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Primary bone non-Hodgkin lymphoma with vertebra involvement

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ABSTRACT

NHL accounts for less than 5% of all adult cancers. Bone lymphomas, mostly NHL, may cause extradural cord compression. Non-Hodgkin lymphomas (NHL) represent a group of heterogeneous neoplasms originating from the bone marrow or lymph nodes. NK cell tumours with CD56 positive immunophenotype are a very rare and heterogeneous group of diseases among bone lymphomas presenting with nonspecific clinical and radiological findings. Although there is no gold standard treatment for this disease, there are various forms of treatment such as chemotherapy, immunotherapy, surgery or radiotherapy. In this report, a primary bone lymphoma with vertebral and femur involvement, which is treated with chemotherapy, radiotherapy and autologous transplantation after surgical treatment, is presented.

Keywords
lymphoma,
natural killer cell,
non-Hodgkin,
spinal

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INTRODUCTION

Non-Hodgkin lymphomas (NHL) accounts for less than 5% of all adult cancers. Lymphoma is considered as primary bone lymphoma (PBL) when it does not involve in distant lymph nodes or non-osseous regions and affects the bones. PBL constitutes only 7% of all malignant bone tumors and is extremely rare among all lymphomas.28

NK cell tumors with CD56 positive immunophenotype are a very rare and heterogeneous group of diseases among bone lymphomas presenting with nonspecific clinical and radiological findings. Early diagnosis of the disease is important because its stage affects the prognosis. The rarity of malignant lymphomas involving the spine may complicate early diagnosis.

In this report, a primary bone lymphoma with vertebral and femur involvement, which treated with chemotherapy, radiotherapy and autologous transplantation after surgical treatment, is presented.

CASE

A 22-year-old male patient presented with low back pain, swelling in the right groin and pain in the right thigh for 1 month. On examination, there was a palpable 4x4 cm mass in the right groin and hypoesthesia on the right L3 dermatome. In the superficial tissue ultrasonography,

42 mm in diameter round lymphadenopathy was observed in the right iliac region. Contrast-enhanced lumbar MRI showed a hypo-isointense lesion on T1-weighted images (Figure 1a), and a heterogeneous hyperintense lesion on T2-weighted images (Figure 1b). Contrast-enhancing extradural lesion involved the L2 corpus and right pedicle and protruded beyond the bone (Figure 1c,1d). Lymphoma was considered in the preliminary diagnosis and excisional biopsy was performed. The biopsy was reported as a cytotoxic and aggressive T-cell lymphoma.

When preparations were completed, the patient was taken into operation.

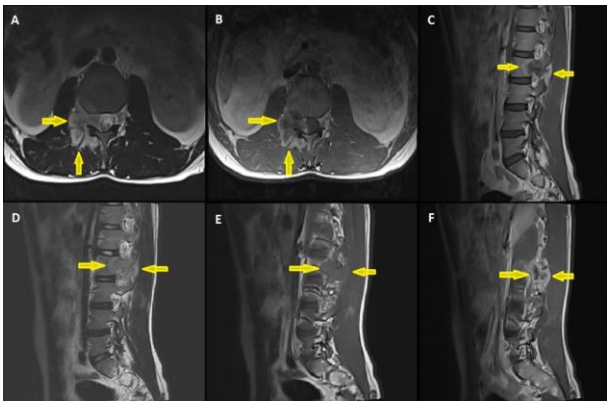

Figure 1. Lesion seen on preoperative contrast-enhanced lumbar MRI (Yellow Arrow).

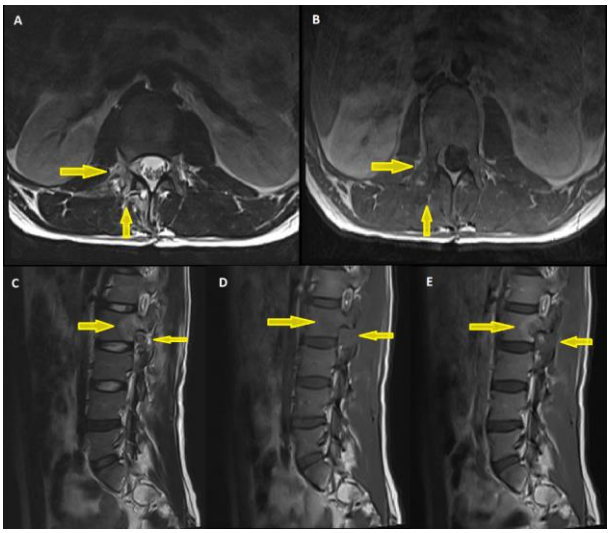

Figure 2. Sections showing that adequate decompression was achieved on postoperative contrast-enhanced lumbar MRI.

During the operation, an extradural tumoral lesion involving the L2-3 facet and extending to the transfer process was observed. A gray-colored heterogeneous mass with soft consistency surrounding the right L2 root and filling the foramen was grossly excised. Right L2, L3 roots were decompressed. In immunohistochemical examination, CD2, CD3, CD4, CD7, CD8, CD30, CD45, CD56, Granzyme B, Bcl-6, Kappa and Lambda positive, Ebstein Barr Virus, CD5, CD10, CD20, CD21, CD23, CD1A, BCL-2, HHV-8 was ALK negative. The pathological diagnosis of the patient, whose Ki-67 index was measured around 95%, was reported as high grade NHL with NK/T cells. CD56 positivity showed NK origin. In addition, T cell markers CD30 and Granzyme B expressions supported an aggressive and cytotoxic lymphoma.

Postoperative contrast-enhanced MRI showed that spinal canal decompression was achieved (figures 2A,2D) and there was a decrease in contrast-enhancing areas (figures 2B,2C,2E,2F). Patient's complaints regressed after surgery. Granulocytic cell dominance and hypercellular bone marrow with 90% cellularity were observed in pathological examination of the bone marrow. Then, chemotherapy and radiotherapy were planned for the patient by medical oncology and radiation oncology consultants. The patient received 8 cycles of CHOP (Cyclophosphamide, Adriamycin, Vincristine and Prednisolone) in a post-operative 6-month period. 15 sessions of radiotherapy were applied to the lesion on the right inguinal and femoral head. Bone marrow TRU-CUT biopsy which was performed 1 month after the completion of chemotherapy and radiotherapy was found normocellular and the patient was completely cured. In control PET CT, it was reported that the involvement of the right femoral head and lumbar vertebra regressed and the lymph nodes were non-metabolic. Stem cells were collected 1 month after complete cure and autologous transplantation was performed. A case of NK/T cell primary bone lymphoma with complete cure was discussed in the light of the literature.

Discussion

Nearly 370,000 patients are diagnosed with NHL each year, and extra-nodal NHL accounts for approximately 10-20% of all NHL[8].

In order to reduce the inconsistencies in the definition of PBL Ostrowski et al. developed guidelines. According to these guidelines lymphoma is considered as primary bone lymphoma (PBL) when

it does not involve in distant lymph nodes or non-osseous regions and affects the bones. The presence or absence of primary lymph node involvement does not affect the diagnosis[17]. Primary bone lymphoma is a rare disease 5% of all extranodal non-Hodgkin lymphomas[4]. Most of bone lymphomas are NHL[1]. The spine and pelvis are the most frequently involved regions after the femur[23]. Thoracic (69%) and lumbar (27%) spine involvements were reported most frequently among all spinal cord involvement[3]. They originate from the paravertebral lymph nodes or the vertebral body and may cause extradural cord compression(%16)[13].

The time between onset of symptoms and diagnosis is approximately eight months

Bone lymphomas occur with nonspecific radiological findings. Lytic or sclerotic image can be observed on direct X-Ray. Computed tomography (CT) is used to identify the extraosseous spread of the lesions. In magnetic resonance imaging (MRI), it is hypointense on T1-weighted images and hyperintense on T2-weighted images[24]. Gadolinium uptake is observed in contrast-enhanced examinations[14]. Positron emission tomography (PET) provides functional imaging and high FDG (Fludeoxyglucose) uptake is observed. The combined use of PET and CT scanning gives simultaneous functional and anatomical information and assists in determining response to therapy. PET - CT has been used for advanced staging in 42% of lymphoma patients[22].

Immunohistochemistry analysis is used to determine the subtype of lymphoma. Electron microscopic studies and immunohistochemical studies have shown that these tumors most commonly originate from B cells. Diffuse Large B Cell Lymphoma (DLBCL) is the most common subtype in both primary bone lymphomas and secondary bone invasions[15].

NK cell tumors are an extremely rare, heterogeneous group of diseases with a wide spectrum of morphological, immunophenotypic, and clinical features[27]. NK Cells have a CD56 positive immunophenotype. Mature and activated NK cells are negative for CD20, CD5 antigens and lack other T cell antigens such as surface CD3, CD4, CD5, CD57, CD16, CD20[18]. Tumor cells are rarely positive for the T-cell markers such as CD7, CD30, and CD45RO. Since NK cells do not contain CD3, expression of the CD3 antigen indicates that the tumor also contains T lymphocytes[9]. In this case, CD3, CD7, CD30 expression was positive and CD5 was negative.

Staging of bone lymphomas is crucial as it determines the prognosis and treatment of the disease. Recommended staging is Ann Arbor modified staging criteria[15]. Patients with Ann Arbor Stage 1 and 2 has a higher rate of positive response to treatment and less relapse rates. This information draws attention to the importance of early diagnosis.

There are many treatment options for this disease, such as chemotherapy, immunotherapy, surgery or radiotherapy. In the presence of spinal instability and progressive neurological deficit, surgical intervention is required to maintain stability and prevent neurological deterioration[11]. Adjuvant therapy should be a part of the treatment. Surgical treatment without adjuvant therapy has been shown to have no benefit in overall or progression-free survival[6]. CHOP is primarily recommended for treatment.

Radiotherapy is usually the first treatment for stage 1, 2 NK/T-cell lymphoma[29]. High-dose methotrexate-based chemotherapies are thought to have better survival than radiotherapy alone[5].

Conclusion

Treatment of spinal cord tumor should be based on diagnosis, staging, and awareness of tumor biology and behavior[2]. Post-surgical chemotherapy and autologous bone marrow treatment provide local and systemic control of lymphoma. Thus, early diagnosis can effect survival positively. In this case, surgical treatment was the primary choice because the characteristics of NK/T-cell lymphomas, tumor location, neurological status, and spinal stability were taken into account. The aggressive prognosis has led some physicians to consider bone marrow or peripheral stem cell transplantation as an alternative treatment option[12].

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