Embolism

Q definition, types, etiopathogenesis, morphology, complications.

definition.

Q) An embolus is an intravascular solid, liquid, or gaseous mass that is carried by the blood to a site of distant from it's point of origin.

- Vast majority of emboli derive from a dislodge thrombus - hence the term — thromboembolism

TYPES

① pulmonary thromboembolism
② systemic thromboembolism.
③ Fat embolism
④ Air embolism
⑤ Amniotic fluid Embolism.

pulmonary embolism (m/c)

Origin

→ 95% of cases → venous thrombi from deep leg vein proximal to popliteal fossa.

→ thrombi from lower leg → rarely embolize.

Question - H/o

if PE → bedridden patient suddenly due to DVT. developed dyspnoea

Fat embolism → fracture of femur & other long bone.

Systemic thromboembolism → pt with h/o chest pain, palpitation, dyspnoea - later develops
→ hemiplegia (or)
→ infarction of major organ (any)

in consequence of systemic embolization ↓ is ischemic necrosis (infarction).

for pulmonary embolism. ↓ ⇒ hypoxia, hypotension, right sided heart failure

pathophysiology

. thrombi {usually DVT} ↓ fragment. ↓ travel via venous system. ↓ right heart ↓ pulmonary arteries.

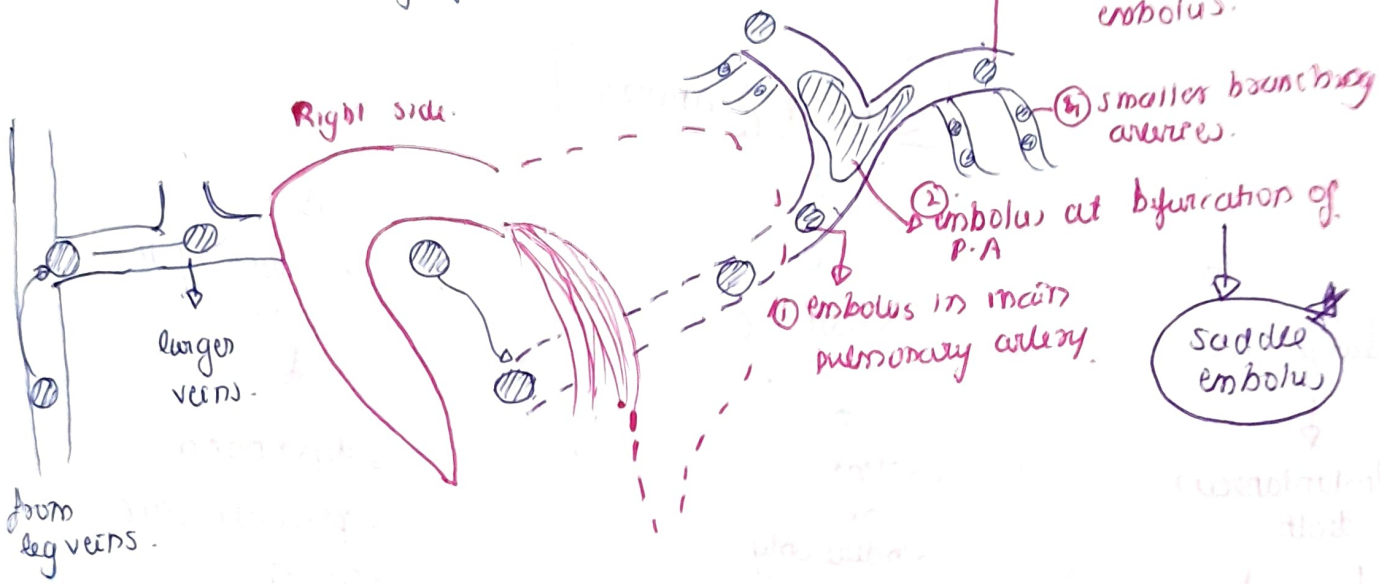
Sites of Embolus lodging.

① Occlude main pulmonary artery

② straddle the pulmonary artery bifurcation

③ pass out into smaller branching arteries.

④ left or right P.A embolus.



paradoxical embolism: Rarely Embolus bypass lung via cardiac defect → Enters systemic circulation.

Functional Consequences.

① most emboli are clinically silent
∵ they are small
↓
with time they organize & incorporate into vessel wall

② Sudden death, acute right heart failure; {cor pulmonale} or collapse.
} }
if emboli obstruct 60% or more of pulmonary circulation.

③ Embolic obstruction of medium-sized arteries and subsequent vascular ~~damage~~ rupture causes pulmonary hemorrhage
But no infarction ✗ due to dual blood supply to lungs.
↓ ↓
But in case of ♡ Failure and reduced Bronchial artery supply
↓
infarct.

④ Embolic obstruction of small end arteriolar pulmonary branches. does not often produce hemorrhage or necrosis.

⑤ multiple emboli overtime may cause pulmonary HTN & Right ventricular failure.

Clinical features

large PE
- Instantaneous death
- If patient survives
  - Severe chest pain
  - dyspnoea
  - shock

{mimic acute MI}

Small P.E
- Silent or
- Induce only transient chest pain & Cough.

In rest of the cases.
- dyspnoea.
- pleuritic pain
- cough
- calf/thigh swelling, pain.

Diagnosis
- d-dimer; screening.
- CT pulmonary Angiogram → definitive.
- for DVT → duplex USG.
- chest xray – wedge shaped infiltrates.

Rx
- anticoagulants
- thrombolytics.

Complications
- multiple small emboli
  - pulmonary hypertension & Cor pulmonale.

preventive measures

Prevention
- Early ambulation post-op & postpartum.
- Elastic stockings.
- Anticoagulants in high risk patients.
- mandatory stocking – bed ridden patients.

Systemic thromboembolism (UQ)

due to atrial fibrillation.

Essay.

→ H/o - chest pain, dyspnoea, palpitation.
↓
hemiplegia developed.

Q) Explain pathogenesis of dyspnoea.
Q) Why caused hemiplegia.

• outcome → tissue infarction

Systemic Thrombo Embolism / Arterial Emboli

80% arises from.
↓
Intra cardiac mural thrombi.

- (2/3) – arises in relation to left ventricular wall defect
- (1/4) – arises due to left atrial dilatation & atrial fibrillation.
- remaining –
  - aortic aneurysm
  - atherosclerotic plaque
  - valvular vegetation
  - Venous thrombi {paradoxical}

10-15%
↓
unk origin.

venous Emboli

↓
deposits in lung. {mainly}

Arterial Thrombus. Embol

↓
travel to various sites
↓
m/c – lower extremity (75%)
& Brain (10%)
other: kidney, spleen, intestine.
↓
toes

pathogenesis of dyspnea in STE

① Cardiac origin of Emboli

LV infarct, Left atrial thrombus.
↓
↓ CO
↓
Congestive heart failure.
↓
pulmonary congestion
↓
Edema.

② Paradoxical Embolism

- embolus from venous
↓
arterial system
↓
via patent foramen ovale.
↓
block pulmonary arteries.
↓
dyspnoea.

Hemiplegia in STE

Likely cause: Cerebral Infarction.
↓ due to
Embolus lodging in middle cerebral artery

pathogenesis.

- Embolus from LV thrombus, LA thrombus, aortic plaque.
↓
via carotid artery.
↓
MCA. : supplies motor cortex controlling opp face & upper limb.
↓
Infarction
↓
Sudden onset of hemiplegia → paralysis of opposite side.

these injuries rupture vascular sinusoids in marrow or small venules
↓
marrow & adipose tissue herniate to vascular space & reach lung

* autopsy finding
* fat emboli demonstration