An Uncommon Giant Osteoblastoma in a Young Child: Our Experience and Literature Review

Sanjay Yadav, Ankur Goswami, G Vijayraghavan, Arvind Jayaswal

ABSTRACT

The present work emphasizes upon rare occurrence of giant osteoblastoma of lumbar spine (L4) in a 10-year old male child reporting to our spine clinic. He presented with back pain and visible swelling on flexion over back which disappeared on extension. He was evaluated clinically and radiologically. There was no neurological deficit. Tumor resection was done by posterior approach. The diagnosis was confirmed histopathologically. Postoperatively, pain disappeared completely. The purpose is to highlight such delayed presentations in developing countries and the importance of early diagnosis.

Keywords: Childhood osteoblastoma, Giant osteoblastoma, Spine tumors.

INTRODUCTION

Posterior spinal elements are the most common site for vascular benign pathologies, like osteoid osteoma and osteoblastoma. They were described separately by Jaffe and Lichtenstein. They are characterized radiologically by lytic lesions circumscribed by sclerosis. Conventionally, lesions less than 2 cm in size are called as osteoid osteoma and bigger than 2 cm are known as osteoblastoma. Pain is the classical symptom. Scoliosis may be a presenting feature. Recurrence can occur after resection. Complete removal is the prime surgical aim.

CASE REPORT

A 10-year-old male was referred to our spine clinic with lower right back pain for 6 months and a swelling visible on forward bending since 4 months. It was insidious in onset and gradually progressive. The pain was accentuated while exertion. On examination, there was localized bony hard swelling on the right side at the level of iliac crest. Paraspinal muscle spasm was present. Lumbar spine movements were restricted. Localized tenderness was present. There was no neurological deficit in lower limbs.

We thoroughly investigated the patient with plain roentgenograms, computed tomography (CT) scan and magnetic resonance imaging (MRI). Plain roentgenogram showed expansion of the right fourth lumbar transverse process and part of pedicle (Fig. 1A). Expansive osteolytic lesion with thin rim of cortex was found in the CT scan involving the transverse process and pedicle (Figs 1B and C). Magnetic resonance imaging images demonstrated lesion in the posterior elements with edema extending into the surrounding areas (Fig. 2A). The vertebral body was not involved and no compression of thecal sac was seen. Positron emission tomography (PET) scan showed the biological activity of the lesion (Figs 2B and C). The tumor was grouped as Enneking grade 3 for benign lesions.

He was planned for tumor excision by posterior approach. Intraoperatively, a bony hard, hypervascular, red to brown lesion involving the posterior elements of L4 vertebra was recognized surrounded by reactive capsule. Complete excision of the tumor was done with pseudocapsule. No evidence of any necrosis or cystic spaces could be made out in the tumor. The patient was relieved of back pain postoperatively and neurology was normal.

Histopathology analysis showed 5 × 4 × 3 cm gross specimen of bony swelling surrounded by pseudocapsule. On microscopy, tumor comprising thin-walled capillaries, spindle and osteoblastic cells in loose edematous stroma with focally laden osteoid matrix rimmed by osteoblasts were identified (Fig. 3). Occasional mitotic cells were also noted. These findings are consistent with the diagnosis of osteoblastoma.

DISCUSSION

An uncommon bone tumor, osteoblastoma, can account up to 1% of primary bone tumors and spine can be involved in 30 to 40% cases. Posterior spinal elements are commonly involved. Lumbar spine is second commonly affected after cervical spine. Pain is usually the initial clinical symptom which can lead to scoliosis and...
torticollis. Neurological involvement is more common than osteoid osteoma.

Radiographs usually show a well-defined lytic process in the cortical bone, but may extend into the surrounding soft tissues. This is more common in spinal column probably because the limited bony volume cannot contain the amount of tumor growth at this site. Aggressive osteoblastoma can display rapid resorption of adjacent host bone and extend into the surrounding soft tissues. Also, osteoblastoma may have features resembling malignancy, like cortical destruction and extraosseous soft-tissue spread.

Diagnostic delay is common with an average symptom to diagnosis time period of 6 to 12 months. Histopathology is an important confirmatory tool. However, even with an appropriate, representative tissue sample, it is sometimes very difficult to differentiate these aggressive (stage 3) lesions from osteosarcoma. Histological clues to differentiation from osteosarcoma are very low mitotic rate, minimal cellular atypia, peripheral maturation or zonation, no permeation of surrounding bone and absence of cartilaginous matrix in osteoblastoma. In fact, this patient was referred as osteosarcoma diagnosed by fine needle aspiration cytology from a peripheral center. Immunohistochemical analysis may also help in the diagnosis, but it is not available everywhere. Tumor cells for osteoblastoma may show a different reactivity pattern for Figs 1A to C: (A) Plain X-ray—AP and lateral views showing expansion of the right L4 transverse process with involvement of pedicle and (B and C) CT scan—axial and coronal images showing expansive osteolytic lesion with thin rim of cortex involving the transverse process and pedicle at the same level

Figs 2A to C: (A) Magnetic resonance imaging showing the lesion in posterior elements with edema extending into the surrounding areas (right L4 level) and (B and C) positron emission tomography scan showing biological activity of the lesion (right L4 osteoblastoma)
the expression of cyclo-oxygenase-2 (COX) than atypical osteoblastic cells in osteosarcoma.\textsuperscript{10}

Complete surgical resection is the treatment of choice for osteoblastoma. Saglik\textsuperscript{11} et al in a study reported that intralesional curettage was the most commonly applied modality of treatment with 13\% recurrence rate. They concluded that osteoblastoma may be locally aggressive and may recur after removal. Wide excision should be considered with regular long term follow-up. Aggressive grade 3 lesions can recur in about 10\% of cases.\textsuperscript{12} Possibility of malignant transformation is remote but should be borne in mind.\textsuperscript{3}

**CONCLUSION**

Giant osteoblastoma is an uncommon tumor but its importance in being aggressive and capability to transform into malignancy should be considered. Long-term follow-up is important. Interdisciplinary coordination is necessary between orthopedic surgeon, pathologist and radiologist.

**REFERENCES**