Extremely rare case of primary nodular lymphocyte-predominant Hodgkin's lymphoma of distal femur

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DESCRIPTION

A 36-year-old man presented in the orthopaedic oncology outpatient with a history of gradually increasing pain in his right lower thigh and knee region for the past 3 months. There was no history of fever, night sweats or decreased appetite. On physical examination, some swelling and mild tenderness in his distal thigh region were noted. There was no palpable lymphadenopathy or organomegaly. Radiographs of the lower end of the femur and knee joint of the affected side were done and revealed some periosteal reaction and few abnormal-looking sclerotic and lytic areas in the distal part of the femur (figure 1A). The laboratory results, including blood count, differential, liver and renal function, were within the normal range.

Based on the age, clinical features, radiographs and routine blood work-up, a suspicion of primary bone tumour arising from the lower end of the femur was kept. A contrast-enhanced MRI scan of the right thigh from the hip to knee joint was done to further delineate the lesion, see the medullary and soft tissue extent of the lesion, and plan our biopsy. The MRI revealed an abnormal marrow

Figure 2 (A) Photomicrograph shows scattered large atypical cells admixed with many lymphocytes and a few histiocytes. The large atypical cells are uninucleate to multilobulated, and have distinct nucleoli and peripherally clumped chromatin (H&E, 400×). (B) Large atypical cells and some small lymphocytes are positive for CD20. (C) CD3 is negative in large cells. Many background lymphocytes are positive, forming rings around large cells. (D) Ki-67 is 15%.

Figure 1 (A) Radiographs of the lower end of the femur and knee joint (anteroposterior and lateral views). Periosteal reaction (blue arrow) and few lytic areas with surrounding sclerosis in the distal part of the femur (red arrow). (B(i)) T1 coronal MRI showing hypointense lesion extending from the articular surface of femur to the metadiaphyseal region. No obvious cortical breach with mild periosteal reaction; (ii) T1 turbo spin echo axial MRI showing mild joint effusion, with no involvement of the neurovascular bundle by the tumour; (iii) short tau inversion recovery coronal MRI showing hyperintensity in the lower end of femur. (C) Whole body fluorodeoxyglucose (FDG) positron emission tomography-CT showing an FDG avid intramedullary lesion in the distal epi-metadiaphysis of right femur. The cranial extent of the lesion from the articular surface of medial condyle is 18 cm. No evidence of any metabolically active lesion is noted elsewhere in the body.

signal intensity with a mild periosteal reaction involving the distal epi-metadiaphyseal region of femur with extension up to the articular surface without any skip lesions or intra-articular/extraosseous soft tissue extension (figure 1B). Possibility of a primary malignant bone tumour like osteosarcoma or lymphoma were provided as differential diagnoses. Subsequently, a core needle biopsy from the lesion was planned, keeping in view the principles of a subsequent limb salvage surgery if required depending on the final histopathology. The initial histopathology sections showed bony trabeculae between an infiltrate of scattered large atypical cells admixed with many lymphocytes and a few histiocytes. The large atypical cells were uninucleate to multilobulated. They had distinct but not very prominent nucleoli and peripherally clumped chromatin. Further immunohistochemistry confirmed the expression of CD20 in large atypical cells and in some small lymphocytes, Oct-2 positivity in majority of large atypical cells and in B lymphocytes, CD45 positivity in all lymphocytes, and large cells and CD4 positivity in T cells forming rings around large cells. CD3 was reported negative in large cells with many background lymphocytes showing positivity for CD3 and formed rings around large cells, CD30 was negative in large atypical cells, and MUM-1, CD21 and CD23 markers were all reported negative (figure 2). Taken together, these morphological and

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immunological data were consistent with a nodular lymphocyte-predominant Hodgkin's lymphoma (NLPHL), according to the WHO diagnostic criteria.¹ Staging imaging in the form of whole body (18 F)fluorodeoxyglucose positron emission tomography/CT showed no lymphadenopathy or other evidence of disease outside of the distal femoral region, thus confirming primary bone disease (figure 1C). Thus, according to the Ann Arbor staging, the patient was classified to have stage IE (single extranodal site) with bulky disease (mass >10 cm). The patient subsequently received chemotherapy before initiation of involved field radiotherapy. The lesion regressed, and the patient remains on a regular follow-up after radiotherapy with subsequent

complete resolution of the lesion and remains disease-free at 18 months of follow-up.

Primary bone lymphoma (PBL) is an extremely rare malignant entity, accounting for 2% of all primary bone tumours.² The majority of PBL are non-Hodgkin's lymphomas (HLs). The extranodal HLs are extremely rare and account for less than 1% of all HLs.³ Primary HL of the bone without any lymph node association is extremely rare and so far, only a few such cases with immunohistochemical and/or molecular confirmation have been described in the literature. Although osseous involvement could be observed in the late stages of HLs, it is extremely rare for patients to present with primary HLs of the bone and more specifically NLPHL of the bone.

Learning points

- ▶ The diagnosis of primary osseous Hodgkin's lymphoma (HL) is difficult. Histopathological and immunohistochemical analysis is a must for diagnosing nature of lymphoma.
- ▶ Whole body fluorodeoxyglucose positron emission tomography-CT enables systemic HL with secondary bone invasion to be distinguished from primary bone HL. This technique is highly specific in demonstrating the isolated bone tumour and recommended in all patients with suspected primary osseous lymphoma.
- ▶ Immediate diagnosis at the early stage of the disease and timely treatment with systemic chemotherapy and local radiotherapy are a must since primary osseous HLs without systemic manifestations have a good long-term prognosis.

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