

# Case of Cervicothoracic Spine Osteoblastoma in a 5 Year-old Boy

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## Abstract

Osteoblastoma is a benign primary bone tumor which represents 3% of all benign tumors and 1% of all bone tumors. It is localized commonly in the spine. We report the case of a 5 year-old boy with cervicothoracic spine osteoblastoma. The incidence of osteoblastoma is between the second and third decade; our case was seen in the first decade. The evaluation by computed tomography scan and magnetic resonance imaging show the lesion of posterior elements of D1 vertebrae with extension to 4 upper and underlying vertebrae. The decision of excision was taken a long time of discussion because for surgical team, the lesion was mimicking malignancy of the spine. The child had an uneventful postoperative recovery and the pain resolved after surgery. The objective of this article was to report a case of extensive osteoblastoma and to alert the clinician to avoid delay management due to differential diagnosis.

**Keywords:** Osteoblastoma; Pediatric population; MRI; Surgical treatment..

## Introduction

Osteoblastoma is a benign primary bone tumor which represents 3% of all benign tumors and 1% of all bone tumors. Different bone localizations are described, but most often it concerns the vertebral column (32-45%) with a predilection of the posterior part. Osteoblastoma predominates in the second decade with a male to female sex ratio of 2/1 [1]. The peculiarity of this benign tumor is the differential diagnosis with several benign or malignant diseases which leads to a delay in diagnosis and treatment [2]. We report the case of a 5 year-old boy with a delay diagnosis and treatment, managed surgically with a good follow-up.

## Case Report

A 5 year-old boy was referred to our hospital by his general practitioner for low back and postero-cervical mass. The initial history goes back to 1 year by back pain without particular irradiation. These pains are especially when standing and walking and become persistent. On clinical examination, thoracic gibbosity is discovered with tenderness on palpation. There was no motor or sensory deficit on the neurological examination.

The evaluation by magnetic resonance imaging (MRI) of the whole-spine show an infiltrating tumor process centred on D1 vertebra, osteolytic, more marked at the level of the pedicle and the posterior arch. Described in iso signal T1 and hypersignal T2 and hypersignal STIR, strongly enhanced after gadolinium injection. It extends into the

epidural at the level of the 4 upper and underlying vertebrae and compressing the spinal cord (Fig 1). In the CT scan, we noted an expansive osteolytic lesion involving the vertebral body of D1 vertebra, pedicle, and transverse process with extension to 4 upper and underlying vertebrae. The Calcifications were well defined in the CT scan.

The child underwent a surgical biopsy on the basis of the imaging results. On histological examination, we note a tumor proliferation made up of epitheloid cells with a large nucleolus nucleus and an eosinophilic cytoplasm mixed with giant osteoclastic-like cells. Haemorrhagic suffusions dissociate this tumor proliferation in places. Focally, we note the presence of immature osteoid bordered by above-described cells. An immunohistochemical study was performed, tumor cells express vimentin and they do not express cytokeratin, CD86, synaptophysin, chlorogranin, myogenin, desmin, Ps100, CD1a, CDS, EMA, CD15 or CD30. This histological aspect is compatible with an osteoblastoma in its epitheloid variant. The decision of a surgical excision was taken by our team but the infantile surgery team hesitated to perform the surgery because it would be a malignant tumor given its aggressive character. After histological re-reading by another laboratory, the histopathological features confirm an osteoblastoma. We returned this time to the neurosurgery team for adults who have agreed to perform surgical excision. The child had an uneventful postoperative recovery and the pain resolved after surgery. Postoperative CT scan noted vertebral collapse exceeding 60% of the D1 vertebrae producing a

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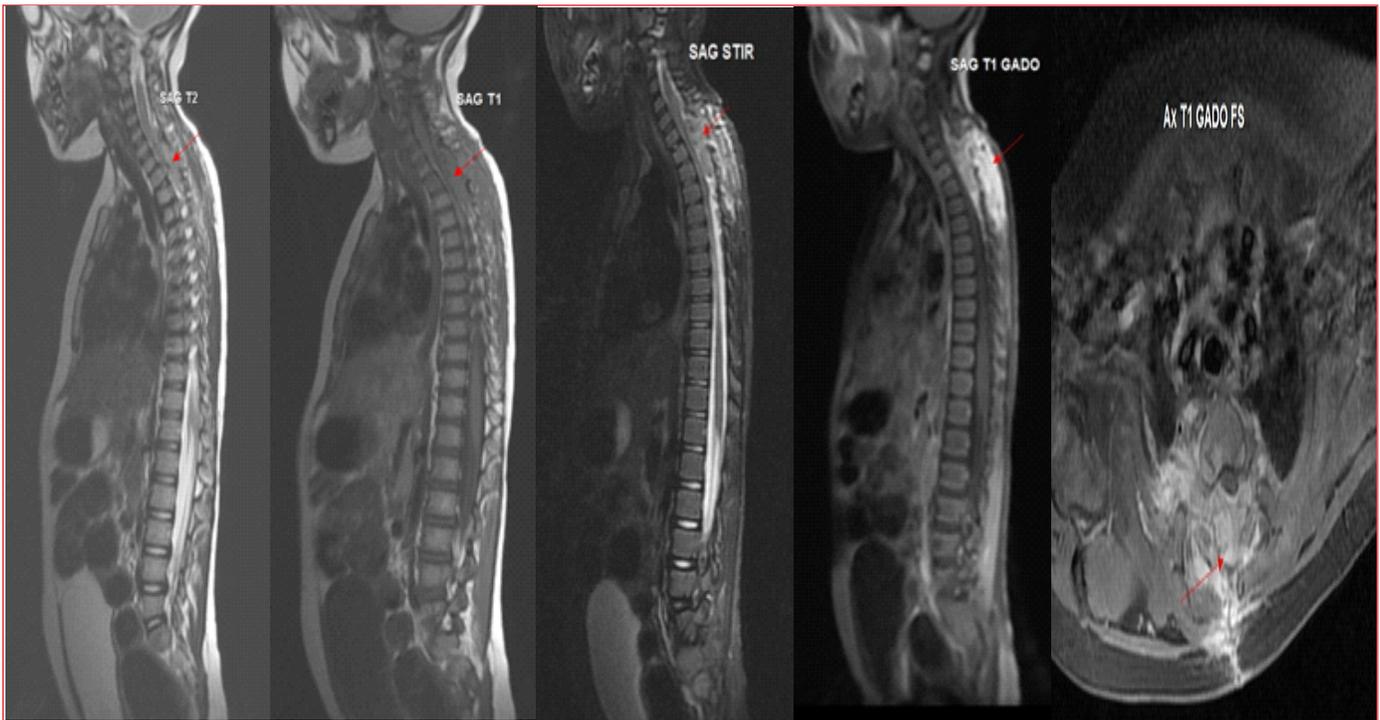
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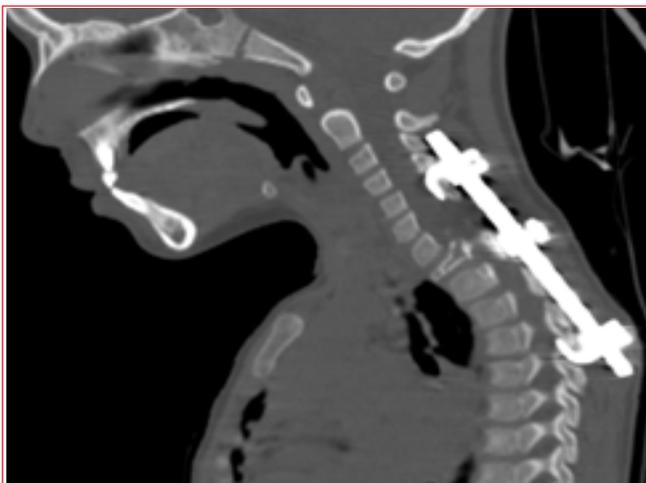


**Figure 1:** An infiltrating tumor process centred on D1 vertebra, osteolytic, more marked at the level of the pedicle and the posterior arch. It extends into the epidural at the level of the 4 upper and underlying vertebrae and compressing the spinal cord.

severe fracture without suspect enhancement at this level with visualization of an osteosynthesis material from C3 to T1 (Fig 2).

### Discussion

In pediatric oncology, osteoblastoma is an exceptional benign tumor [3], it is 20 times less frequent than osteosarcoma which is well known [4-5]. It accounts for only 1% of primary bone tumors and 3% of benign bone tumors [1]. In this pediatric population, spinal tumors are rare, and osteoblastoma is one of the causes among other etiologies. [6] Osteoblastoma is an entity individualized by Jaffe [7] et Lichtenstein [8] as a benign bone tumor of osteoblastic origin characterized by the proliferation of osteoblasts and the presence of osteoid bone trabeculae within a loose fibrovascular stroma. It is common in the second or third decades, with a marked male predominance. Osteoblastoma is localized especially in the spine in 32 to 45% of cases, especially the



**Figure 5:** Postoperative CT scan noted vertebral collapse exceeding 60% of the D1 vertebrae

lumbar spine with a strong predilection for the posterior elements, the long bones are the second location with 20% [1]. In our case it concerns thoracic and cervical spine.

Clinically, pain is the main symptom, with variable intensity, exaggerated with mobilization and when walking [3-4, 9]. the pain is initially intermittent and then continues with nocturnal paroxysms and usually relieved by salicylic acid. Neurological symptoms (tingling, neurological deficits, etc.) are seen in case of spinal cord compression. Scoliosis and torticollis are other possible symptoms. Our case presented the pain with no neurological signs.

A good quality standard x-ray can detect Osteoblastoma of the spine. In typical form it shows a small lytic area within a condensing cortical reaction. Its outlines are not always clear, sometimes marked by reactive osteosclerosis [10]. CT scan contributes highly to diagnosis and provides a detailed analysis of bone lesions and extraosseous tumor expansions and remains the basic examination in the diagnosis of osteoblastoma, but the MRI is the exam of choice in Osteoblastoma of the spine, especially identification of the bone lesion, its localization, and its impact on nervous structures [11]

In histological point of view, osteoblastoma appears in microscopy as a compact reddish tissue friable and granular and appears in microscopy as epithelioid osteoblasts producing woven bone in its aggressive form, it is more immature and present prominent nucleoli, larger trabeculae, and invasion of cortical bone [12].

The most described and effective treatment for osteoblastoma is surgical treatment [13]. Resection should be complete if possible to avoid recurrence, but some locations resection may not be complete [5]. However, some authors have noted better outcomes with subtotal resection [1]. Radiotherapy remains a controversial option, especially for subtotal resections, but remains the most common adjuvant therapeutic modality [14]. For our case, no adjuvant therapy was needed because the child had a radical excision.

## Conclusion

Osteoblastoma is a benign tumor, but it can be aggressive. It presents a problem of differential diagnosis with other benign and malignant tumors. In its spinal location, CT is a major diagnostic aid, but MRI is

the examination of choice in identifying the bone lesion, its site and its impact on nerve structures. Complete and careful surgical resection is the most effective treatment.

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