

TUBERCULOSIS AND VENOUS THROMBOEMBOLISM- CASE SERIES

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PRESENTATION OF CASE

Tuberculosis (TB) is one of the deadliest communicable diseases. India alone is accounting for one third of total TB cases.¹ Venous thromboembolism (VTE) is a rare complication of TB, but it may be a potentially life-threatening event.² Lack of awareness regarding this association may be responsible for the condition being unrecognised. Despite TB being prevalent in India, data on the association with VTE is lacking. We report three cases of pulmonary TB (PTB) and one case of extra pulmonary TB associated with VTE.

CASE REPORTS

Case 1

Presentation

A 45-year old male, presented with complains of cough with expectoration since two months, fever and anorexia since one month. On examination he was febrile, tachycardic. Chest examination revealed left sided crepitations.

DIFFERENTIAL DIAGNOSIS

Investigations

ESR - elevated (80 mm/hr) Haemoglobin (Hb) - 10.4 gm/dl Platelets - 2.4 lakh cells WBC count - 5900 cells sputum AFB 2+ positive Chest X-ray PA showed bilateral (B/L) infiltrations and left cavitary lesion (Figure-1).

Course- Patient was started on anti-tubercular treatment (ATT). After two days patient developed pain in the left lower limb. On examination- Tenderness of the calf, swelling of left lower limb present, peripheral pulses felt. Lower limb venous Doppler showed deep vein thrombosis (DVT) - left leg with D-Dimer levels- elevated (5.20 ug/ml).

CLINICAL DIAGNOSIS

Diagnosis- Pulmonary tuberculosis with left lower limb deep vein thrombosis.

Patient was started on Low molecular weight heparin (LMWH) - 1 mg/kg bd wt and continued ATT. Patient showed

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gradual improvement and was later switched to oral warfarin.

Case 2

Presentation- A 23-year old female came with complains of fever with chills and evening rise of temperature since one month. Cough with yellowish expectoration, loss of appetite since 15 days. Swelling of right lower limb since five days.

On examination Pallor, right pitting pedal oedema with shiny skin, redness, tenderness present. Patient was febrile, tachycardic, SpO₂: 85% at presentation. Chest revealed B/L crepitations.

PATHOLOGICAL DISCUSSION

Investigations- Haemogram- normal sputum AFB - positive (3+) Chest X-ray showed bilateral infiltrative lesions and multiple cavitary lesions in both lung fields.

D-dimer - elevated.

Lower limb venous Doppler showed right side DVT.

Diagnosis- Pulmonary tuberculosis with right lower limb deep vein thrombosis.

Treatment- Patient was started on ATT and LMWH simultaneously and showed improvement.

Case -3

Presentation- A 58-year old male, presented with productive cough, anorexia since two months and painful swelling of the left lower limb since 15 days.

On examination he was poorly built, and nourished, febrile, and left leg was swollen and tender and all peripheral pulses felt. Chest auscultation was normal.

Investigations

Haemoglobin - 11.2 gm/dl

Platelets - 2.9 lakh cells

WBC Counts - 9700 cells

Sputum AFB - positive (1+)

Chest X-ray showed infiltrations in both lungs

Lower limb venous Doppler showed Left leg DVT.

Diagnosis- Pulmonary tuberculosis with left lower limb deep vein thrombosis.

Treatment- Patient was started on ATT and LMWH simultaneously.



Case -4

Presentation- A 20-year old male, presented with complains of cough since one month associated with right pleuritic chest pain, intermittent fever and evening rise of temperature, anorexia since one month.

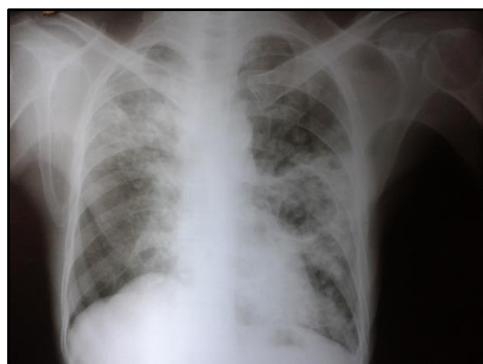
On examination vitals were stable, Chest auscultation revealed decreased breath sounds in right inter and infra scapular, infra axillary areas.

Investigations- Chest X-ray showed Right sided pleural effusion (Figure- 2), haemogram was normal. Sputum AFB– Negative. Pleural fluid analysis– Exudative with Lymphocyte predominance Pleural fluid ADA – Elevated.

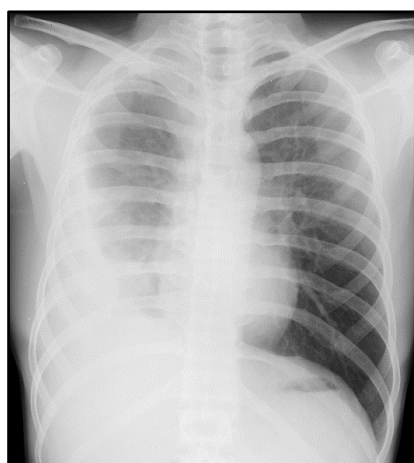
Course- Patient was started on ATT. After five days of ATT patient complained of sudden onset of pain abdomen. Ultrasound abdomen showed large irregular inferior vena caval thrombus. D-Dimer and cardiac enzymes were elevated. 2D-Echo showed dilated right chambers, PASP- 54 mmHg. ECG showed S1Q3T3 Changes (Figure-3) suggestive of pulmonary embolism.

Diagnosis- Right sided tubercular pleural effusion with pulmonary embolism.

Treatment- Patient was started ATT and LMWH, switched over to oral warfarin.



**Figure 1. Chest radiograph PA view-
Left cavitory lesion**



**Figure 2. Chest radiograph PA view-
Right pleural effusion**

PATHOLOGICAL DISCUSSION

Tuberculosis (TB) is a chronic infectious disease and causes a variety of complications, some of which may be life-threatening. Local pulmonary complications are frequently seen, but systemic complications like vascular and haematological abnormalities are uncommon in TB. VTE is clinically observed and confirmed in 3–4% of patients with PTB³. Robson et al., found 35 patients with PTB and DVT, In 33 of them, DVT occurred 7 days after the diagnosis of TB, and in two DVT was the presenting feature.⁴ Some reports demonstrated that the embolism in patients with TB can occur in other sites like hepatic veins, inferior vena cava.⁵ pulmonary veins, cerebral venous sinuses.^{6,7,8,5} According to a retrospective analysis in a South African Hospital, White et al. stated that DVT rate was 3.4% within the first two weeks after initiation of therapy. Ambrosetti et al., performed a nationwide prospective study comprising a routine evaluation of treatment outcomes in TB patients and concluded that the prevalence of VTE was 0.6% in the first month of treatment with one third occurring in the first week.² Similar observations were made by Turken et al. in a case control study, regarding the haemostatic disturbances in patients with PTB. They also stated that these changes improve with ATT within 4 weeks.⁹ TB has several mechanisms that can lead to thromboembolic complications. The high level of plasma fibrinogen, impaired fibrinolysis associated with a decrease in antithrombin III, protein C induce a hypercoagulable state.^{3,4,9} Cytokines because of their pro-inflammatory effect, will activate the vascular intimal layer and make the endothelium thrombogenic, and also lead to stimulation of hepatic synthesis of coagulation proteins.¹⁰ These risks of hypercoagulability are also increased by the immobility. Vascular complications associated with infection by mycobacterium have been reported in 1.5–3.4% of TB.⁸ There is direct endothelial damage promoted by the tubercle bacillus, and by rifampicin. In patients treated with rifampicin containing regimens there is a relative risk of 4.74 for developing DVT.³ This does not contraindicate the use of the drug in patients at risk, but such patients should be monitored. There can also be stasis due to local compression of veins by lymph nodes. Retroperitoneal Lymphadenopathy can cause thrombosis in the inferior vena cava.⁵ To conclude, tuberculosis being able to affect all the three components of the Virchow's triad, could be a significant risk factor for VTE and these clinical reports also support the evidence.

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