

B-Cell lymphoma Presenting as a Solitary Bone Tumor Mimicking Ewing's Sarcoma: A Case Report

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Abstract: Primary lymphoma of bone is the malignant lymphoid infiltrate within the bone without the evidence of lymph node enlargement or other tissues. Primary bone lymphomas are rare, even though in systemic lymphomas secondary involvement of the bone marrow is common. Differential diagnoses for primary bone lymphomas include Ewing's sarcoma, chronic osteomyelitis, primary bone sarcoma, leukemic infiltrate, metastatic sarcomas, and carcinoma. Lymphomas can be misdiagnosed as Ewing's sarcoma. We report a case of 22 years old male, who had a fall from bike and presented with pain in the left hip. On examination, there was tenderness over head of femur with no obvious swelling. Laboratory investigations revealed normal blood counts with increased serum LDH and C - reactive protein (i.e. 601U/L and 60.43 mg/L, respectively). CT scan revealed lytic sclerotic lesion in head and neck of left femur and MRI showed diffuse area of altered marrow signal intensity involving left femoral head, metaphysis as well as diaphysis. Histopathological examination of biopsy from left femur were suggestive of small round cell tumor probably Ewing's sarcoma with Chronic osteomyelitis. Further, Immunohistochemical stains on paraffin- embedded tissue showed that the neoplastic cells were positive for LCA, CD20; while CD99 was equivocal. The neoplastic cells were negative for CD3, CD34 and cytokeratin. Thus, after correlating histopathological features and immunohistochemical profile, final diagnosis was given as high-grade Non- Hodgkin's lymphoma; B- cell type showing nodular pattern. Primary Bone lymphoma is a rare but distinct clinico-pathological entity. Immunohistochemistry is extremely useful in establishing a definitive diagnosis in cases of small round cell tumors, which helps in further appropriate management of the patient. Compared with single treatment, combined modality treatment can result in both a good local control rate and survival benefits.

Keywords: Ewing's Sarcoma, B-cell lymphoma, Primary bone lymphoma (PBL).

INTRODUCTION

Malignant bone lymphomas are uncommon. Malignant bone lymphomas can be divided into two main groups according to the initial extent of the disease. They are primary bone lymphoma (PBL) and secondary bone lymphoma (SBL) [1, 2].

Approximately 3% - 7% of extra nodal lymphomas present as primary bone neoplasms [3-5]. Primary bone lymphomas constitute about 3-7% of all bone malignancies & <1% of all non- Hodgkin lymphomas [6]. Primary lymphoma of the bone is an extranodal lymphoma that arises from medullary cavity and manifests as localized, solitary lesion [7]. PBL was first described by Oberling in 1928 [8]. The cause of PBL is not well known and any part of the skeleton can be involved. As PBL is a highly curable disease, it is

important for it to be differentiated from other causes of lytic bone lesions such as carcinomas and other primary bone tumors [9]. In many cases, its diagnosis is delayed because of non-specific clinical signs and equivocal radiographs [10].

The prognosis of PBL improves following chemotherapy and radiotherapy. Here, we report a case of Primary B-cell lymphoma of bone, which mimicked as Ewing's sarcoma histologically but was later confirmed after performing immunohistochemistry.

CASE REPORT

A 22- year- old male presented with pain in the left hip since four months. He had history of fall from bike four months back. He also complained of recent weight loss of 5 kg since past 1 month.

On examination, there was tenderness over head of femur with no obvious swelling. Laboratory investigations revealed normal blood counts with increased serum LDH and C - reactive protein, i.e.

601U/L and 60.43 mg/L, respectively. CT scan revealed lytic sclerotic lesion in head and neck of left femur and MRI showed diffuse area of altered marrow signal intensity involving left femoral head, metaphysis as well as diaphysis (Fig. 1).

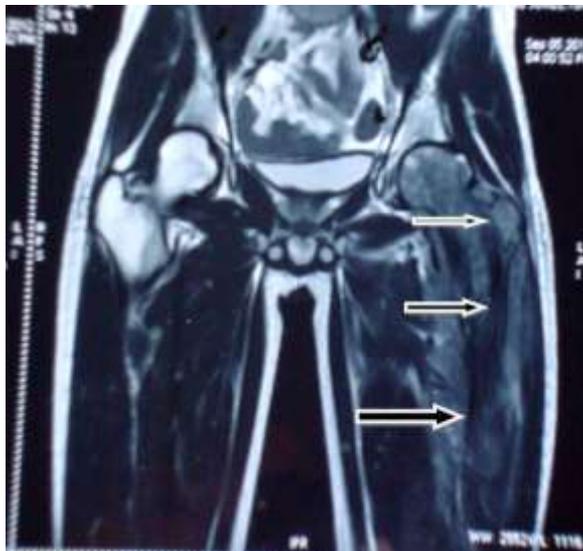


Fig. 1: MRI showing diffuse area of altered marrow signal intensity involving left femoral head, metaphysis and diaphysis (Black Arrows)

Biopsy from left femur was done and we received multiple brownish, soft to firm tissue bits. Histologically, sections revealed bony and soft tissue bits with an invasive tumor arranged in nodular pattern (Fig. 2) invading the bony trabeculae and adjacent

skeletal muscles. Nodules were composed of small to medium size round cells with scant to moderate cytoplasm and hyperchromatic round nuclei (Fig. 3). These findings were suggestive of small round cell tumor probably Ewing's sarcoma.

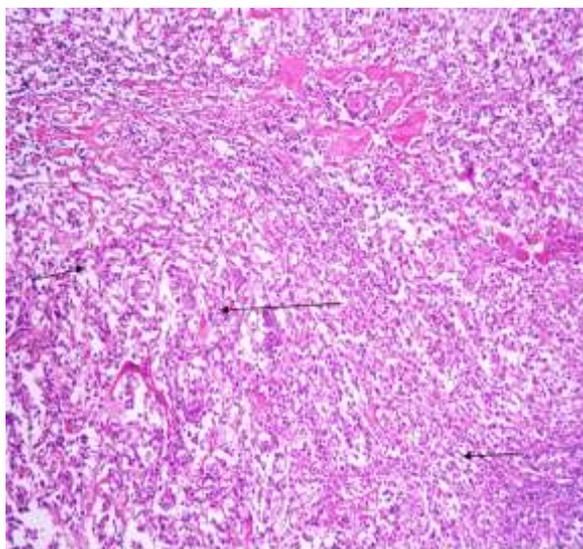


Fig. 2: Photomicrograph showing round tumor cells arranged in nodular pattern (Black Arrows) (H & E- 100x)

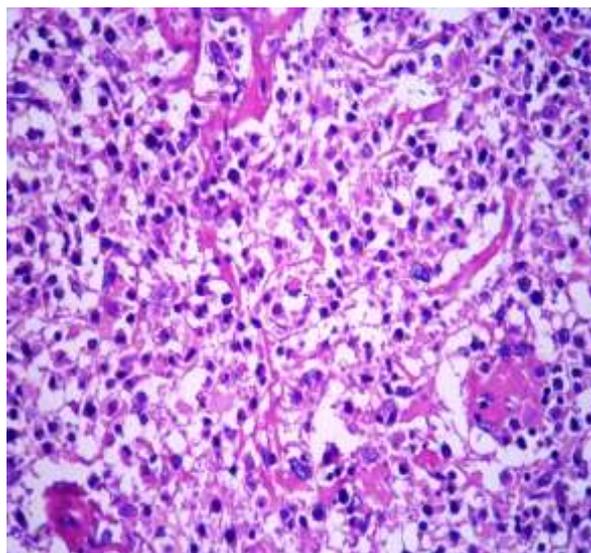


Fig. 3: Nodules were composed of small to medium size round cells with scant to moderate cytoplasm and hyperchromatic round nuclei

Further, Immunohistochemical stains on paraffin- embedded tissue sections showed that the neoplastic cells were positive for LCA (CD45), CD20;

while CD99 was equivocal. The neoplastic cells were negative for CD3, CD34 and cytokeratin (Fig. 4).

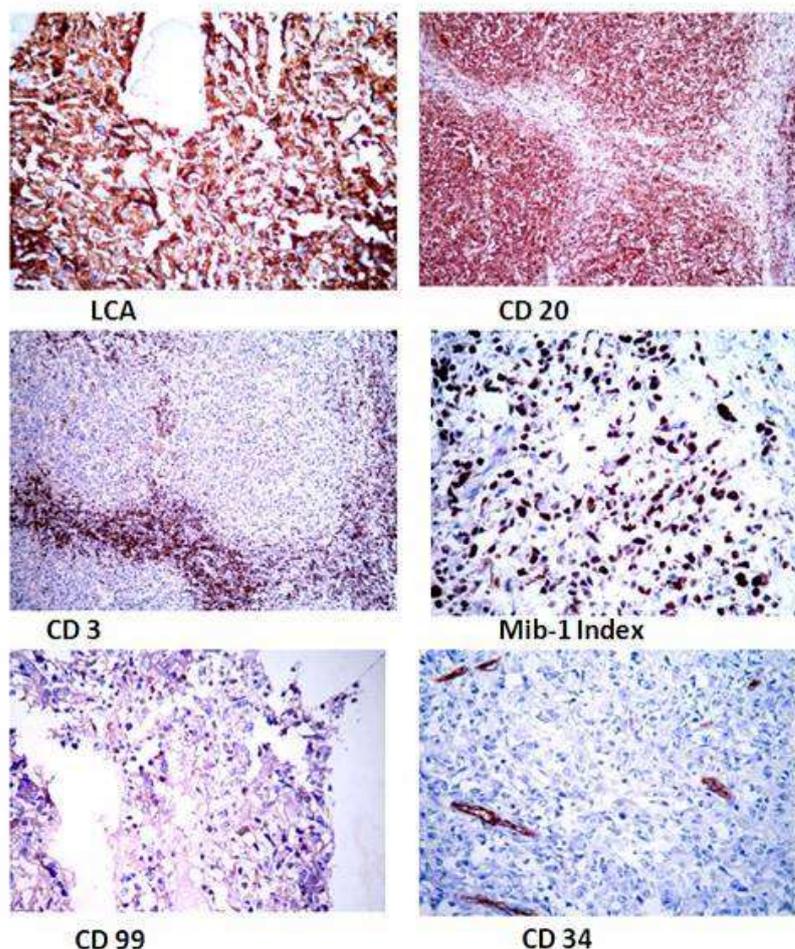


Fig. 4: Immunohistochemical Photographs: Tumors cells showing positivity for LCA, CD20. CD99 is equivocal. CD3, CD 34 negative. MIB1 proliferation index is high in nodular areas (approximately 80%)

Thus, after correlating histopathological features and immunohistochemical profile, final diagnosis was given as high-grade Non-Hodgkin's lymphoma; B-cell type.

DISCUSSION

Malignant small round cell tumors is a group of neoplasms, characterized by small, round, relatively undifferentiated cells [11]. Multiple factors can contribute to the frequent misdiagnosis of lymphoma as Ewing's sarcoma. Some of the histological features that are often present in Ewing's sarcoma may be present in lymphoma. They include overlapping nuclei, abundant geographic necrosis with perivascular tumor preservation, focal discohesiveness, an alveolar growth pattern and rosette-like structures [12, 13]. The presence of scant cytoplasm, finely dispersed chromatin and inconspicuous nucleoli in tumor cells, irregular nuclei, presence of background small lymphocytes and plasma cells among tumor cells and sclerosis often strongly suggest B-cell lymphoma [13, 14].

The cause of PBL is not well known, however, viral infection, immunodeficiency, organ transplantation, Paget's disease of the bone and genetic factors may play a role [15]. Majority of PBL patients are >45 yrs of age with slight male preponderance (M:F=1.8:1.2) [16]. Involvement of any region of the skeleton is possible; however long bones are commonly involved. The most commonly affected site is femur which accounts for ~50%. Other less common sites include pelvis, spine, ribs, mandible, scapula and proximal phalanx of thumb [13]. Common presentation of PBL include with local bone pain, soft tissue swelling, mass, pathological fracture or hypercalcemic crisis [14].

In our case, histopathological picture of the biopsy from left femur shaft revealed sheets of round cells with round, vesicular nuclei and scant cytoplasm arranged in sheets and trabecular pattern. Intervening inflammatory infiltrate composed of lymphocytes, histiocytes and plasma cells was also seen in the background. These findings were suggestive of a round cell tumor.

Furthermore, on performing immunohistochemistry on the paraffin blocks of the biopsy, the neoplastic cells were equivocal for CD99, positive for LCA & CD20, while negative for CD34, CD3 & CK(AE1/AE3) which confirmed the diagnosis of a Non-Hodgkin's lymphoma, B-cell type. The MIB-I proliferation index was high (approx. 80%) in the nodular areas & invasive fronts which showed that the tumor was of high grade.

The patient was followed up which yielded us the knowledge of him successfully undergoing six cycles of chemotherapy.

This case brings us to the fact that, such cases of round cell tumors should be thoroughly investigated & immunohistochemistry is potentially the most reliable diagnostic aid in the diagnosis of small round cell tumors.

CONCLUSION

Round cell tumors of bone and other tissues should be thoroughly investigated. Immunohistochemistry is extremely useful in establishing a definitive diagnosis in cases of small round cell tumors which helps in further appropriate management of the patient. This would enable the institution of appropriate therapeutic protocols, including neo-adjuvant chemotherapy in advanced malignancy.

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