

# Case scenario

- While you're on call, the nurse from the ward contacts you regarding the condition of the patient in room 12, who is experiencing sudden confusion.
- The patient is a 25-year-old male admitted to the ward two days ago due to fractures in his left femur and right tibia. He is set to undergo surgery the following day.
- Upon examination, he is lying in bed and shows signs of slight tachypnea. Additionally, you observe a petechial rash on his neck & chest.





What is on the top of your differential diagnosis list?

- Fat embolism syndrome

- Identify Fat embolism syndrome ?

- Fat Embolism Syndrome is an acute respiratory disorder caused by an inflammatory response to embolized fat globules that may enter the bloodstream as a result of acute long bone fractures or intramedullary instrumentation. Patients present with hypoxia, changes in mental status, and petechial rash

- Describe the pathophysiology of this disease ?



- Fat and marrow elements are embolized into the bloodstream during
  1. acute long bone fractures
  2. intramedullary instrumentation : intramedullary nailing hip & knee arthroplasty
- Two theories regarding the causes of fat embolism include
  1. Mechanical theory
    - embolism is caused by droplets of bone marrow fat released into venous system
  2. Biochemical theory
    - lipoprotein lipase induces free fatty acid production with resultant hyperinflammatory response similar to ARDS

- What are the systems most commonly affected?

- Most common manifestations are in respiratory system.
- It also can affect the brain, skin, kidney & liver

- What abnormalities in the vital signs are expected to be seen?

- Tachypnea
- Tachycardia
- Fever
- Hypotension
- Hypoxia (decreased O<sub>2</sub> sat)

- What laboratory tests have been proven to be helpful in confirming your diagnosis?

- Usually **none** are helpful, but can aid to exclude other causes.

- How to manage this Case ?



- In order to minimize the risk of developing this disorder, **Early fracture fixation** (*early fracture stabilization (within 24 hours) of long bone fracture is most important factor in prevention of FES*)
- But if developed, then management will be Supportive treatment as : IV fluids , Oxygen supplementation & transfer to ICU if unstable
- No role for pharmacological interventions

- How to differentiate from Pulmonary embolism ?

1. CXR (usually normal, may show a prominent hilum)
2. Chest CTA is diagnostic for filling defects associated with PE
3. Mental status deterioration , confusion and petechial rash are related to fat embolism rather than PE
4. PE has to be managed pharmacologically using heparin & warfarin, while fat embolism is managed supportively

- Thank you