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A Rare Case of Disseminated Tuberculosis in an Immunocompetent Adult: Diagnostic and Therapeutic Challenges

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Abstract: ***Tuberculosis (TB) is a contagious, chronic, infectious disease caused by Mycobacterium tuberculosis, which primarily affects the lungs but can disseminate to other organs. The WHO estimated that 10.6 million cases of TB occurred worldwide in 2022, 97% of them in low- and middle income countries. Tuberculosis (TB) is a major health problem in India, which accounts for about 28% of global TB cases, with an estimated 2.8 million new cases and 3.3 lakh deaths in 2022. Disseminated TB, a severe form involving multiple organs or the bloodstream, is more common in immunocompromised individuals and can involve the liver, spleen, bone marrow, and central nervous system. Represents 10–15% of extrapulmonary TB cases. It often presents with non-specific symptoms, making diagnosis difficult, but early treatment significantly improves outcomes. In this case report, we present a case of 41 years old female patient presented with breathlessness and abdominal distention who was diagnosed with disseminated TB.***

Keywords: TB Meningitis Sequelae, Disseminated Tuberculosis, Tuberculosis Pleural Effusion, Reactivated TB, Omental Thickening

1. Introduction

Tuberculosis (TB) is a chronic infectious disease caused by Mycobacterium tuberculosis, primarily affecting the lungs but capable of involving almost any organ system. It spreads through inhalation of aerosolized droplets from an infected person and remains a significant global health burden, especially in developing countries and among immunocompromised individuals such as those with HIV/AIDS, diabetes, or malnutrition. Once inhaled, the bacilli reach the alveoli, where they are engulfed by macrophages.

However, the bacteria evade destruction by inhibiting phagosome-lysosome fusion and resisting intracellular killing, allowing them to survive, replicate, and disseminate via lymphatic and hematogenous routes. In most healthy individuals, a granulomatous immune response contains the infection as latent TB.

Disseminated TB, or miliary TB, occurs when the immune response fails to localize the infection, resulting in widespread hematogenous spread of the bacilli. It can arise during primary infection or reactivation of latent foci, especially in immunocompromised patients. Clinical manifestations are typically nonspecific, including prolonged fever, weight loss, night sweats, and fatigue, along with organ-specific signs such as hepatosplenomegaly, lymphadenopathy, or neurological symptoms. Radiographic imaging often reveals a classic "miliary" pattern in the lungs. Pathologically, the disease is characterized by numerous poorly formed or necrotic granulomas in multiple organs. The prognosis depends on early diagnosis and prompt initiation of treatment; however, delayed recognition and underlying immunosuppression are associated with a higher risk of complications and mortality.

2. Case Report

A 41 year old female presented with abdominal distension since 2 week , breathlessness since 1 week , which was aggrevated on left lateral position, and fever since 2 days . History of weight loss present. No history of chest pain, palpitations, orthopnea , PND lower limb swelling, cough with expectation, hemoptysis, burning micturition, decreased micturition. She was known case of TB MENINGITIS, diagnosed 15 years back and taken treatment and know case of seizure disorder and on treatment. Not a know case of Diabetes, Hypertension, Bronchial asthma, ischemic heart disease, Thyroid dysfunction. On general physical examination, moderately built and nourished her BP was 126/80mmhg, PR - 86bpm, sp02 - 89%on RA →96% on 4 liter of O2, Temp - 101.3ºF. She had mild pallor.

Systemic examination:
Per abdomen: soft, distended, tenderness in the right hypochondriac region, no guarding, rigidity, radiating pain.

Respiratory system: Trachea central. Decreased air entry in the right and left mammary, infra mammary, axillary, infra axillary, infra scapular region. Stony dullness on percussion in those regions on both sides. Reduced breath sounds & vocal resonance.

Investigations
CBC, RFT, SERUM ELECTROLYTE - WNL ESR - 36

Urine protein - 1+, pus cells - 12-14 /hpf

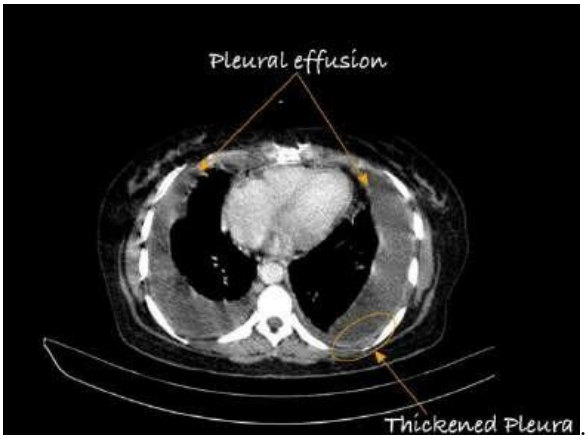
GGT - 281, ALP- 445, Total protein- 5.1g/dl, serum albumin- 2.7 gm/dl, Urine albumin- 28mg/dl, urine creatinine - 16.9 mg/dl

Pleural fluid analysis
Colour - reddish, clarity - turbid, Total WBC count - 570 cells/cumm,
Neutrophils - 40%, Lymphocytes - 60% Negative for malignant cells.

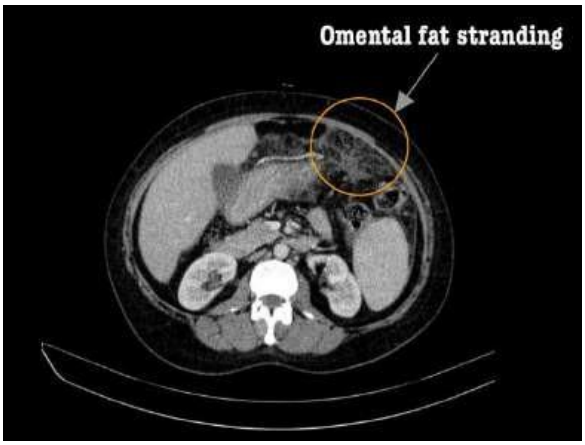
Plural LDH - > 1000, Protein - 3.9 gm/dl, ADA - 45U/L

Chest x-ray - Posterioanterior view of chest x-ray showing, B/L Pleural Effusion.

CECT Abdomen and Pelvis: Diffuse greater omental fat stranding with loculated ascites, left renal scar and loculated pleural effusion – To consider Koch's etiology. Hepatosplenomegaly, calcification granuloma in segment 7.



Selected selection axial CT image in mediastinal window shows moderate to gross loculated pleural effusion on both sides with thickened pleura.



Selected axial section CT image venous phase shows diffuse omental fat stranding involving the greater omentum with no obvious peritoneal thickening

Axial coronal sagittal ct images of the abdomen and pelvis in the venous phase shows renal scar in the interpolar region of the left kidney.

USG THORAX: Left gross and right moderate pleural effusion causing passive collapse of underlying lung.

Hence diagnosis of disseminated TB- Abdominal TB and Pleuroparenchymal TB was made. Patient was started on Anti tubercular therapy as per RNTCP guidelines and discharged.

3. Discussion

Tuberculosis (TB) continues to represent a major global health burden, with India accounting for approximately 26% of the worldwide TB incidence. Disseminated TB, a severe manifestation characterized by hematogenous spread of Mycobacterium tuberculosis to two or more non-contiguous organs, remains a diagnostic challenge due to its varied and often nonspecific clinical presentations. It may arise due to progressive primary infection, reactivation of a latent focus, or, less commonly, through iatrogenic transmission.

The index patient, a 41-year-old female with a prior history of TB meningitis and seizure disorder, presented with progressive dyspnea, positional breathlessness, abdominal distension, and febrile episodes. Constitutional symptoms, such as fever and pallor, and signs of systemic involvement—hypoxia, hypoalbuminemia, and mildly raised transaminases—reflect the multi-organ burden of disease. The presence of bilateral pleural effusion, ascites with omental stranding, a renal scar, and calcified granuloma on imaging was strongly suggestive of disseminated or reactivated TB. The pleural fluid analysis demonstrated an exudative, lymphocyte-predominant effusion with elevated ADA levels, a pattern commonly associated with tubercular etiology.

Disseminated TB often presents with non-specific symptoms and poses a diagnostic challenge, particularly in the absence of classical pulmonary findings. The imaging findings in this patient of omental stranding and calcified granulomas point toward chronic or reactivated disease, potentially stemming from latent foci seeded during prior infection. This aligns with established pathophysiology, where granulomatous inflammation leads to necrosis and fibrosis across multiple organ systems.

Notably, TB can present with hematological abnormalities such as anemia and hypoalbuminemia. These findings, while nonspecific, should raise suspicion of disseminated involvement, particularly in endemic settings. Hypoxia in this case warranted oxygen therapy, possibly reflecting underlying parenchymal involvement or significant extrapulmonary fluid burden compromising ventilation.

This case underscores the importance of maintaining a high index of suspicion for TB reactivation in patients with a prior TB history presenting with systemic and respiratory symptoms, especially when imaging and fluid analysis point toward a granulomatous etiology.

4. Conclusion

Disseminated tuberculosis remains a formidable diagnostic challenge due to its non-specific presentation and multisystem involvement. This case highlights the critical importance of clinical vigilance, particularly in patients with a prior history of TB. A constellation of systemic symptoms, supportive imaging findings, and characteristic fluid analysis should prompt early consideration of disseminated or reactivated TB. Timely recognition and treatment are essential to mitigate morbidity and prevent complications

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