

Fat Embolism

essay.
 {H/o femur fracture}
 collapse & died.

Q) diagnosis?

Q) etiology

Q) morphological & postmortem findings.

* Fat embolism refers to the presence of microscopic fat globules (sometimes with associated hematopoietic bone marrow) in vasculature after fracture of long bones or rarely in the setting of soft tissue trauma or burns.

Etiopathogenesis

Etiology

- long bone fractures (m/c)
- severe soft tissue trauma/burns
- vigorous CPR
- occurs in 90% of severe skeletal injuries. {but <10% have CF}

Pathogenesis

- mechanical obstruction.
- Biochemical injury.

Pathogenesis

Mechanical obstruction

- fat micro-emboli and associated red cells & platelet aggregates can occlude pulmonary & cerebral microvasculature.

Biochemical Injury

release of FFA from fat globules
 ↓
 local toxic injury to endothelium
 ↓
 platelet & granulocyte aggregation
 ↓
 exacerbates the situation.

* "fat embolism syndrome" is used for minority of patients who become symptomatic

Symptoms

① pulmonary insufficiency

• typically presents 1-3 days after injury
 ↓
 sudden onset of tachypnoea, dyspnoea, tachycardia

② Neurological Symptoms

- Irritability
- restlessness
- delirium
- coma.

③ Anaemia

- due to red cell aggregation & hemolysis.

③ Thrombocytopenia

- platelet adhere to fat globule
- splenic sequestration.

Air Embolism (S.N)

definition

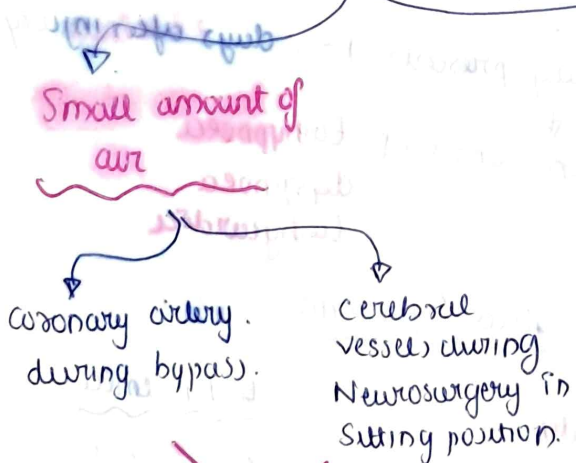
air embolism refers to the presence of gas bubbles within circulation, which can coalesce into frothy masses, obstruct vascular flow, and cause distal ischemic injury.

Etiopathogenesis

Etiology



air can enter the vasculature when there is a negative pressure gradient



Other consequences

- Mental Impairment (CF) ✓
- Sudden onset coma. (CF) ✓

Decompression Sickness

definition

Occurs when individuals experience sudden decrease in atmospheric pressure, leading to gas bubble formation in blood & tissues.

causes

- seen in Scuba divers
- deep sea divers
- underwater construction workers

mechanism

- air is breathed → ↑ amt of gas esp. N_2 dissolves in blood & tissue
- * at high pressure → ↑ N_2 dissolves in blood & tissue
- * rapid ascent (depressurization) → N_2 comes out of solution → forming gas bubbles.

large volume > 100 cc.

necessary to produce CF in pulmonary circulation

during obstructive / laproscopy procedures.

OR consequence of chest wall injury.

~ 350 - 500 ml

fatal. (CF) respiratory distress ✓

Amniotic fluid Embolism

Definition

- It is the 5th m/c cause of maternal mortality worldwide.
- ⇒ It is an ominous complication of labor or the immediate postpartum period.
- ⇒ mortality rate can be as high as 80%.

Clinical feature.

onset is characterized by:

- Sudden Severe dyspnea.
- Cyanosis
- Shock.

followed by Neurologic Impairment:

- Headache
- Seizures
- Coma

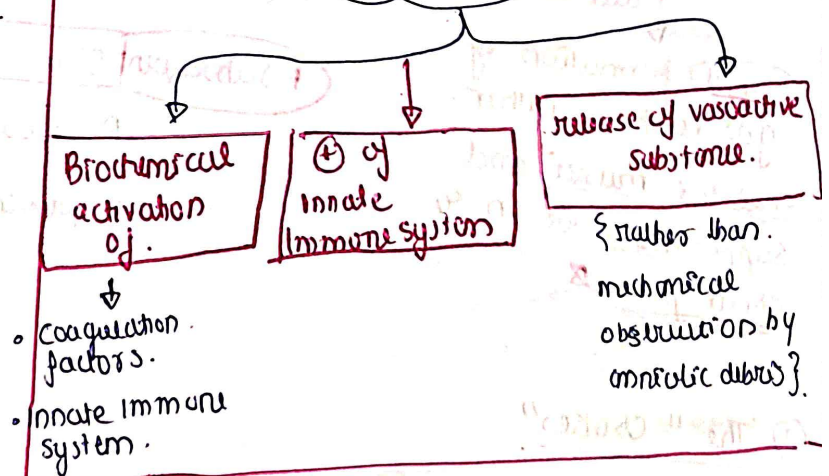
If the patient survives the Initial Crisis:

- pulmonary edema.
- DIC.

Pathogenesis

{ features of AFE differ from PE }
as it occurs due to.

Much of morbidity & mortality is due to.



Vasoactive substances

causes:

- ① Acute pulmonary HTN
- ② Right heart failure.
- ③ Left Heart failure
- ④ Pulmonary edema
- ⑤ diffuse alveolar damage.

Autopsy findings

- ① Squamous cells shed from fetal skin
- ② Larugo hair
- ③ Fat from Venous caseosa
- ④ mucus from fetal GIT / RT

in maternal pulmonary microvasculature.

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Clinical feature -

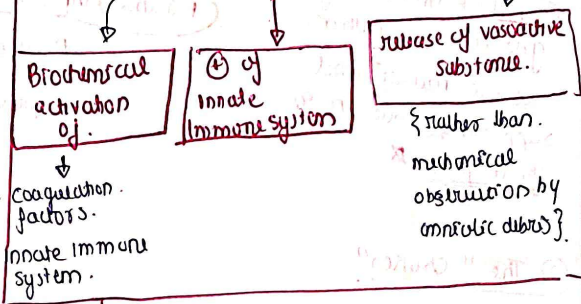
Onset is characterized by:

- Sudden Severe dyspnea.
 - Cyanosis
 - Shock.
- Followed by Neurologic Impairment:
- Headache
 - Seizures
 - Coma
- If the patient survives the Initial crisis:
- pulmonary edema.
 - DIC.

Pathogenesis

{ features of AFE differ from PE }
as it occurs due to.

Much of morbidity & mortality is due to.



underlying cause

↓
 effusion of amniotic fluid or fetal tissue.
 ↓
 into maternal circulation.
 ↓
 v/a
 ↓
 tear in placental membrane.
 • Rupture of uterine veins.

vasoactive substances

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- ① Squamous cells shed from fetal skin
 - ② Lanugo hairs
 - ③ Fat from venous caseosa
 - ④ mucus from fetal GIT/RT
- ↓
 in maternal pulmonary microvasculature.

Other findings

- Other findings:
- marked pulmonary edema.
 - diffuse alveolar damage
 - fibrin thrombi in many vasculature bed due to DIC.