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CASE REPORT

Coexistent Tuberculosis of Spine and Chronic Myeloid Leukemia: Resolving the Diagnostic Dilemma and Management

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ABSTRACT

Tuberculosis (TB) and association with hematological malignancy is well described in literature. Lymphoid malignancies like non-Hodgkin lymphoma and chronic lymphocytic lymphoma (CLL) are documented but chronic myeloid leukemia (CML) is uncommon. The association of TB and malignancy can be sequential, concurrent or masquerading. We encountered a case posing diagnostic challenge between CML and tuberculosis. The objective to report such a clinical situation is to be aware of such rare possibilities, to analyze the diagnostic methods and subsequent management strategies.

Though tuberculosis is usually the first differential diagnosis in endemic areas, it can be overstressed upon and other concurrent pathologies may be missed. Such possibilities should be kept in consideration in cases with poor response or clinical deterioration on antitubercular treatment (ATT). The importance of tissue diagnosis by CT-guided core biopsy as current standard of care is reiterated even in prevalent regions. Multidisciplinary approach is must for optimum outcome.

Keywords: Tuberculosis, Leukemia, Myeloid, Myeloproliferative.

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INTRODUCTION

Tuberculosis (TB) and malignancy are two separate entities. Association of TB with neoplastic conditions is well described in literature.[1] As far as hematological malignancies are concerned, lymphoid malignancies like non-Hodgkin lymphoma (NHL) and chronic lymphocytic lymphoma (CLL) are described with TB but not chronic myeloid leukemia (CML).[2] We encountered a case posing diagnostic challenge between CML and TB. The objective to report such a clinical situation is to be aware of such rare possibilities, to analyze the diagnostic methods and subsequent management strategies, and assessment of further clinical course of both the pathologies.

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CASE REPORT

A 45-year-old farmer from a village of New Delhi, presenting to the outpatient department of our institution with mid-backache for past 1 year and bilateral lower limb weakness for past 4 weeks was investigated. On clinical examination, there was no swelling or fullness but diffuse tenderness was present over dorsal spine. Motor power in lower limbs was medical research council grade II. His routine hematology investigations showed total leukocyte count $12 \times 10^3/mm^3$, erythrocytic sedimentation rate 60 mm/hr and C-reactive protein 4.3 gm/l. Other parameters were normal. Initial spine radiographs were insignificant (Fig. 1). Magnetic resonance imaging (MRI) evaluation showed paradiscal involvement of D9 and D10 with cord compression, with pre- and paravertebral abscess formation in dorsal spine level D8 to D12 (Fig. 2). Antitubercular treatment (ATT) was started and he was regularly followed up. Biopsy was not done before starting ATT as TB is very common in this region which falls in the endemic zone of TB for which we routinely rely on clinic-radiological diagnosis. Since he deteriorated neurologically despite on ATT for subsequent 6 weeks,

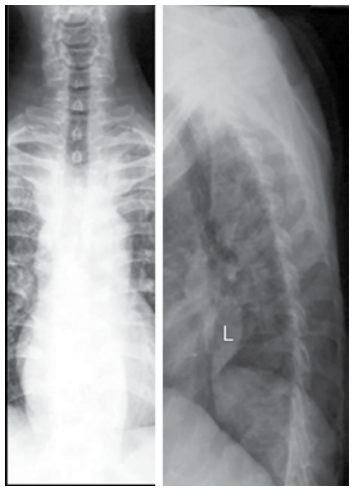

Fig. 1: Preoperative radiographs: Anteroposterior (AP) and lateral views

surgical decompression was planned. He was evaluated again after admission. His total leukocyte counts were found to be elevated ($>1 \times 10^5/mm^3$) and peripheral blood smear showed blast cells of myeloid origin. Hematology evaluation lead to diagnosis of CML. Chromosomal analysis showed BCR-ABL reciprocal translocation between chromosome 9 and 22. He was started on hydroxyurea 1 gm per day. Gradually, cell-count dropped to $20 \times 10^3/mm^3$, and posterior decompression and stabilization was done with pedicle screw-rod system after 2 weeks after discussing with the hematologist. Frank pus was drained intraoperatively (Fig. 3). Tissue specimens sent for histopathology showed granulomatous reaction with caseation necrosis confirming TB (Fig. 4). Antitubercular treatment was continued and, at the end of 3 months after surgery, patient improved neurologically (MRC grade III) and back pain improved. Postoperative radiographs were satisfactory (Fig. 5).

DISCUSSION

The risk of TB is increased in malignancies. This is due to decrease in immunity because of steroid treatment or dysfunction of immune system in lymphomas. The association of TB and malignancy may be one of the three types: sequential, concurrent or masquerading.[3]

Usually, lymphoid malignancies, most commonly non-Hodgkin lymphoma and CLL are associated with TB. But, CML, which is a myeloproliferative disorder arising from hematopoietic stem cell or early progenitor cell, as a predisposing factor for TB carries little evidence.[4]

Yeshurun et al (2002) reported a case of spinal cord compression due to multiple myeloma and spinal tuberculosis.[5] In study by Silva et al (2005), TB was most commonly associated with NHL and CLL. Only a single case of development of TB was described among 45 CML cases.[4] Study by Kamboj (2006) also revealed highest association of TB with blood cancers like NHL, Hodgkin lymphoma and in immunocompromised stem cell transplant recipients.[1]

Falagas et al (2010) in a review analyzed 47 cases with coexistent TB and malignancy. In their study, common sites for TB were lymph nodes, lung, colon and mammary glands. Most common associated malignancies were hematological, metastatic breast cancer, tumors of gastrointestinal tract, lung cancer and thymic carcinoma. The treatment for malignancy and TB was as per standard practices. Malignancy imitated TB in 17 cases. Clinically, TB was suspected but histology revealed tumor. In only one of these cases, Hodgkin's lymphoma resembled spinal abscess. Diagnosis was established by histopathology. They also reviewed 17 reports of malignancy imitating tubercular infection and 89 reports of TB resembling malignant growths.[3]

Jutte et al discussed causes of diagnostic pitfalls of spinal TB leading to inappropriate management with radiotherapy in two cases.[6] Various authors have appreciated the problems in distinguishing neoplasia and TB based on MRI.[7,8]

Chronic inflammatory conditions predispose to rapid cell turnover and risk of malignancy. Tubercular mycobacteria can cause DNA damage. It may increase BCL-2 synthesis leading to amplified antiapoptotic activity.[9,10] Velmurugan et al described virulence gene nuoG in *Mycobacterium tuberculosis* inhibiting apoptosis (programed cell death) and consequently predisposing to malignant cell growth.[11]

Daniels et al (2009) reported three cases of TB—two pulmonary TB and one spinal TB, in patients on imatinib

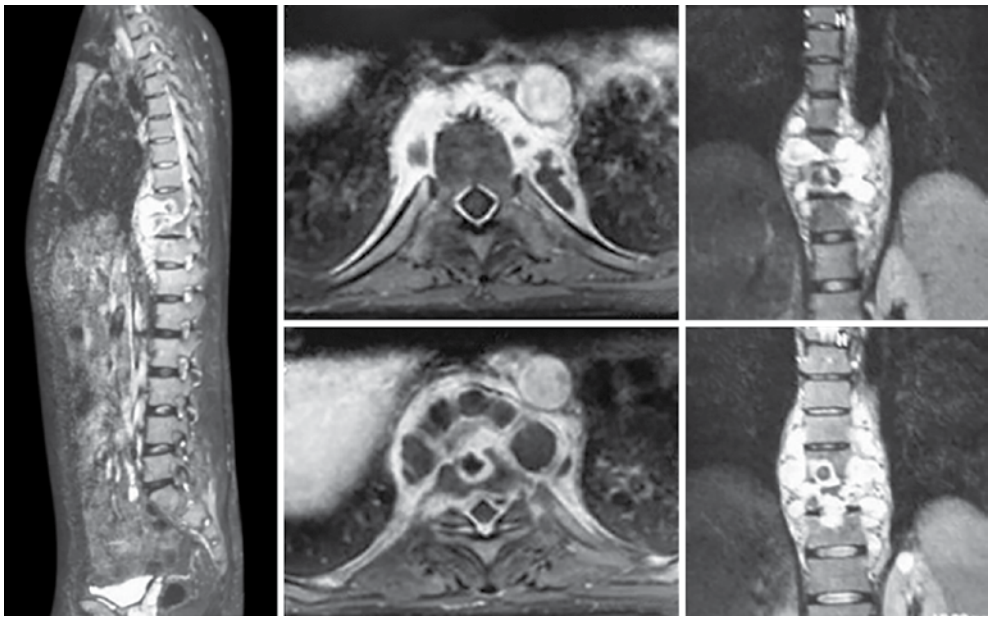

Fig. 2: Magnetic resonance imaging images showing the paradiscal involvement and extent of abscess

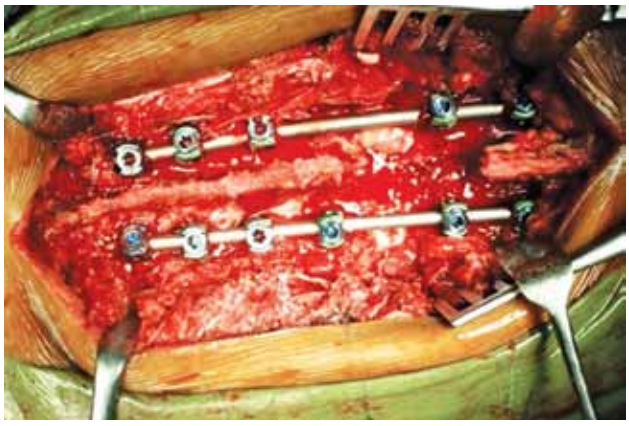

Fig. 3: Intraoperative photograph showing pus

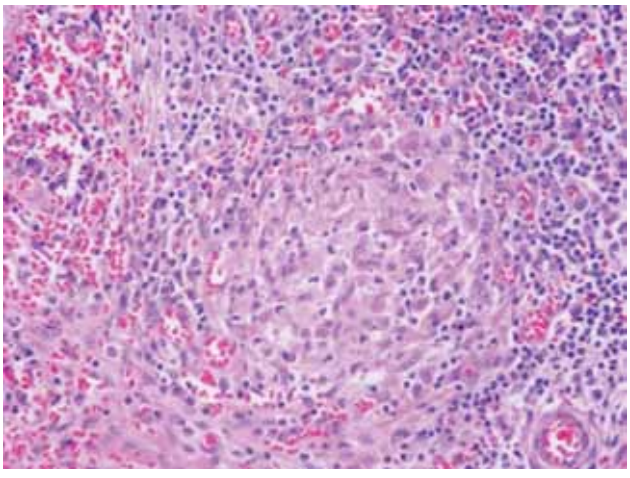

Fig. 4: Histopathological photograph showing granulomatous reaction suggesting tuberculosis

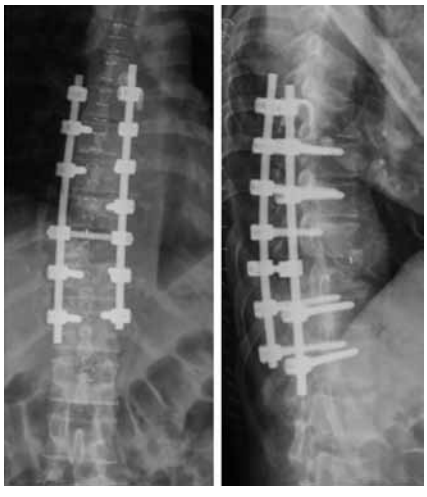

Fig. 5: Postoperative radiographs: Anteroposterior and lateral views

treatment for CML. They proposed that imatinib affects immune system and T-cell response by influencing signal transduction, thus increasing the risk for TB and advocated assessment of risk of TB before starting imatinib.[2,12] Imatinib also affects CD34+ progenitor cells consequently leading to decreased cytotoxic T-cell response.[13]

CONCLUSION

Though TB is usually the first differential diagnosis in endemic areas, it can be overemphasized and other concurrent pathologies may be missed. Such possibilities should be kept in consideration in cases with poor response or clinical deterioration on ATT. The importance of tissue diagnosis by CT-guided core biopsy as current standard of care is reiterated even in prevalent regions. Multidisciplinary approach and concurrent treatment of both the pathologies are must for optimum outcome.

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