

Clinically

Hyperemic tissues are **redder** than normal because of engorgement with **oxygenated** blood



Congested tissues have an abnormal **blue-red color (cyanosis)** that stems from the accumulation of **deoxygenated** hemoglobin in the affected area.



8

I. LUNG CONGESTION.

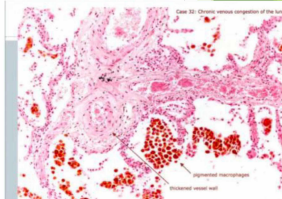
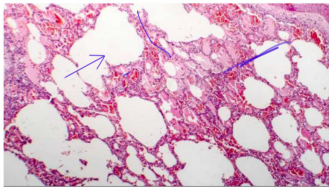
Cut surfaces of hyperemic or congested tissues feel wet and typically ooze blood



Microscopic examination:

acute pulmonary congestion is marked by blood-engorged alveolar capillaries and variable degrees of alveolar septal edema and intraalveolar hemorrhage.

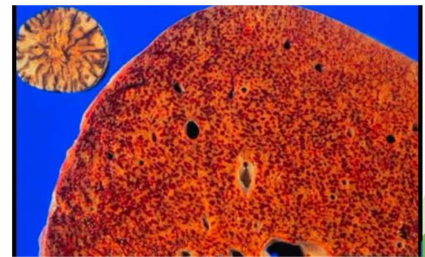
chronic pulmonary congestion, the septa become thickened and fibrotic, and the alveolar spaces contain numerous macrophages laden with hemosiderin ("heart failure cells") derived from phagocytosed red cells.



10

II. HEPATIC CONGESTION.

central areas are red and slightly depressed compared with the surrounding tan viable parenchyma, creating "nutmeg liver"



Microscopic findings include:

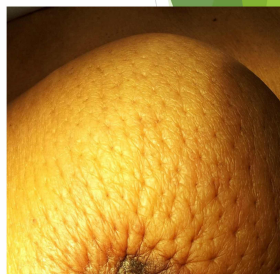
- centrilobular hepatocyte necrosis
- Hemorrhage
- hemosiderin-laden macrophages

11

Anasarca is a medical condition that leads to general swelling of the whole body



Infiltration and obstruction of superficial lymphatics by breast cancer may cause edema of the overlying skin; the characteristic finely pitted appearance of the skin of the affected breast is called **peau d'orange** (orange peel).



23

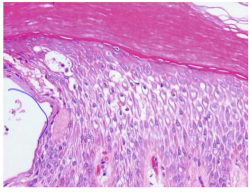
the parasitic infection filariasis can cause **massive edema** of the lower extremity and external genitalia (so-called "elephantiasis").



24

▶ **microscopic examination:**

- ▶ 1. skin : clearing and separation of the extracellular matrix
- ▶ Subcutaneous edema can be diffuse but usually accumulates preferentially in the legs with standing and the sacrum with recumbency, a relationship termed **dependent edema**.
- ▶ Finger pressure over edematous subcutaneous tissue displaces the interstitial fluid, leaving a finger-shaped depression; this appearance is **called pitting edema**

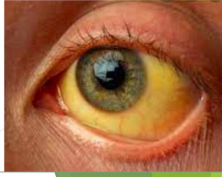
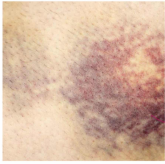


- ▶ Edema resulting from renal dysfunction or nephrotic syndrome often manifests first in loose connective tissues (e.g., the eyelids, causing periorbital edema).



❖ **Hemorrhage may be manifested by different appearances and clinical consequences.**

- ▶ Hemorrhage may be external or accumulate within a tissue as a hematoma,
- ▶ May range in significance from trivial (e.g., a bruise) to fatal (e.g., a massive retroperitoneal hematoma resulting from rupture of a dissecting aortic aneurysm).
- ▶ Extensive hemorrhages can occasionally result in jaundice from the massive breakdown of red cells and hemoglobin.



▶ **2. Purpura**

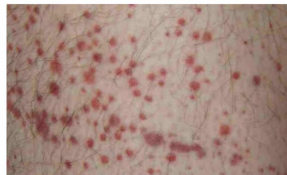
- ▶ are slightly larger (3 to 5 mm) hemorrhages.
- ▶ Purpura can result from the same disorders that cause petechiae, as well as:
 - ▶ trauma,
 - ▶ vascular inflammation (vasculitis).
 - ▶ increased vascular fragility.



Subcutaneous bleeding may present as

▶ **1. Petechiae:**

- ▶ are minute (1 to 2 mm in diameter) hemorrhages into skin, mucous membranes, or serosal surfaces
- ▶ Causes
 - ▶ low platelet counts (thrombocytopenia).
 - ▶ defective platelet function.
 - ▶ loss of vascular wall support, as in vitamin C deficiency.

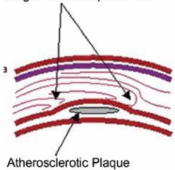


▶ **3. Ecchymoses:**

- ▶ are larger (1 to 2 cm) subcutaneous hematomas (also called bruises).
- ▶ Extravasated red cells are phagocytosed and degraded by macrophages; the characteristic color changes of a bruise result from the enzymatic conversion of hemoglobin (red-blue color) to bilirubin (blue-green color) and eventually hemosiderin (golden-brown)



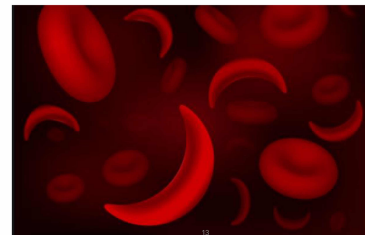
Regions of Disrupted Flow



Aorta with large abdominal aneurysm

▶ **4. sickle cell anemia:**

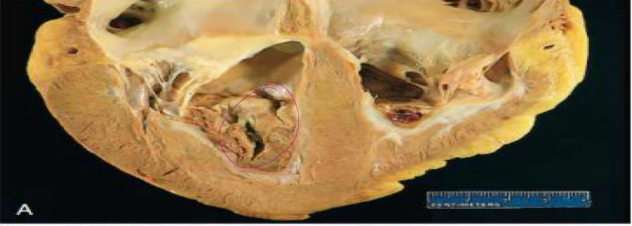
- ▶ The deformed red cells in cause vascular occlusions.



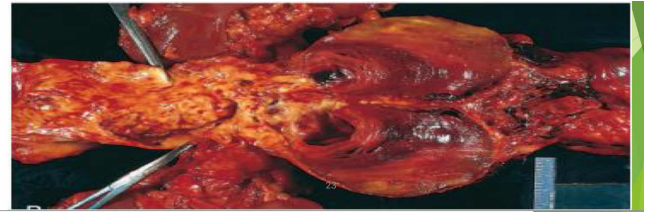
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▶ **Mural thrombi:**
 ▶ **Thrombi occurring in heart chambers or in the aortic lumen**

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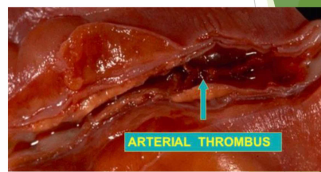
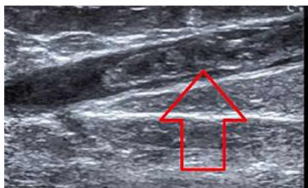


A



*Arterial thrombi are frequently occlusive. They are typically rich in platelets

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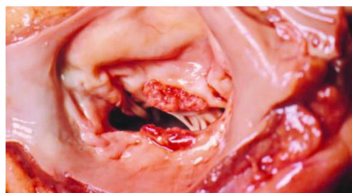
Venous thrombi (phlebothrombosis):

- ▶ They frequently propagate some distance toward the heart, forming a long cast within the vessel lumen that is prone to give rise to emboli.
- ▶ They tend to contain more red cells.

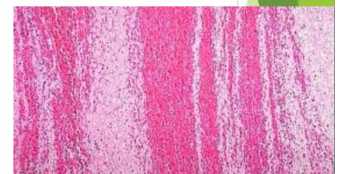
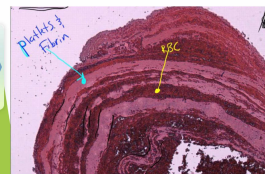


▶ **Vegetations: Thrombi on heart valves, divided into:**

- ▶ **Infective endocarditis:** Infective thrombotic masses
- ▶ **Nonbacterial thrombotic endocarditis:** Sterile vegetations.
- ▶ **LibmanSacks endocarditis:** Sterile, occur in the systemic lupus erythematosus.



▶ Thrombi can have grossly (and microscopically) apparent laminations called lines of Zahn; these represent pale platelet and fibrin layers alternating with darker red cell-rich layers.



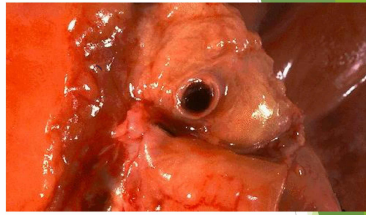
20



Clinical Features

- ▶ **1. Venous Thrombosis (Phlebothrombosis)**
- ▶ Pain.
- ▶ Local congestion and swelling from impaired venous outflow.
- ▶ Varicose ulcers.
- ▶ Rarely embolize.





thrombosis of a coronary artery

Massive thrombosis (arrows) from distal portion of left main coronary artery

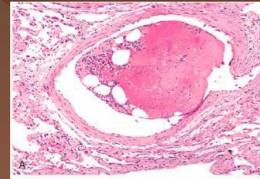


Excessive hemorrhage (Bruising, petechiae).

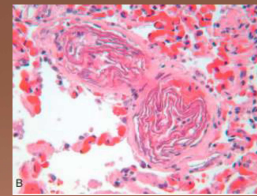


tamponade

cardiac tamponade: fluid or blood builds up between the heart and the pericardium.



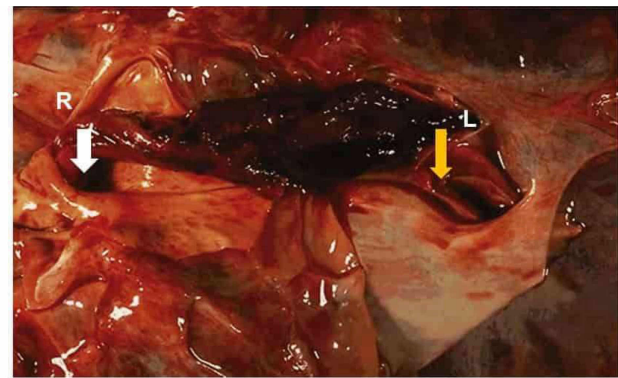
Bone marrow embolus



Amniotic fluid emboli



Hotness
Redness
Tenderness
swelling



Pulmonary embolism, gross;

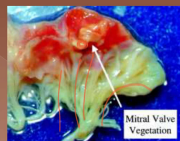
A Saddle embolus that bridges the pulmonary artery trunk as it divides into right and left main pulmonary arteries.

2. Systemic thromboembolism

- Origin:
 1. Intracardiac mural thrombi (80%).
 2. Aortic aneurysms.
 3. Thrombi overlying ulcerated atherosclerotic plaques.
 4. Fragmented valvular vegetations.
 5. The venous system (paradoxical emboli).

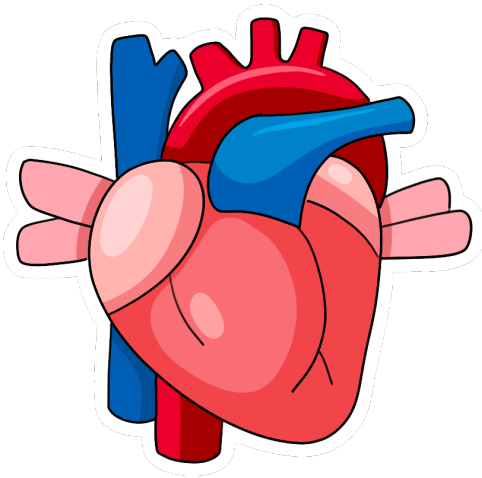


Aortic aneurysms

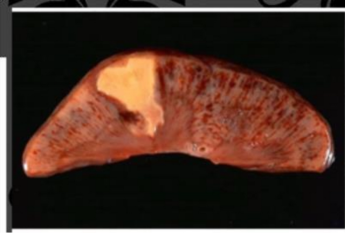


Mitral Valve Vegetation

أرثيف وأسئلة
مواقع على ال
hemodynamic



26) What's the pathologic condition?



- A) Pale infarction of kidney
- B) Caseous necrosis
- C) Liquefactive necrosis

ANSWER: A

29) All of these factors can cause lung infarction, EXCEPT:

- A) Heart failure
- B) Anemia
- C) Healthy lung
- D) Atherosclerosis

ANSWER: C

34) Nutritional edema occurs due to?

- A) Liver impairment
- B) Increase protein syn.
- C) Increase ingestion

ANSWER: A

36) Compact mass of blood element:

- A) Hemorrhage
- B) Embolism
- C) Thrombus

ANSWER: C

41) Cardiogenic edema-one is false?

- A) Venous congestion
- B) Renal impairment
- C) Liver impairment
- D) Atherosclerosis
- E) Hyperaldosteronism

ANSWER: E

2) Which of the following vitamins is crucial as a cofactor in the coagulation process? Select one

- A) Vitamin K
- B) Vitamin B12
- C) Vitamin C
- D) Vitamin D
- E) Vitamin E

ANSWER: A

4) One of the following pairs between the factors/cytokines involved in coagulation and their role is CORRECTLY matched? Select one

- A) ADP. Bridges between the platelet receptor glycoprotein Ib and exposed collagen
- B) Factor IXa /factor VIIIa complex: The most important activator of factor XII
- C) Thrombin: The most important plasminogen activator
- D) Thromboxane A2: A potent inducer of platelet aggregation
- E) Nitric oxide (NO): induce platelet activation and aggregation

ANSWER: D

6) One of the following is incorrect regarding the differences between hyperemia and congestion?

Select one:

- A) Congestion accumulates deoxygenated blood
- B) Both lead to increase blood volume within the tissue
- C) Hyperemia is a passive process resulting from arteriolar dilation.
- D) Congestion results from impaired outflow of venous blood from a tissue.
- E) Hyperemia is observed in condition associated with inflammation

ANSWER: C

7) One of the following pairs between the factor/receptor and the possible complication of its deficiency is wrongly matched?

Select one:

- A) Factor V Deficiency Moderate to severe bleeding disorder.
- B) Prothrombin deficiency: Incompatible with life.
- C) Factor XII deficiency Mild to Moderate bleeding disorder,
- D) GpIb-IIIa Deficiency Glanzmann thrombasthenia
- E) GpIb Deficiency Bernard-Soulier syndrome

ANSWER: B