

## Osteoblastoma in dorsal spine: a case report

### *Osteoblastoma em coluna dorsal: relato de caso*

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**ABSTRACT:** The osteoblastoma is a benign primary tumor of the bone that is comprehended 1% of these kinds of tumors. It affects young individuals, mainly in the vertebral column, where it produces varied symptomatology, from pain to structured deformities, where the duration of symptoms until the definitive diagnosis is prolonged. The treatment is eminently surgical. It predominates in young males, about 3:1. This report describes a case of an expansive vertebral lesion in the T6 vertebra, with delimited margins, causing discrete expansion of the bone in a 24-year-old male patient. The magnetic resonance imaging of the spine revealed the presence of a tumor larger than a lime orange at the T6 vertebra. Many bone-producing lesions have clinical features, especially neurological and radiological. It concludes that it is extremely important to understand all these findings, since it helps in the proper diagnosis to lead to the treatment of this rare injury, leading to a good prognosis.

**Keywords:** Osteoblastoma; Dorsal spine; Tumor; Male; T6 vertebra.

**RESUMO:** O osteoblastoma é tumor benigno primário do osso e corresponde a 1% destes tumores. Acomete indivíduos jovens, principalmente na coluna vertebral, onde produz sintomatologia variada, desde dor até deformidades estruturadas, onde a duração dos sintomas até o diagnóstico definitivo é prolongada. O tratamento é eminentemente cirúrgico. Predomina nos jovens do sexo masculino, cerca de 3:1. Este relato descreve um caso de uma lesão vertebral expansiva na vértebra T6, com margens delimitadas, causando expansão discreta do osso em um paciente do sexo masculino de 24 anos de idade. A ressonância magnética da coluna vertebral revelou presença de um tumor com tamanho maior que uma laranja lima a nível de vértebra T6. Muitas lesões produtoras de osso possuem características clínicas, especialmente neurológicas e radiológicas. Conclui-se que compreender todos esses achados é de extrema importância, uma vez que auxilia no diagnóstico adequado para levar ao tratamento deste raro dano, levando a um bom prognóstico.

**Palavras-chave:** Osteoblastoma; Coluna dorsal; Tumor; Sexo masculino; Vértebra T6.

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## INTRODUCTION

Osteblastomas are benign neoplasms that arise from osteoblasts. They are uncommon lesions, accounting for less than 1% of bone tumors<sup>1,2,3,4,5</sup>. The most frequently affected bones are the spine, sacrum, calvaria, the longer bones, and small bones of the hands and feet. Osteblastoma has a rapid clinical progression and is characterized by pain and swelling at the lesion site. The use of salicylates is associated with relief of painful symptoms. The lesions vary from 2 to 4 cm, but large lesions with about 10 cm can also be found<sup>2,3,4,6</sup>.

A primary tumor in the spine is rare. An early diagnosis of this lesion is usually difficult, as pain, functional limitation and deformity are common complaints in other spinal disorders. This tumor is more frequent in males (3:1) and is usually located in the posterior arch of the vertebrae<sup>7</sup>.

From a histological point of view, osteblastomas have a large number of osteoblasts, in a highly vascularized tissue, interspersed with bone trabeculae with osteoid<sup>7</sup>. The treatment of osteblastoma is mainly complete excision of the lesion or curettage. Osteblastoma may be a reactive process, as there are reports of regression after biopsy or incomplete removal. The prognosis is good and recurrence and malignancy is rare<sup>2,4,5</sup>. This study aims to report the clinical case of a benign osteblastoma in the T6 vertebra leading to motor impairment of the patient, with significant size, rapid growth and surgical treatment.

## METHOD

A 24-year-old male patient had an osteblastoma and presented a reduction in malignant cells after a surgical procedure.

## CASE REPORT

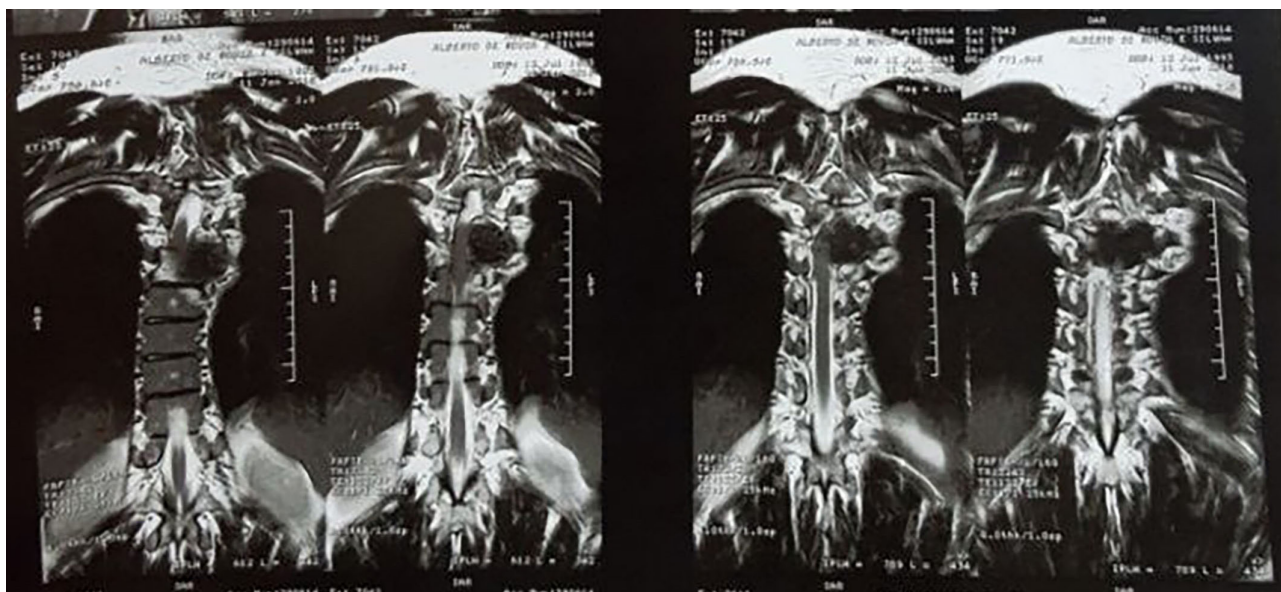
A man has been complaining of spinal pain for 2 years and visiting the hospital in moments of acute pain. Simple radiographic examinations did not show any changes. The patient reported using analgesics and muscle relaxants to relieve pain. One day, he woke up with paresthesia on his left hallux and a “lump on his back” that grew rapidly every day, reaching the entire left lower limb and the right foot. He then went to an orthopedist who requested a sagittal view of the magnetic resonance imaging of the thoracic spine. The exam showed a tumor of approximately 6 cm in diameter in the T6 vertebra (Figures 1 and 2).

The day after the consultation, January 16, 2018, the patient was admitted to the State Emergency Hospital of the Northwest Region of Goiânia Governador Otávio Lage de Siqueira (HUGOL). During a 15-day waiting period, the patient was administered intravenous tramadol hydrochloride 50 mg/mL due to severe pain, and the doctor ordered a biopsy. The patient already had paresthesia at the umbilical level and on both lower limbs, clonus only during the preoperative period, spasticity and hypoesthesia.

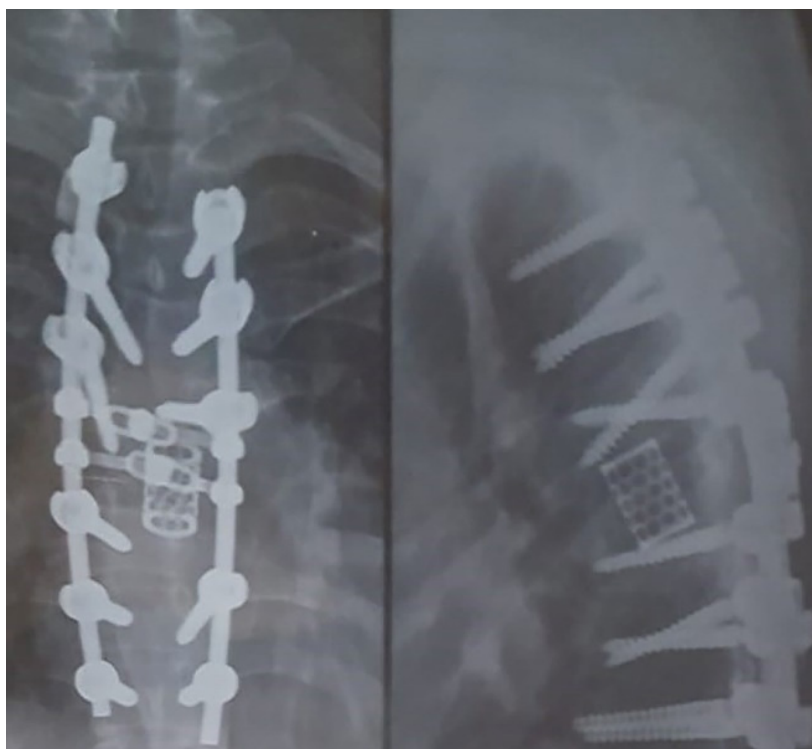
After these 15 days he was submitted to the surgical procedure without the result of the biopsy. The medical board decided not to wait, as the patient's condition worsened every day. The surgery lasted 10 hours and was conducted by 14 doctors. The procedure performed was the resection of the vertebrae T6 with vertebrectomy and arthrodesis and fixation of the vertebrae via T3-T9 (Figure 3). In the postoperative period, the patient had a pleural effusion, but drainage was not necessary. The patient spent a night in the Intensive Care Unit (ICU).



**Figure 1:** Sequence of the progression of the osteoblastoma in the patient studied



**Figure 2:** Sequence of the osteoblastoma developed in the T6 vertebra



**Figure 3:** Vertebrectomy and arthrodesis via T3-T9 vertebrae.

The left lower limb did not have any sequelae, but the right lower limb was the most affected after surgery, with hypoesthesia and spasticity. On the physical therapy evaluation, 8 days after surgery, the patient initially reported loss of trunk control and muscle strength and altered sensitivity. As for the classification of the injury, the patient had a functional level at T6, ASIA C18<sup>18</sup> with the following classification of muscle strength:

Right upper limb: C5 G5, C6 G5, C7 G5, C8 G5, T1 G5;

Left upper limb: C5 G5, C6 G5, C7 G5, C8 G5, T1 G5;

Left lower limb: L2 G4 / L3 G5 / L4 G3 / L5 G3 / S1 G3;

Right lower limb: L2 G2 / L3 G5 / L4 G3 / L5 G3 / S1 G3.

In the neuromuscular evaluation, the patient reported spasms in the lower limbs. Clonus or hyperreflexia

were not observed. The patient did not have contractures or deformities and the movement of the lower limbs was preserved, but there was muscle strength deficit and bilateral dorsiflexion. As for locomotion, the patient was unable to walk, so he used a wheelchair and needed the help of someone else. The patient also reported he needed visual stimulus to be able to walk.

Gait analysis revealed a proprioception deficit. On physical examination, muscle strength and skin sensitivity in the lower limbs were normal. Proprioception and Romberg tests were positive. The kinematic assessment showed compensations for slow and cautious gait: excessive anterior pelvic tilt and reduced pelvic motion in the other planes of motion, inadequate hip extension and reduced coronal plane range of motion, absence of knee flexion with bilateral hyperextension and greater flexion in the right side and reduced ankle movement on both sides.

Thus, doctors prescribed the use of orthoses and the use of a vest for 3 to 6 months, for complete spinal immobilization. However, this was not necessary, as within 1 week the patient started physical therapy and presented significant improvement. The result of the biopsy revealed few malignant cells, so radio- or chemotherapy were not necessary.

Currently, the patient has level 5 muscle strength in most muscles (5- normal muscle strength; 4 $\leq$  - muscle strength altered in relation to gravity and resistance) and weakness in the gluteal muscles, tibia and fibula, improvement of balance and proprioception, and has progressed to home walking with the aid of a walker and supervision. The patient goes to physical therapy, hydrotherapy and visual biofeedback sections at the CRER – Rehabilitation and Readaptation Center Dr. Henrique Santillo and has achieved significant improvement in gait. He uses Baclofen 10mg every 6 hours to decrease muscle spasticity.

## DISCUSSION

This study presented the report of a case of osteoblastoma, with complaints of paresthesia and hypoesthesia, confirming the association between neurological dysfunction and the osteoblastoma studied. However, it is known that osteoblastomas have more common clinical manifestations and neurological problems<sup>7</sup>.

In the case presented, the individual was 24 years old, meaning he was part of the risk group for the development of bone neoplasms. This is in accordance with the literature, which reports that one of the characteristics of this bone tumor is affecting individuals

between 20 and 30 years of age<sup>8</sup>.

According to the literature, 25% of the cases in which patients had imaging exams (radiography and resonance), the presence of a mass was diagnosed as malignant osteoblastoma<sup>9</sup>. Given the above, the imaging examination of the case studied here suggested a bone mass at the level of T6, confirming a benign osteoblastoma.

In the preoperative phase, the patient used intravenous tramadol hydrochloride 50 mg/mL for pain relief. This medication is indicated for moderate to severe pain relief (analgesia), regardless of the type of pain<sup>10,11</sup>.

In the postoperative period, the patient did not have to use the orthoses or the vest, as physical therapy with gait training exercises and strengthening of the spine was enough to guarantee a progressive improvement in gait. This is in line with the literature on physical therapy in the postoperative period of arthrodesis, which includes therapeutic exercises, gait training, active and passive stretching, postural re-education, strengthening of the spine and instructions on activities of daily living to protect the fixation site<sup>12,13,14</sup>.

The patient continues to use Baclofen 10mg every 6 hours to decrease muscle spasticity, which contributes to the improvement of gait. Baclofen is the first treatment option and the one with the fewer side effects for reducing spasticity in cases of spinal cord injuries<sup>15,16</sup>.

Benign bone-forming tumors in the spine are uncommon. However, they can cause spinal deformity, severe pain and neurological changes such as paresis, loss of trunk control and loss of muscle strength, most often in young males. The clinical presentation of osteoblastoma is aggressive and there is a high possibility of neurological deficit at the initial examination. The persistence of pain is a strong indication of residual tumor due to incomplete resection, while the return of pain suggests disease recurrence.

## CONCLUSION

This study has demonstrated that the definitive treatment must be surgical, with complete resection of the tumor. It was found that neurological injuries are more common in patients with a narrower vertebral canal that meets the spinal cord. As the disease progresses, there can be damage to the growth plate and degeneration or fibrosis of the paravertebral muscles.

The neurological recovery rate is 80 to 100% and physical therapy is indicated in 85% of cases<sup>17</sup>. In the case described here, the patient shows significant improvement in his physical and neurological condition. It is concluded that osteoblastoma is a rapidly progressive tumor that compromises the physical and psychological state of the patient, and its treatment is only surgical.



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