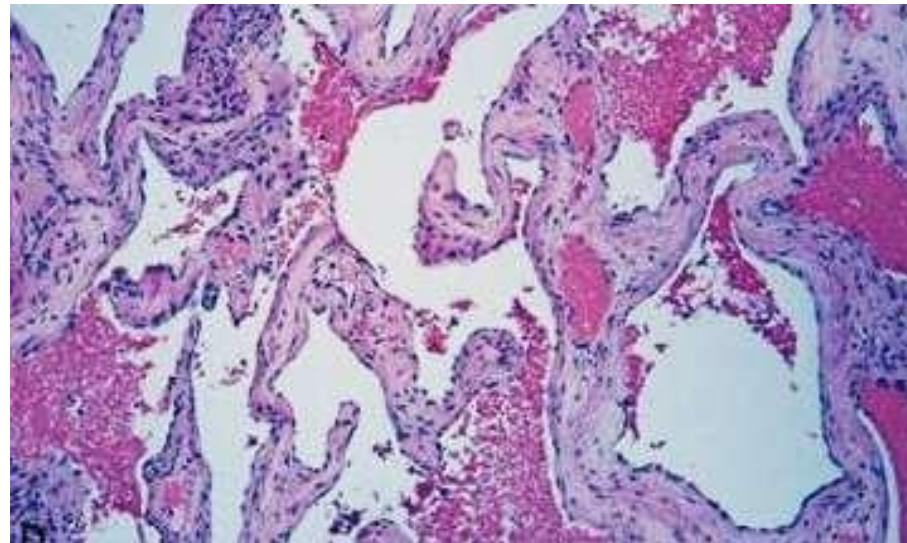
- The name "**pyogenic granuloma**" is misleading because:
  - "**Pyogenic**" means "pus-producing," but **pyogenic granulomas** do not produce pus.
  - "**Granuloma**" refers to a type of inflammation with special immune cells, but **pyogenic granulomas** are just extra blood vessels, not true granulomas.
  - So, the name is wrong because it suggests these growth involve pus or specific inflammation, which they do not. 😊



## HISTOLOGIC AND CLINICAL VARIANTS:

4- **Cavernous hemangiomas** (The word cavernous comes from (cave), and a cave as you know is a large space):

- large, dilated vascular channels
- deep organs (liver most common)
- do not spontaneously regress

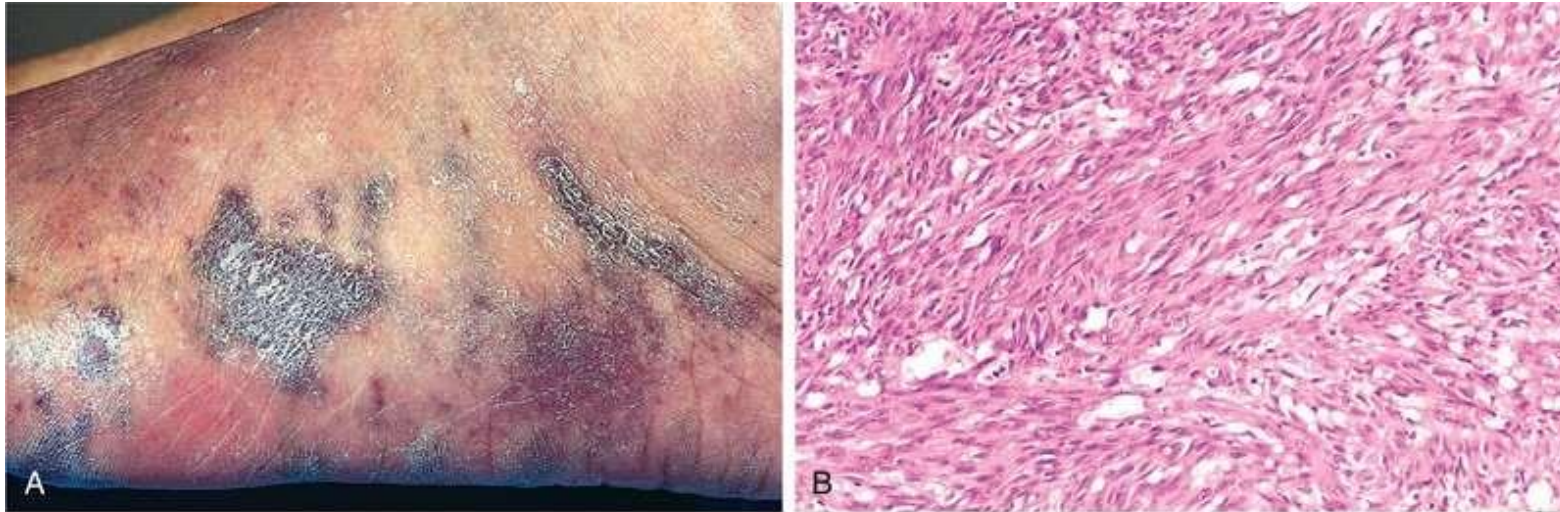


## 2. INTERMEDIATE-GRADE (BORDERLINE) TUMORS

- **Kaposi Sarcoma (KS)**
- a vascular neoplasm caused by human herpesvirus- 8 = **HHV-8**
- *Several types: classic; endemic; Transplantation-associated; and AIDS- associated.*
- **AIDS-associated (epidemic) KS is an AIDS- defining illness (used as a criterion for diagnosis of AIDS) because it is very common in those patients**
- *The most common HIV-related malignancy*
- *HIV infection is related to the weakness of the immune system, as a result HHV 8 can be activated inside the infected Ecs and then it will transform those ECs into KS.*



kaposi sarcoma: Multiple red-purple skin plaques or nodules, usually on the distal lower extremities; progressively increase in size and number and spread proximally



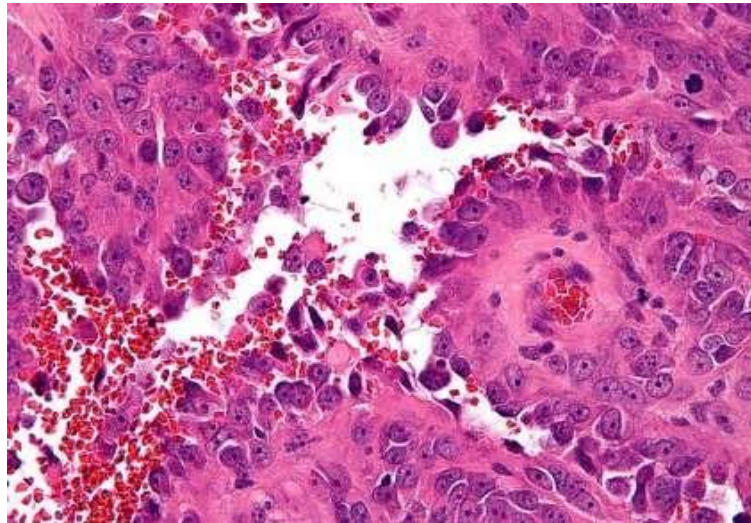
Kumar et al: Robbins Basic Pathology, 9e.  
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- Under microscope these tumours look like spindle shaped cells that are quite crowded and don't form well organised vascular channels.

### 3. MALIGNANT TUMORS

#### ○ *Angiosarcoma* :

- lesions can occur at any site, but most often involve the **skin**, soft tissue, breast, and liver.
- Pathogenesis= ? Carcinogens; ?unknown (complicated process)
- A latent period between exposure and tumor development



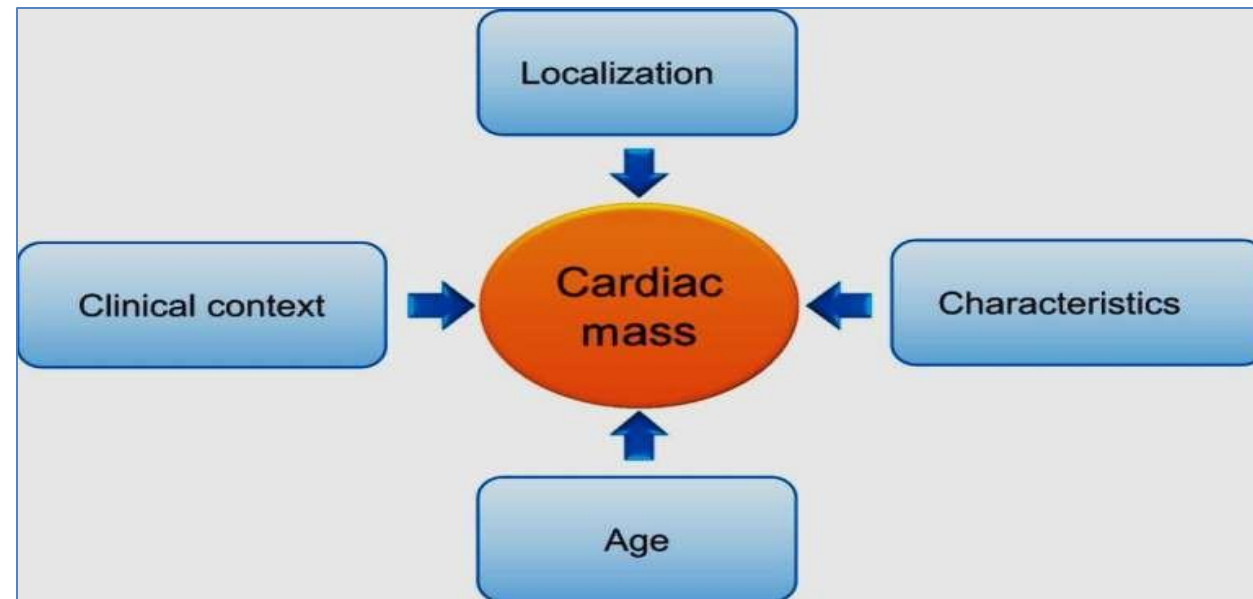


## RISK FACTORS OF ANGIOSARCOMA

- **Chemical** carcinogens → liver angiosarcoma
- **Irradiation**
- **Lymphedema** → can also be a risk factor
  - e.g. ipsilateral upper extremity several years after radical mastectomy with lymph node resection for breast cancer (rare)
- **foreign bodies** → long-term (years)



- Moving to the second part of the lecture which is **cardiac tumours**.
- When we evaluate any cardiac mass, many factors will play a role in the prognosis and outcomes of this lesion, the factors:
  1. The exact location of this tumour ( in cardiac chambers for example or in cardiac valve )
  2. The clinical context by which the cardiac mass is now presenting.
  3. The age of the patient is very important.
  4. The characteristics or the behaviours of the tumours is also important.
- **So, it is not a single thing to look at**



# CARDIAC TUMORS

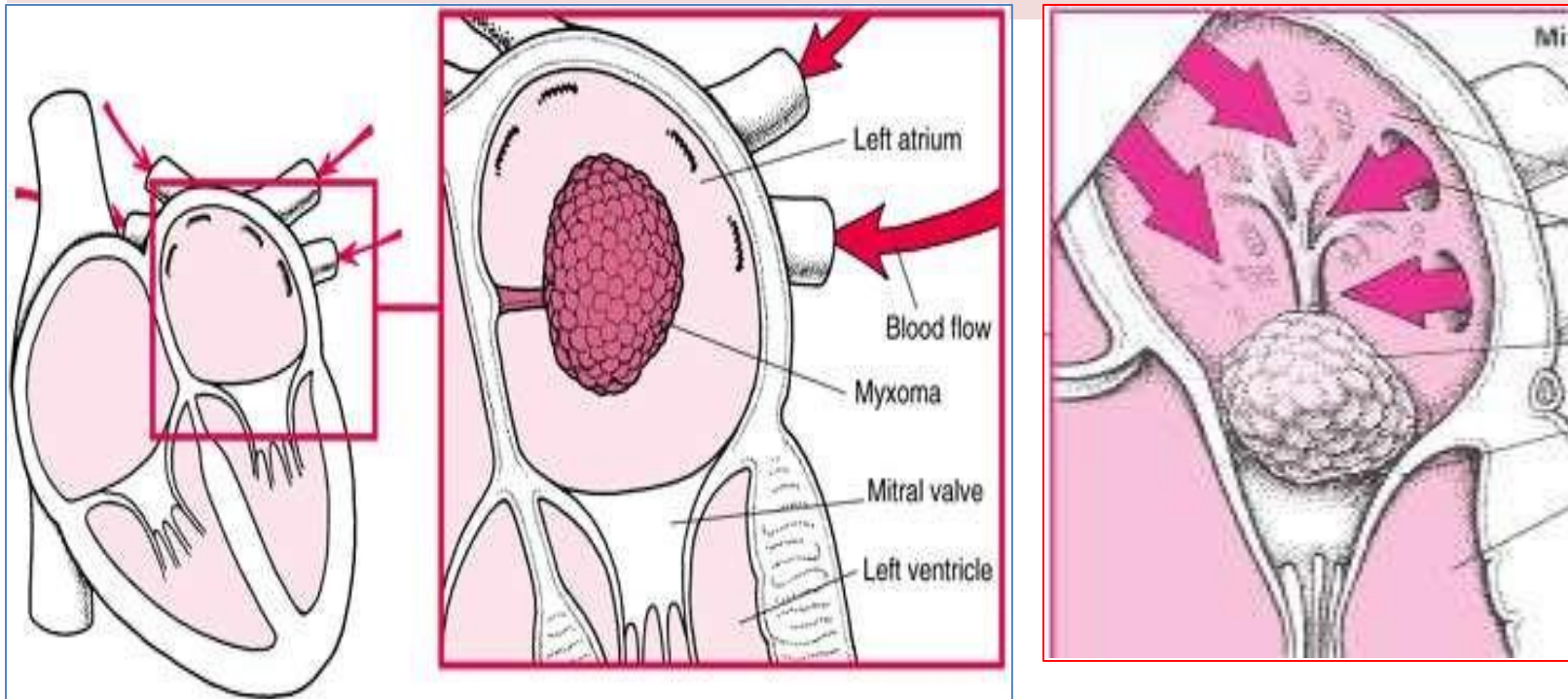
- Very rare
- Metastatic Neoplasms are the most common malignancy of heart (5% of patients dying of cancer).
- most common source → lung cancer  
(Of the metastatic neoplasm)
- Angiosarcomas → most common primary malignant tumor of heart.
- Benign tumors are also very rare but important for their critical location



# CLINICAL FEATURES AND SIGNIFICANCE

- 1 "ball-valve" obstruction
- 2 Embolization (from the tumour)
- 3 fever and malaise → tumor elaboration of **interleukin-6**

- **Diagnosis:** Echocardiography
- **Treatment:** surgical resection in benign tumors.



- Ball valve obstruction > the tumour with its stock can move with the heart during systole or diastole with the direction of blood flow so, these tumours can cause transient occlusion of the heart valve either during systole or diastole and this can be significant





## E-learning Questions:

1. ONE is the name of a malignant vascular tumor:

- A. hemangioma
- B. angiosarcoma
- C. lymphangioma

2. ONE is correct regarding cardiac neoplasms:

- A. extremely common neoplasms
- B. All are malignant
- C. All are benign
- D. significant in part because of their critical location

إِلَّا تَصُروْهُ فَقَدْ نَصَرَهُ اللهُ إِذْ أَخْرَجَهُ الَّذِينَ  
كَفَرُوا ثَانِيَ اثْنَيْنِ إِذْ هُمَا فِي الْغَارِ إِذْ يَقُولُ  
لِصَاحِبِهِ لَا تَحْزَنْ إِنَّ اللَّهَ مَعَنَا فَأَنْزَلَ اللهُ  
سَكِينَتَهُ عَلَيْهِ وَأَيَّدَهُ بِمُجُودٍ لَّمْ تَرَوْهَا وَجَعَلَ  
كَلِمَةَ الَّذِينَ كَفَرُوا السُّفْلَىٰ وَكَلِمَةُ اللهِ  
هِيَ الْعُلْيَا وَاللهُ عَزِيزٌ حَكِيمٌ ﴿١١٠﴾

VERSIONS	SLIDE #	BEFORE CORRECTION	AFTER CORRECTION
V1 → V2			
V2 → V3			



امسح الرمز و شاركنا بأفكارك لتحسين أدائنا!!