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# Primary bone lymphoma

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## Summary

Skeletal involvement in patients with non-Hodgkin's lymphoma (NHL) is not uncommon. It tends to be a late manifestation and usually occurs secondary to lymphomas in advanced stage, with high tumor burden. However, only in a few cases has skeletal involvement been attributed to a primary bone lymphoma and constitutes, therefore, the form of presentation of this disease. We describe the case of a patient with primary B-cell lymphoma of the bone that appeared with vertebral lesions and secondary spinal compression.

**Key words:** *non-Hodgkin's lymphoma B, primary bone lymphoma, spinal cord compression.*

## Introduction

Skeletal involvement in non-Hodgkin's lymphomas (NHL) is not uncommon, although when this occurs it generally presents secondary to advanced lymphomas with high tumor burden. Primary bone lymphoma (PBL) accounts for about 1-5% of malignant bone tumors and accounts for only 5% of extra-nodal lymphomas and less than 1% of lymphomas in general<sup>1-3</sup>. Lesions, which may be single or multiple, are preferentially located in long bones, especially in the femur and, more rarely, in the pelvis and vertebrae<sup>4-6</sup>.

Recently, we have studied a patient who presented vertebral lesions and spinal compression secondary to B-cell NHL. As this type of lymphoma presentation has rarely been reported in the literature<sup>5-9</sup>, we felt this merited publication.

## Clinical Case Report

A 67-year-old male smoker with a history of carotid atheromatosis, who was admitted hospital after reporting weakness in the lower limbs. Two years before, he had suffered a lacunar cerebral infarction in a left radiated crown, which progressed without clinical sequalae. For the past year, he complained of mechanical-type pain in the lower back, radiating to his right side, which increased in intensity over the last week. This condition became resistant to analgesics and made it difficult for him to sleep. Three days before being admitted to hospital, he reported weakness and paresthesias in lower limbs, as well as difficulty initiating urination. For three months, he had also reported asthenia, anorexia, and unquantified weight loss. Upon examination, we found paraparesis of proximal predominance, with hyporeflexia and hypoesthesia, with sensorial level in T8. No adenopathies or visceromegalias were palpable, with the rest of the physical examination unremarkable. Among the analytical data was a slight leukocytosis (11,900/ $\mu$ L) with 77% segmented and 11% lymphocytes. Hemoglobin and platelets were normal, as was the routine biochemical study, including levels of calcium, albumin, phosphate and LDH. No abnormalities were observed in serum electrophoretic study and tumor markers (including  $\beta$ 2-microglobulin) were normal. The study of the peripheral blood morphology was also normal.

A dorso-lumbar spine nuclear magnetic resonance (MRI) (Figure 1A) showed a loss of height of T8, which was occupied by a mass that extended to soft paravertebral tissues, especially towards the posterior vertebral and inward elements of the spinal canal, forming an epidural infiltration cuff that reached cranially until T7 and caudally until T10. All of this conditioned a segmental stenosis of the spinal canal, with deformity of the anterior contour of the medullary cord. Patches were also observed in T7 and T9, compatible with involvement of both vertebral bodies. Full-body computed tomography (CT) showed no mass or nodule suggesting malignancy or significant lymphadenopathy.

Positron emission tomography (PET/CT) showed the existence of an intense uptake suggestive of malignancy in the left T8 pedicle with destruction, as well as a slight hypermetabolism in vertebral bodies T7, T9 and T11 (Figure 1B). There were no other pathological outbreaks of uptake in other areas of the organism.

A CT-guided percutaneous biopsy of T8-dependent paravertebral mass was carried out. Its histological and immuno-histochemical study showed diffuse large B-cell lymphoma (Figure 2). No MYC, BCL2 and BCL6 rearrangements were detected. No infiltration or dysplasia data was observed in the bone marrow biopsy. The immunophenotypic study was normal.

Initially, the possibility of surgical decompression was considered, but this was ruled out after histological study. R-CHOP Chemotherapy and radiotherapy were commenced. However, the patient died after the first cycle due to septic shock attributed to *Staphylococcus Aureus*, secondary to infection of a grade III ulcer.

## Discussion

Primary bone lymphoma (PBL), defined as the presence of one or more bone lesions with no evidence of nodal or ganglionic involvement, is uncommon. According to some studies, it represents only 0.9-5% of malignant bone tumors<sup>1-3</sup>, less than 1% of lymphomas, and about 5% of lymphomas with extra-ganglionic involvement<sup>4-5</sup>. However, it should be taken into account that the definition of PBL is controversial. Most studies have included only patients with stage I and II, Ann Arbor staging system. In others, however, patients with stage IV disease (bone marrow involvement) have also been included. In addition, with improved staging procedures, especially with the combined use of computed tomography, MRI, and more recently, positron emission tomography (PET), the proportion of patients with systemic diagnosis (Stage IV, Ann Arbor staging) has increased. It usually occurs between the sixth and seventh decade of life and is more common in males than in females (3:2 ratio)<sup>3</sup>. It can manifest as a pathological fracture, especially in long bones, such as the femur. However, in cases where the spine is affected, the most frequent clinical presentation is lower back pain, which may be accompanied by neurological manifestations secondary to spinal compression, as occurred in our patient<sup>5-9</sup>. Unlike other types of lymphomas, PBL is not usually accompanied by affection of the general condition, B-symptoms, or alterations in peripheral blood. In most cases, histopathological examination demonstrates the existence of diffuse B-lymphoma of large cells<sup>5-5</sup>.

Bone lesions from lymphoma may take different patterns. The increase in density in a vertebral body ("ivory vertebra") is probably the most characteristic blast lesion, although it is also possible to see more or less diffuse osteo-sclerotic areas, which are sometimes associated with osteolytic phenomena<sup>10</sup>. However, destructive images that

Figure 1. MRI dorsum-lumbar column showing a T8-dependent right paravertebral mass extending from T7 to T10 (A). PET/CT scan showing the presence of a hyper-captive lesion in the left pedicle of T7, with slight hyper-metabolism in T8, T10 and T12 vertebral bodies and absence of pathological uptake to other levels (B)

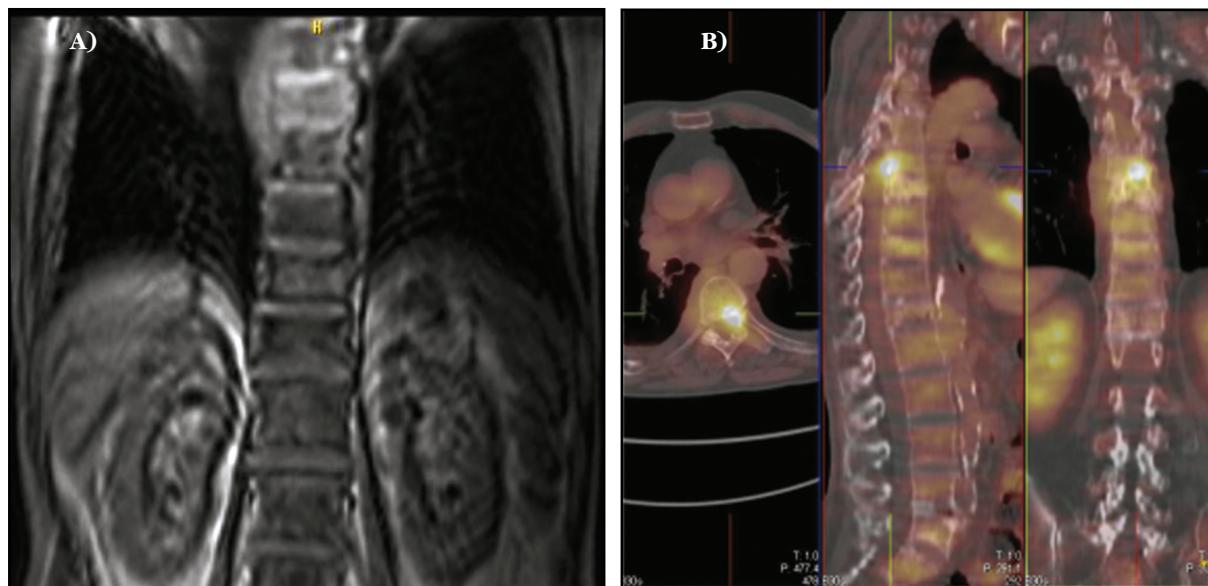
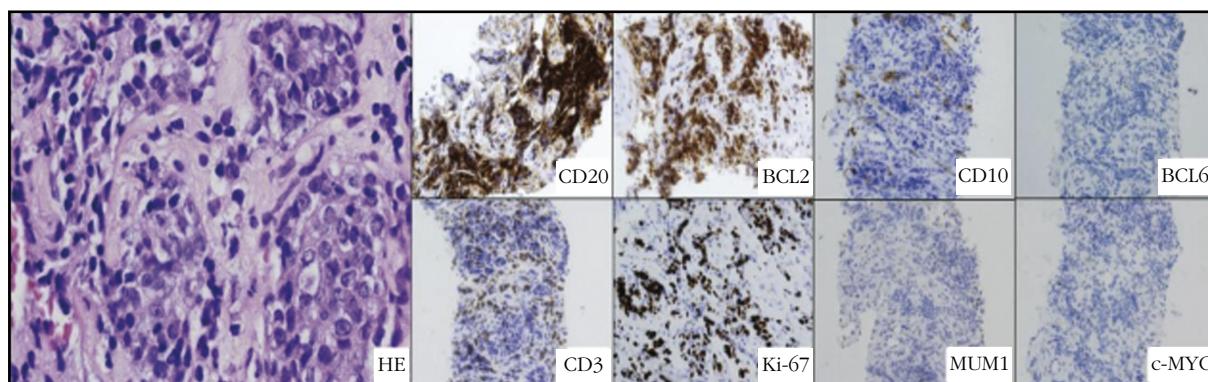


Figure 2. HE paravertebral mass (40x) in which a large-cell monomorphic, centroblastic-type lymphocyte with isolated eosinophilic nucleoli and nuclear indentations (B-lymphoma) is observed. Immuno-histochemical study (40x) in which CD20 and BCL2 were observed, with negativity for CD3, CD10, BCL6, MUM1 and c-MYC. The proliferative index (ki-67) was 60%



may be multifocal or isolated are more frequent. They predominate in the pelvis, the vertebrae and the long bones, arriving in these cases to break the cortex, infiltrating the adjacent soft tissues<sup>11</sup>.

Treatment of PBLs is based on immuno-chemotherapy and radiotherapy, with surgery limited to obtaining samples for diagnosis and stabilization and fixation of possible fractures<sup>12,13</sup>.

When there is vertebral and spinal involvement, as in our patient, surgical resection may be necessary, especially when the diagnosis is uncertain, but if preoperative biopsy confirms the presence of NHL, radiotherapy and/or chemotherapy alone can solve spinal compression and surgical intervention is not necessary<sup>5,8,14-16</sup>.

The therapeutic response and prognosis are usually better in PBL than in lymphomas with secondary bone involvement, especially in the young,

with little extensive lesions. This reinforces the importance of early diagnosis of these tumors<sup>17,18</sup>.

**Conflict of interest:** The authors declare no conflicts of interest.

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