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A Rare Case of Osteoblastoma of the Sacrum

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Abstract

Osteoblastoma (OB) is a rare bone tumor. It is classified as benign and represents about 1% of all bone neoplasms. While it typically occurs in the axial skeleton, sacral involvement is extremely rare. Despite its non-malignant nature, OB can be locally aggressive and may lead to considerable morbidity if not addressed in a timely manner. This report discusses a unique case of sacral, focusing on the clinical, radiological, and surgical features.

A 14-year-old male patient reported experiencing increasing pain in his left lower limb and lumbosacral region for two years. A magnetic resonance imaging (MRI) of the lumbosacral area identified a mass measuring 50x43 mm on the left side of the sacrum in T2-weighted images. Further evaluation with a positron emission tomography/computerized tomography (PET/CT) scan indicated a destructive bone lesion in the left sacrum, measuring 43x40 mm, with a soft tissue component and increased fluorodeoxyglucose (FDG) uptake (standardized uptake value maximum: 11). The patient underwent surgical excision by a neurosurgery team, and histopathological analysis confirmed the diagnosis of OB.

Although OB is a benign tumor, its location can cause significant symptoms, particularly in rare areas like the sacrum. Diagnostic imaging modalities such as MRI and PET/CT are crucial for identifying the tumor and planning surgical intervention. The elevated FDG uptake observed on PET/CT indicated a metabolically active lesion, reinforcing the need for surgical treatment.

Sacral OB is an exceptionally rare entity. This case underscores the need to include OB in the differential diagnosis of sacral lesions and illustrates the value of imaging in facilitating accurate diagnosis and management. Surgical resection remains the cornerstone of treatment, offering good clinical outcomes.

Keywords: Osteoblastoma, sacrum, primary bone tumor, case report

Introduction

Osteoblastoma (OB) is an uncommon, non-cancerous bone tumor. It represents roughly 1% of all bone tumors.[1] Of these, 40% are found in the axial skeleton. OBs are very rare in the sacrum.[2,3] OBs are reported to occur in children aged 10-15 years.[4] OB is more common in males. It often arises in the spine.[5] Clinically, it presents with pain, swelling, warmth, and tenderness. In OB, the pain typically does not improve with nonsteroidal anti-inflammatory drugs (NSAIDs). Some OBs may present with paresthesias and paraparesis.[6] The standard treatment for OBs is total

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surgical excision. Thermoablation and high-intensity focused ultrasound can be used, especially for small lesions.[7] We present an unusual case of OB located in the sacrum.

Case Report

A 14-year-old male patient reported experiencing increasing pain in his left lower limb and lumbosacral region for two years. The patient stated that these symptoms appeared 2 years ago and intensified in the 4 months before the admission. In the lumbosacral magnetic resonance imaging (MRI) of the patient, a mass lesion was detected in the sacrum on the T2 sequence with the size of 50x43 mm measured in the coronal sections on the left. In positron emission tomography/computed tomography (CT), a destructive bone lesion with soft tissue component, measuring 43x40 mm, was detected in the axial plane, showing increased fluorodeoxyglucose metabolism (standardized uptake value maximum:11) in the left sacrum (**Figure 1**). He was operated by neurosurgery. Histopathology was reported as OB. In the lumbosacral MRI taken after the operation, no residual mass lesion was observed in the operation area. Informed consent was obtained from the patient's parents.

Pathological Findings

OB, benign osteoblastic lesion was detected. The special AT-rich sequence-binding protein 2 was positive.

Treatment

The primary treatment for patients with OB is surgery.[8] Currently, the preferred treatments for these lesions include percutaneous thermoablation techniques, with radiofrequency ablation under CT guidance being considered the gold standard.[9-11]

Discussion

OBs are uncommon tumors, making up less than 1% of all bone neoplasms. They predominantly affect males, with an approximate male-to-female ratio of 2.5:1.[12,13] OBs are typically diagnosed during adolescence,[14] and our patient's diagnosis at the age of 14 falls within this expected range. While 30-40% of OB cases involve the spine, the cervical region is the most frequent site, with the lumbar spine and sacrum being less frequently affected.[15] In our case, the OB was detected in the sacrum.

Histologically, OB is composed of highly vascularized connective tissue and immature bone.[16] Although it is a benign, slow-growing tumor, sacral OBs can be particularly challenging due to their location. It typically presents with pain. It often does not respond to NSAIDs.[17] OBs generally measure between 3 to 4 cm; however, those located in the sacrum tend to be larger,[18] as seen in our patient, whose tumor measured approximately 5 cm.

The preferred treatment approach is complete surgical excision, as this provides the highest likelihood of a cure and lowers the risk of recurrence.[19] Our patient underwent successful surgical removal of the tumor. Recurrence rates can reach up to 25%, and some patients may experience multiple local recurrences. The use of adjuvant chemotherapy or radiotherapy in OB treatment remains unclear, with no consensus on its effectiveness.[20]

Conclusion

Sacral OBs are rare and can be challenging to diagnose. However, with modern imaging and treatment techniques, precise surgical planning has become feasible even for difficult locations such as the sacrum.

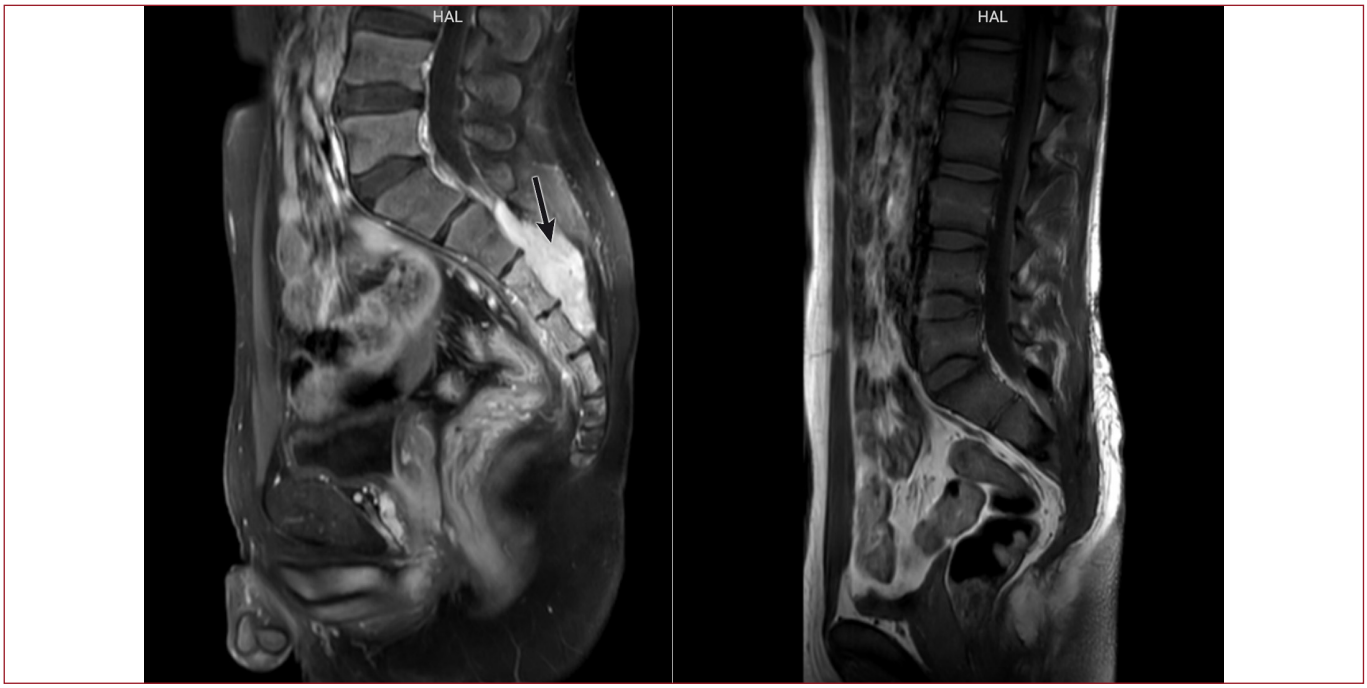

Figure 1. Preoperative and postoperative MRI images for osteoblastoma
MRI: Magnetic resonance imaging

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