

## Patho inflammation lec8

### Embolism

#### Definition:

An embolism is the lodging of an embolus inside a blood vessel. دخول كتله لا  
تذوب الي الاوعيه الدمويه خصوصاً الشرايين

#### Type of emboli:

**1- Detached part of a thrombus (thrombo-embolism):** كانت جزء من جلطه

Non-infected emboli lead to **infarction**, while infected ones lead to **pyemia** (septic emboli) causing multiple abscess

**2- Tumor emboli:** produce secondary deposits in distant organs known as metastasis.

( ورم ثانوي في الاعضاء خصوصاً (lung ,liver,brain,bone )

**3- Parasitic emboli:** spread of **bilharzial ova** leading to bilharzial granulation tissue and fibrosis in the liver or lungs. The **entameba histolytica** leads to amoebic liver abscess.

(This is specific chronic inflammation )

#### 4- Air emboli:

- This occurs in cut wounds in the neck or during brain surgery.  
Trauma to the lung and severe diving الغوص لعمق may also lead to air embolism.
- embolism may lodge in right of the **heart** preventing blood from passing to lung
- or lodge in the **pulmonary circulation** leads to pulmonary embolism and infarction.
- Arterial air embolism is more dangerous and pass directly to coronary or brain circulation causing myocardial infarction or stroke.

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**5-Fat emboli:** In fracture bone marrow , trauma to the soft tissue, burn and severe fatty liver, fat may enter into cut veins, leading to pulmonary embolism and infarction.

**6- Atheromatous emboli:** fragments from atheromatous plaque (كتلة من) (تصلب الشرايين) in the aorta leading to renal infarction and renal Failure. Infarction and gangrene in lower extremities الرجلين may also happen (purple toe syndrome). بتكون في صباع الرجل الكبير.

**7- Amniotic fluid emboli:** (السوائل حوالين الجنين) an amniotic fluid embolism is a rare obstetric emergency in which amniotic fluid, fetal cells, hair, or other debris enters the mother's blood stream اي بقايا انسجه ميتة بتخش الدم بتاع الام via the placental blood and triggers an allergic-like reaction. there is severe hemorrhage, respiratory failure, cardiovascular shock followed by convulsions تشنجات and coma.

### **Risk factors for embolism:**

1-Thrombus in any part of the body.

2- Atrial fibrillation, mitral stenosis, myocardial infarction and stroke.

3- Atherosclerosis, diabetes and hypertension.

4- Aneurysm حته ضيقه في الشريان

5-Prosthetic valves. صمام صناعي

**case:** a man goes through an accident and fractures a bone, a little after the accident he suffers from chest pain caused by embolism, 2 weeks after the accident he suffers again from chest pain due to embolism

1. First embolism was: fat embolism due to bone fracture
2. Second embolism was: thromboembolism due to thrombus

## Edema:

**Definition:** Its abnormal accumulation of fluids in the interstitium under the skin and serous sacs of the body

## Causes of edema

1. Increase in the permeability of the capillaries: inflammation and allergy
2. Increase in the venous pressure: thrombus, heart failure, liver cirrhosis  
تأليف الكبد
3. Decrease osmotic pressure of the plasma: protein loss in renal diseases, liver cirrhosis, malnutrition pregnancy disorders as preeclampsia البروتينات  
بتنزل مع البول
4. Lymphatic obstruction: inflammation, neoplasia. postsurgical and post irradiation
5. Sodium retention: excessive salt intake with renal insufficiency, increase activity of renin angiotensin system and increase secretion of adrenal hormones.  
الضغط بيزيد نتيجة تراكم الملح والمياه و الكلي يحصل فيها خلل في افراز الهرمونات

## Types of edema

- 1- Local edema: الجلد منفوخ في مكان محدد بس
- A. Inflammation
  - B. Venous congestion or obstruction
  - C. Lymphatic obstruction
  - D. Allergic edema (angioedema)

2-Generalized edema يكون الجسم كله منفوخ

A. Right side heart failure

B. Renal cause: Nephritic and Nephrotic syndromes

C-Hepatic cause: liver cirrhosis

D- Nutritional cause: protein malnutrition

**Pre-eclampsia (PE)** خلل في الحمل

**Definition:** is a disorder of pregnancy characterized by high blood pressure and often a large amount of protein in the urine.

لو حصل خلل في الحمل دا بيؤدي الي ان الضغط بيزيد و كمان البروتينات بتتزل مع البول فا دا بيسبب تراكم السوائل

**Clinical picture:**

The disorder usually occurs in the third trimester of pregnancy في الخلل دا بيكون في اخر ثلاث شهور في الحمل . In severe disease there may be red blood cell breakdown, a low blood platelet count ,impaired liver function, Kidney dysfunction, edema, shortness of breath due to fluid in the lungs, or visual disturbances. If left untreated, it may result in seizures at which point it is known as eclampsia(تشنجات).

**Risk factors:**

obesity, prior hypertension, older age,and diabetes mellitus. It is also more frequent in a-woman's first pregnancy and if she is carrying twins. يعني لو edema واحده حامل في توئم بتكون معرضه ان يحصل خلل في الحمل فا ينتج عنه

**Pathogenesis:**

1-abnormal formation of blood vessels in the placenta. Abnormal vascular development of the placenta leads to poor placental perfusion and poor trophoblastic invasion

بتكون مسؤله انها تجيب الدم من الرحم للمشيمه trophoblastic cells المشيمه بيكون فيها خلايا اسمها ischemia فا لما الخلايا دي بتبضعف بيحصل

2-It is thought that this results in oxidative stress يعني نقص الاكسجين hypoxia,

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and the release of anti-angiogenic proteins and inflammatory mediators that promote endothelial dysfunction, hypertension, inflammation

### Angioedema:

**Definition:** it is self-limited, asymmetric, localized non pitting edema

يعني لما بضغط عليها مش بتعمل حفرة او بصمه

Sites: periorbital, lips, tongue, extremity and bowel wall. جدار الامعاء.

Laryngeal edema is the main cause of death. علشان بتسد الحنجره فا بتوقف التنفس.

### Causes:

1- Idiopathic. مجهوله السبب

2- Allergic or IgE mediated نتيجة حساسيه

hypersensitivity reaction commonly from food or drugs.

3- Hereditary angioedema. وراثيه

4-ACE inhibitor angioedema

Transudate = افرازات مائيه

Exudates = افرازات التهابيه

### Differences between transudate and exudate

	Transudate	Exudates
1- protein content	Less than 1%	More than 3%
2- Aspect	Does not clot	May clot due to presence of fibrinogen.
3- Specific gravity	Less than 1015	More than 1015
4- Cells	Few or absent	Present in large numbers and their type depends on the type of inflammation.

الجدول دا حفظ

## Gangrene

**Definition:** it is necrosis of tissue due to insufficient blood supply with superadded putrefaction.

Gangrene ,usually starts by tissue injury and infection. Smoking and diabetes are common risk factors.

النسيج ييموت عشان الدم مش واصله كويس لا مش كذا بس دا كمان بيحصله عدوي بكتيرييه بتسبب تعفن للنسيج الميت

### Types of gangrene:

1. Dry gangrene.
2. Moist gangrene.
3. Gas gangrene.

#### Difference between dry and moist gangrene:

Point of comparison	Dry	Moist
Mode of onset	Gradual	Sudden
Site of gangrene	Limbs	Limbs and internal organs
Site of occlusion	Artery	Artery and veins
Cause of necrosis	Tissue anoxia	Tissue anoxia or toxins
Tissue fluids	Decreased	Increased
Size of affected part	Shrunken	Swollen
Line of demarcation	Well formed	Poorly formed
Toxemia	Mild	Severe
Course	Slow end in self-separation	Rapid and fatal

الجدول دا حفظ برضو

Line of demarcation: دا خط بي فصل بين النسيج الميت والنسيج السليم

Line of demarcation later becomes line of separation due to fibrosis



### Bed sores (pressure ulcer)

**Definition:** Damage, ulcer and moist gangrene of skin of the back due to prolonged recumbancy (bedridden).

#### Causes:

- 1-Paralysis and fractures in old age.
- 2- Postoperative periods
- 3- Atherosclerosis and diabetes.

Sites: It occurs over the sacrum, buttocks and upper back

**Pathogenesis:** the disease is caused by ischemia due to compression of skin blood vessels especially if complicated by atherosclerosis and diabetes. Pressure of the skin opposite the bony prominences leads cut of blood supply in the arteries of skin. Deep ulcers occur followed by anaerobic infection with necrosis of tissue and severe fatal toxemia and septic shock.

القرحة دي بتحصل بسبب الضغط المستمر علي الجلد يعني انت لو نايم لفترة طويله جداً مش بتقلب فا الضغط المستمر علي نفس المكان يقطع عنه الامداد الدموي فا النسيج يموت

#### Hemorrhage:

**Definition:** extravasation of blood due to rupture of blood vessels

### Gastrointestinal bleeding:

- **Hematemesis:**

It means vomiting of blood. The blood is fresh red or darker altered blood that may resemble ground coffee.

- **Melena:**

It is the passage of dark black, foul smelling stools due to digested blood in stool. so stool has dark color and strong odor

الدم بيطلع في البراز و بيكون راحته كريهه جداً

- **Rectal bleeding:**

It is the passage of fresh red blood from the rectum هنا بقا الدم هيطلع في الي فتحه (rectum) البراز بس لونه احمر مش غامق لان هنا الدم مش هيتهضم هيطلع من الشرج علي طول

- **Epistaxis:**

bleeding of nose

- **Hemoptysis:**

Coughing of blood

### Shock:

**Definition:** low blood perfusion of cells and tissue resulting in cell injury and inadequate tissue function

### Clinical picture:

1. Hypotension
2. Cold, pale, sweaty skin.
3. Rapid and weak pulse.
4. Oliguria.
5. Shallow rapid respiration.

### Types of shock:

- a. Hypovolemic shock due to severe hemorrhage, severe burns or severe dehydration. كميه الدم قلت
- b. Cardiogenic shock in myocardial infarction, rupture of a valve, and severe arrhythmia. ضعف القلب

C. Septic shock due to severe bacterial infection

صدمة صديدية بسبب البكتريا

d. Neurogenic shock due to spinal cord injury

صدمة عصبية

e. Anaphylactic shock due to antigen-antibody reaction

صدمة نتيجة الحساسية

### Disseminated intravascular coagulation (DIC)

**Definition:** DIC is a thrombo-hemorrhagic disorder that occurs as a secondary complication in a variety of diseases.

تجلط داخل الاوعية بشكل واسع

#### major disorders associated with DIC:

1. Obstetric complications:
  - Retained dead fetus
  - Septic abortion, amniotic fluid embolism
2. Infections especially gram -ve sepsis
3. Neoplasms:
  - o Mucin secreting adenocarcinoma
  - o Acute leukemia
4. Massive tissue injury as severe trauma and burns
5. Snake bite, shock, heat stroke, liver diseases

#### Pathogenesis of DIC:

- it begins with sudden onset of widespread fibrin thrombi in microcirculation causing diffuse circulatory insufficiency
- Associated with rapid consumption of platelets and coagulation proteins
- Fibrolytic enzymes are activated resulting initially in a thrombotic disorder which later evolves into severe bleeding disorder

يعني باختصار، المسببات التي فوق بتخلي جلطات كثير تتكون فهتخلص عوامل التجلط كلها، و لما تتكون

كنير الجسم هيطلع ضدها ال fibrolytic enzymes التي بتكسرهما فكد هيسبب في الاخر severe

bleeding disorder عشان الجلطات مش عارفة تتكون لما نحتاجها فعلا