

EPITHELIOID HEMANGIOENDOTHELIOMA PRESENTING AS A VERTEBRAL FRACTURE

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Abstract

Epithelioid hemangioendothelioma (EH) is a rare vascular tumor with an intermediate biological behavior between hemangioma and angiosarcoma. Vertebral location is even more rare, and because the number of reported cases of EH is small and the follow-up periods short, the best surgical treatment, the role of radiotherapy and chemotherapy, as well as the definitive prognosis are still not established.

The authors report a case of EH which presented as a vertebral fracture with neurological impairment, where a percutaneous biopsy was inconclusive. Treatment included vertebrectomy, with complete excision of the lesion, spinal canal decompression and vertebral stabilization. Anatomopathological study revealed an epithelioid vascular neoplasm with low mitotic index, and tumor cells reactive to vimentin, CD31 and CD34, leading to the diagnosis of Grade I Epithelioid Hemangioendothelioma. Because of the wide resection achieved and the low aggressiveness of the lesion, no adjuvant radio or chemotherapy was undertaken, and at 6 years follow-up there are no signs of recurrence or metastasis.

Keywords: Epithelioid Hemangioendothelioma; Vertebral Tumor.

Introduction

Epithelioid hemangioendothelioma (EH) is a rare vascular soft tissue tumor of intermediate malignancy¹. Although initially described as most common in the soft tissues of the extremities, other locations are pos-

sible, namely bone. Reported cases of spinal involvement are extremely rare and follow-up periods have been too short, so the best management and prognosis for these lesions is still not clear.

Case Report

MMDE, female, 51 years old, presented with a 2 months history of low back pain and progressive paraplegia. There was no trauma history or relevant general symptoms. Imaging studies, including X-Rays, CT-Scan and MRI (Figures 1, 2, 3), revealed a L1 pathological fracture with vertebral collapse and significant spinal compression. A percutaneous biopsy was performed but was inconclusive. Primary occult neoplasm studies were negative and inflammatory markers were only marginally increased (ESR: 20 mm, CRP: 0,7).

Due to the neurologic deterioration a staged surgical treatment was decided aiming at spinal canal decompression and vertebral stabilization. Through an anterior approach a L1 corpectomy was done, with placement of a vertebral spacer (Synex, Synthes Spine) and lateral plate fixation (Z-plate, Medtronic). Two weeks later T10-L4 pedicle instrumentation and fusion was performed (CD Horizon, Medtronic) (Figure 4).

Histological study of the lesion revealed a mesenchymal tumor with vessels formation composed by epithelioid cells forming cords or in solid areas, surrounded by a condroid-like stroma. Mitotic index was low and no necrosis was observed. Immunohistochemical study revealed that the tumor cells were reactive to vimentin, CD31 and CD34, leading to the diagnosis of Epithelioid Hemangioendothelioma (Figure 5).

In face of the extensive resection and the nature of the lesion it was decided not to proceed with other treatments such as radiotherapy or chemotherapy.

The patient remained asymptomatic for 5 years af-

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Figure 1. X-Rays showing a L1 burst fracture with nearly complete vertebral collapse

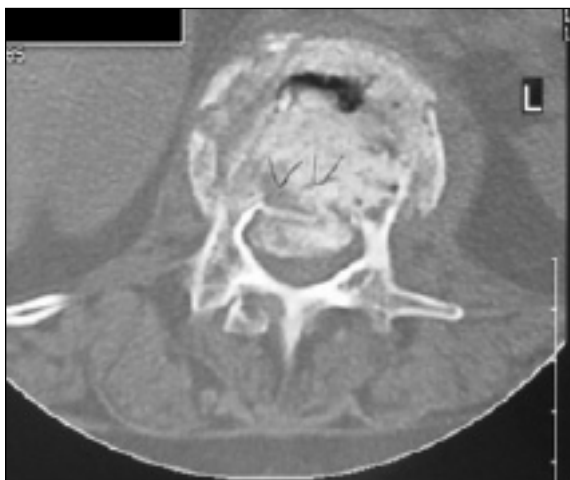


Figure 2. CT-scan revealed significant compromise of canal diameter

ter surgery, when she consulted again for progressive anterior imbalance. Radiographic study showed junctional kyphosis above the fused segment. It was decided to perform multiple Smith-Peterson osteotomies and extend the instrumentation to T4 to correct the deformity. The evolution was positive, and an asymptomatic balanced spine was achieved.

At present, more than 6 years after surgery, there is no evidence of recurrence or metastasis (Figure 6).

Discussion

Vascular tumors account for less than 1% of all bone tumors². Malignant primary vascular tumors



Figure 3. MRI: both on T1 and T2 weighted sequences severe neural compromise is observed; the lesion is confined to L1, which is significantly collapsed, with no adjacent reaction



Figure 4. Post op of staged double approach vertebrectomy, with complete excision of the lesion, spinal canal decompression and vertebral stabilization

of bone are even more rare and include angiosarcoma and hemangioendothelioma. EH was first described by Weiss and Enzinger in 1982 as a rare vascular lesion with an epithelioid appearance¹.

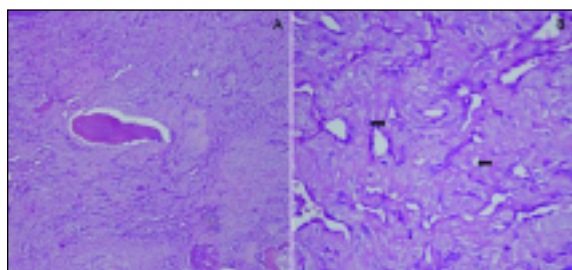


Figure 5. Histological aspect of epithelioid hemangioendelioma involving bone (A – HE, 100x), consisting of cells with intracytoplasmic vascular lumina (arrows), or delimiting vascular spaces (B – HE, 200x)

The tumor is composed of a discrete population of epithelioid endothelial cells arranged to resemble primitive capillaries with an intermediate biological behavior between hemangioma and angiosarcoma^{1,3,4}. EH represents 1% of all vascular neoplasms and is locally aggressive. Although initially described as being most common in the soft tissues of the extremities, other reported sites of occurrence include the liver, lung, breast, meninges, brain and long bones⁵⁻⁸.

Osseous EH is an extremely rare lesion. Commonly affected bones include tibia (25%), femur (20%), metatarsals (15%), fibula (10%) and humerus (10%). Vertebrae represent only 10% of all reported cases^{3,9}. Multiple lesions may be present either in the same bone (particularly the tibia and fibula), in adjacent bones in the same limb, in widely separated bones, or in nearby or distant soft tissues^{3,9}.

There seems to be no gender predilection, although some authors consider it to be more frequent in males^{3,9}. The highest incidence occurs in the third and fourth decades^{10,11}. Recently a rare association with neurofibromatosis type I has been reported¹².

Clinically, osseous EH presents with pain and swelling, especially if the affected bone is superficial, or as an enlarging mass (most are smaller than 5 cm.), and pathological fractures can occur in nearly 10% of the patients^{3,9}. If the spine is involved, the lesion may cause radicular symptoms or paraplegia, as in the present case, indicating urgent intervention^{9,13}.

Radiographically, EH appears as an expansive, osteolytic lesion well demarcated if small (1-2 cm) or poorly demarcated if large^{3,9,11}. It has a distinctive soap-bubble matrix with a sclerotic margin like that found in benign vascular tumors, with no pe-

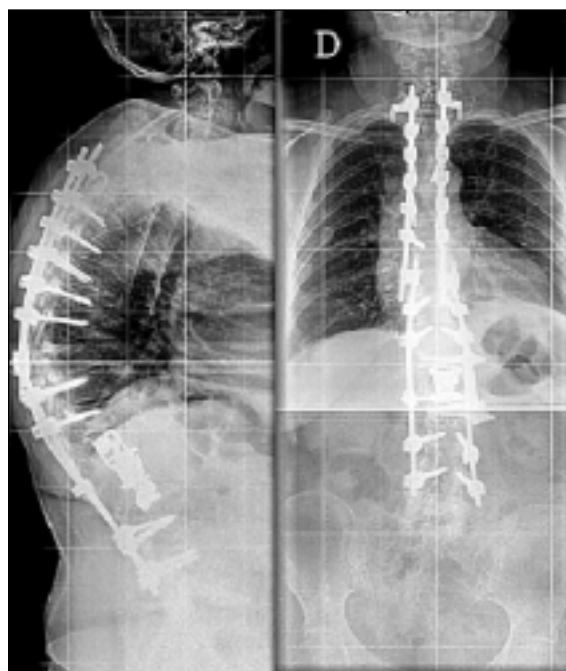


Figure 6. At 6 years follow-up, after surgical correction of anterior imbalance, there is no evidence of recurrence or metastasis

riosteal reaction. Lesions with ill-defined margins and loss of trabeculae are considered more aggressive⁹. Radiographic findings may be nonspecific and differential diagnosis should include osteomyelitis, aneurismal bone cyst, giant cell tumor, osteolytic sarcomas, lymphomas and metastasis³.

On CT-scan these lesions enhance with contrast media, and though nondiagnostic, it may outline the extent of bone destruction and help distinguish EH from hemangioma, which has a characteristic CT appearance⁹.

MRI findings are nonspecific. In T1-weighted contrast sequences, bone tumors of vascular origin show higher intensities than skeletal muscles but lower intensities than fat; in pulse sequences emphasizing a T2 contrast, signal intensities of vascular bone tumors are considerably higher than intensities of muscle and fat^{3,9}.

On gross pathology examination EH present as reddish-brown lobulated masses, well demarcated with irregular scalloped borders and a bright red hemorrhagic appearance. Microscopically, the tumor is characterized by anastomosing cords, solid nests, or short strands of round to slightly spindled eosinophilic neoplastic endothelial cells embedded in a chondroid-like or hyalinized stroma^{9,14},

as can be observed in the present case. Rarely large and distinct vascular channels are identified in the center of the tumor, as contrasted with the periphery of the lesion, and mitotic activity seldom is identified in these tumors¹³. In some instances osteoclastic giant cells can be observed, and in others these tumors show atypical histological features such as marked nuclear atypia, higher mitotic activity, spindling of the neoplastic cells and necrosis, which are associated with a more aggressive course^{9,15}.

Immunohistochemical analysis reveals that the tumor cells are positive for vimentin and endothelial markers such as factor VIII-related antigen, ulex europaeus lectin, CD31 and CD34⁹. Histological differential diagnosis mainly includes metastatic carcinoma in bone in which immunohistochemical demonstration of keratin and epithelial membrane antigen identifies the adenocarcinoma cells in the absence of reactivity for endothelial markers⁹.

Campanacci *et al.* classified EH in 3 grades of malignancy, based on the morphology and differentiation of angioblasts, being treatment and prognosis grade-dependent¹⁶. According to these criteria the present case could be classified as Grade I EH.

Treatment can vary from simple curettage for grade I lesions to vertebrectomy with preoperative embolization for grade III tumors^{9,16}. *En bloc* resection, following oncologic surgical principles, significantly improves results and should be attempted whenever possible¹⁷. Radiation seems beneficial and safe for treating surgically inaccessible tumors, and has also been proposed as adjuvant therapy after surgical excision^{9,17}. Although there may be a place for chemotherapy in the management of EH, precise indications and regimens have not yet been established^{3,13}.

The prognosis is often favorable, particularly for low-grade lesions where complete excision is performed. However local recurrence or even metastasis are possible^{13,18,19}. In the present case, because of the wide resection achieved and the low aggressiveness of the lesion no adjuvant therapy was decided, and 6 years after there are no signs of recurrence or metastasis.

Nevertheless, since the number of reported cases of EH is small and the follow-up periods short, the best surgical treatment, the role of radiotherapy and chemotherapy, as well as the definitive prognosis are still not established.

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