Department of Anesthesia Techniques
Title of the lecture:- DISEASES OF RESPIRETORY SYSTEM
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DISEASES OF RESPIRETORY SYSTEM

2-Tuberculosis:

Is caused by infection with Mycobacterium tuberculosis (MTB), it is the second most common cause of death due to an infective disease.

Pathology and pathogenesis:-

-Spread: by the inhalation of aerosolized droplet nuclei from other infected patients.

-Tuberculous granuloma: Once inhaled, the organisms lodge in the alveoli and initiate the recruitment of macrophages and lymphocytes. Macrophages undergo transformation into epithelioid and Langhans cells, which aggregate with the lymphocytes to form *TB granuloma*, Numerous granulomas aggregate to form *a primary lesion*.

-Primary complex of Ranke: combination of the primary lesion with the affected regional lymph nodes .

- Latent TB: Reparative processes encase the primary complex in a fibrous capsule, limiting the spread of bacilli.

Factors increasing the risk of TB
Patient-related
• Age (children > young adults < elderly)
• Close contacts of smear-positive patients; worse in overcrowding, e.g. prisons, dormitories
• CXR evidence of self-healed TB
• Primary infection <1 year previously.
• Tobacco use
Associated diseases
• Immunosuppression: HIV, high-dose glucocorticoids,
• Malignancy (especially lymphoma and leukaemia)
• Type 1 diabetes mellitus
• Chronic kidney disease
• GI disease with malnutrition (gastrectomy, bypass, pancreatic cancer, malabsorption)
• Deficiency of vitamin D or A
• Recent measles in children

Clinical Features:

A -Primary pulmonary TB:

Infection of a previously uninfected patient (tuberculin-ve). Almost always the patient is asymptomatic. A few patients develop a self-limiting febrile illness

Miliary TB:

Due to Blood-borne dissemination , is characterised by 2–3 weeks of fever, night sweats, anorexia, weight loss and a dry cough .The classical appearances on CXR (‘millet seed’) distributed throughout the lung fields.

Post-primary pulmonary TB:

exogenous (‘new’ infection) or endogenous (reactivation of a dormant primary earlier exposure. It is characteristically occurs in the apex of an upper lobe. The onset is usually insidious, developing slowly over several weeks.

Systemic symptoms include fever, night sweats, malaise, and loss of appetite and weight, and are accompanied by progressive pulmonary symptoms.

- Chronic cough, often with haemoptysis
- Pyrexia of unknown origin(PUO)
- Unresolved pneumonia
- pleural effusion
- Weight loss, general debility
- Spontaneous pneumothorax

Diagnosis:

The presence of an otherwise unexplained cough for more than 2–3 weeks, particularly in regions where TB is prevalent, or typical chest X-ray changes should prompt further investigation.

Specimens required.

Pulmonary

- Sputum*: At least 2 but preferably 3, including an early morning sample.
- Bronchoscopy with washings

Extrapulmonary

- Fluid examination (cerebrospinal, ascitic, pleural, pericardial, joint): yield classically very low.
- Tissue biopsy (from affected site): bone marrow/liver.

Diagnostic tests:

• Tuberculin skin test
• Stain (Ziehl–Neelsen ,Auramine fluorescence)
• Nucleic acid amplification
• Culture :Solid media ,Liquid media
• Pleural fluid: adenosine deaminase
• Response to empirical antituberculous drugs (usually seen after 5–10 days).

Baseline blood tests:

• CBC, CRP, ESR, RFT and LFTs

Treatment:

based on the principle of an initial intensive phase (4 drugs HR+ZE) to reduce the bacterial population rapidly, followed by a continuation phase (2 drugs HR) to destroy any remaining bacteria. Standard treatment involves 6 months isoniazid (H) and rifampicin (R). supplemented in the first 2 months with pyrazinamide (Z)and ethambutol (E).

PULMONARY VASCULAR DISEASE:

Pulmonary embolism / Acute massive pulmonary embolism

80% of PE arise from the propagation of lower limb DVT.

Risk factors for venous thromboembolism:

-Surgery (Major abdominal/pelvic surgery Hip/knee surgery Post-op intensive care).
-Obstetrics (Pregnancy/puerperium).
-Cardiorespiratory disease (COPD ,CHF) -Lower limb problems (Fracture ,Varicose veins,CVA/SC injury).
-Malignant disease (Abdominal/pelvic Advanced/metastatic Concurrent chemotherapy).
-Miscellaneous Increasing (age, Previous proven VTE,Immobility ,Thrombotic disorders ,Trauma).

Clinical features:

1- Major haemodynamic effects: ↓cardiac output; acute right heart Failure.
2- Faintness or collapse, crushing central chest pain, apprehension, severe dyspnea.
3- tachycardia, hypotension, severe cyanosis, ↓urinary output

4- Chest X-ray Usually normal.

5- Arterial blood gases Markedly abnormal with ↓PaO2 and ↓PaCO2.

Investigations:

1-CXR: most useful in excluding key differential diagnoses, e.g. pneumonia or pneumothorax.

2 -CT pulmonary angiography is the first-line diagnostic test.

3- ECG is often normal .The most common findings in PE include sinus tachycardia.

4-ABG: typically show a reduced PaO2 and a normal or low PaCO2.

5-D-dimer elevated D-dimer is of limited value, as it may be raised in a variety of conditions including PE, myocardial infarction, pneumonia and sepsis. , low levels, particularly when clinical risk is low, have a high negative predictive value.

Treatment:

1-Oxygen For hypoxaemic patients.

2-External cardiac massage may be successful in the moribund patient by dislodging and breaking up a large central embolus.

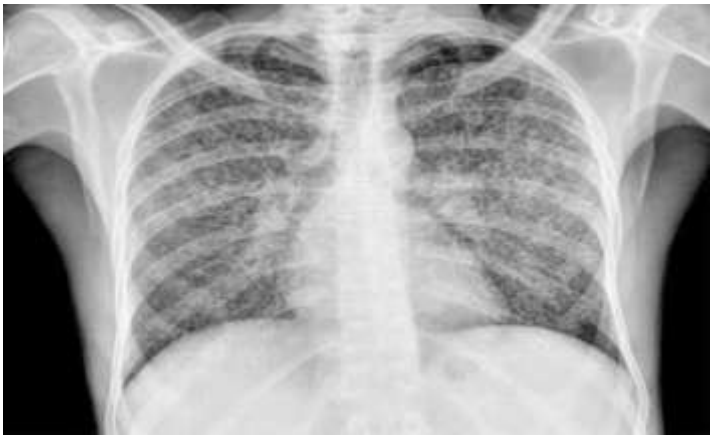
3- Anticoagulation :examples: Heparin and warfarin

4-Thrombolytic and surgical therapy: Thrombolysis is indicated in any patient presenting with acute massive PE accompanied by cardiogenic shock, example :alteplase

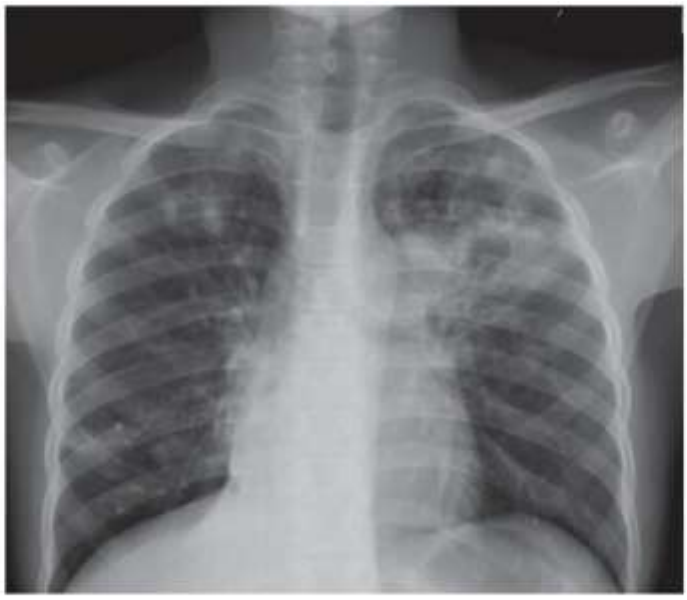
5-Caval filters: indicated in patients with recurrent PE despite adequate anticoagulation or in whom anticoagulation is contraindicated .

PRACTICAL:

MILIARY TB (The classical appearances on CXR ‘millet seed’ distributed throughout the lung fields)



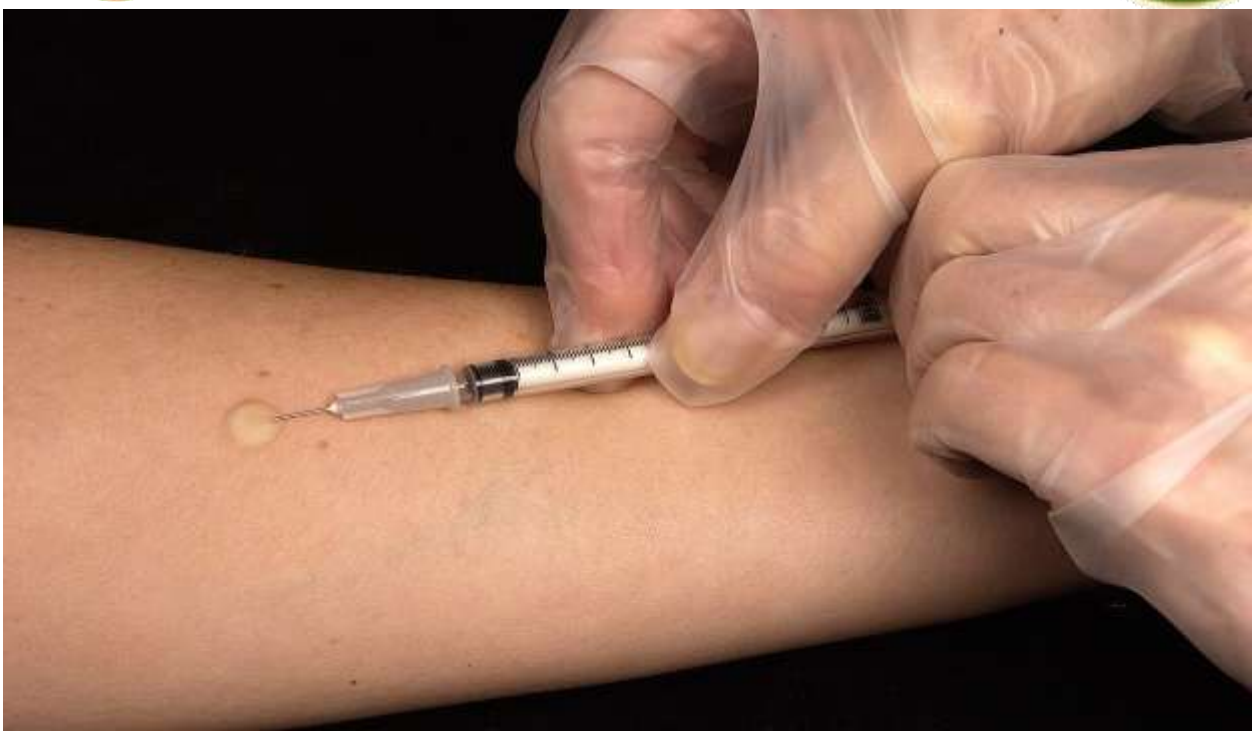
PULMONARY TB characteristically occurs in the apex of an upper lobe.



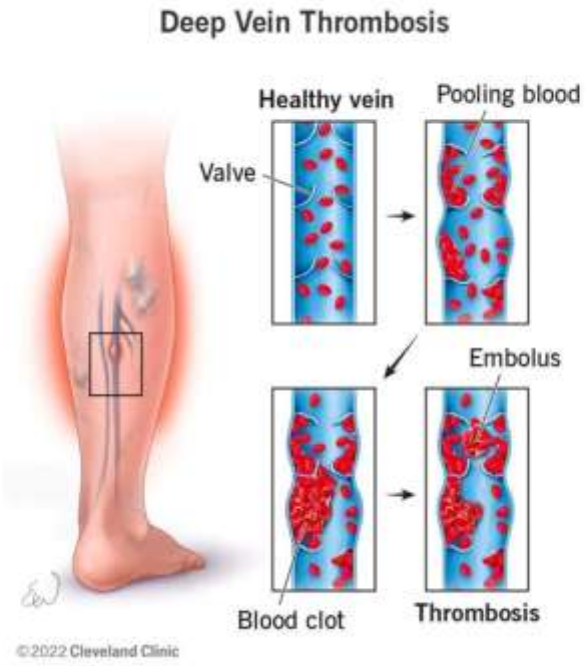
Pulmonary TB

Tuberculin skin test:

A tuberculin skin test (TST) is a two-visit medical test to screen for tuberculosis (TB) infection. It involves a healthcare provider injecting a small amount of tuberculin solution into the forearm's skin on the first visit. On the second visit, two to three days later, the provider measures any swelling (induration) to determine a positive or negative result. A positive result indicates the person has TB germs in their body, but further tests like a chest X-ray are needed to see if the infection is latent or active. ***Induration of ≥15 mm is considered positive.***



(80% of PE arise from the propagation of lower limb DVT)



CT pulmonary angiography is the first-line diagnostic test for PULMONARY EMBOLISM