Aneurysmal Bone cyst of Lumbar Spine: Case report and Review of Literature

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ABSTRACT

Aneurysmal bone cysts (ABCs) are benign bone lesions arising mostly in the pediatric population that can cause local pain, swelling, and pathologic fracture. It is occasionally an aggressive benign lesion whose treatment of choice is complete resection, even though the risk of profuse intraoperative bleeding exists. We here report a case of spinal aneurysmal bone cyst treated by surgery and adjuvant radiotherapy.

Keywords: Aneurysmal bone cyst, Surgery, lumbar, Radiotherapy.

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I. INTRODUCTION

An aneurysmal bone cyst is a benign, locally proliferative vascular bone disorder that occurs in children and adolescents [1]. Long bones are more frequently involved in the metaphysis, but approximately 12% to 30% of lesions involve the spine. In spine lumbar region is the most common site, followed by the thoracic spine and cervical spine [2], [3]. Treatment of aneurysmal bone cysts are excision, curettage, and bone grafting, as they are hypervascular, there is a risk of excessive bleeding. Occasionally, the problem encountered is obtaining adequate stabilization of the spine [4]. We here report a case of spinal aneurysmal bone cyst treated by surgery and adjuvant radiotherapy.

II. CASE REPORT

A 23-years male presented in the Neurosurgery outpatient department with complaints of pain, paraesthesia, and swelling right side back for five months. On neurological examination, there was a decreased sensation of the distal dermatomes from T10. Power was 5/5 in bilateral upper and lower limbs. MRI spine showed well defined multiloculated septated expansile lesion of size 8 x 6 x 7cm is arising from the body and posterior element of L2 vertebrae. The loculi in the lesion showed differential attenuation in fluid levels with dependent T2 hypointensities. The lesion compressed the right exiting nerve roots of L1-L2 and L2-L3 levels with

intraspinal extradural extension causing displacement and compression of the thecal sac. Posteriorly lesion was extending into right psoas and right erector spinae muscle (Fig. 1).

Fig. 1. T2 axial MRI spine showing well defined multiloculated septated expansile lesion of size 8 x 6 x 7cm arising from the body and posterior element of L2 vertebrae.

The patient underwent near-total excision of the lesion with L1-L3 transpedicular fixation for stabilization. Intraoperatively, there was a large expansile lesion arising from the L2 vertebral body and was destroying the right half of the L2 vertebral body, L2-L3 facet joint, and transverse process as well as the right half of lamina of L2. The lesion

was highly vascular, not invading surrounding paraspinal muscles. The thecal sac was displaced to the left side by the lesion at the L2-L3 level. Histopathology reported benign cystic lesion, constituted by cystic spaces filled with blood with fibrous tissue walls, lined by flat cells. The established diagnosis corresponded to aneurysmal bone cyst L1-L3 (Fig. 2 a, b).

Fig. 2. (a) Sheets of bland spindled cells, foci of woven bone, scattered osteoclastic giant cells (H&E x100) (b) Cystic spaces lined by osteoclastic giant cells (H&E x400).

Postoperatively patient received adjuvant radiation by conventional technique dose 30Gy/15 fractions to the lumbar region. He tolerated the treatment well.

III. DISCUSSION

Dr. Jaffe and Lichtenstein first described aneurysmal bone cysts (ABCs) in 1942. The name of ABC is a misnomer because they lack endothelial wall and are neither cystic nor aneurysmal. They are usually expansile blood-filled cavities within the bone lined by proliferative fibroblasts, giant cells, and trabecular bone [5]. Eighty percent of patients present in the first two decades of life. Females have a higher preponderance than males. Common presenting symptoms of ABC are ill-defined somatic pain, stiffness, and swelling with associated bone destruction and pathologic fracture. ABC usually arises in the metaphysis of long bones but also occurs in the spine, clavicle, foot, and fingers. In the spine, it arises from posterior elements of a vertebra, spreads into the pedicles and body, and can also expand to the spinal canal, resulting in pathological fractures and neurological deficits [6]. It may occur in the bone as a solitary lesion or in association with other tumors, e.g. giant cell tumors, osteoblastoma, chondroblastoma, chondroid myxoma, fibroma, and fibrous dysplasia. Familial type incidence has been established. In cytogenetic studies, alteration of the short arm of chromosome 17 has been identified, with translocation in the long arm of chromosome 16, suggesting a hereditary component in the etiology [7]. The key factors to the successful management of the ABC spine are early diagnosis and appropriate surgical treatment.

The study of aneurysmal bone cyst is facilitated with diagnostic studies (computerized axial tomography and magnetic resonance imaging). On MRI presence of multiloculated fluid-fluid filled cysts is characteristic of ABC. Still, it can be confused with other types of lesions such as osteosarcoma or giant cell tumors, so biopsy of the lesion is necessary to obtain a definitive diagnosis [8].

The treatment of ABC includes curettage with or without bone grafting, complete excision, arterial embolization,

intralesional drug injections (steroid and calcitonin), and radiation [9], [10]. An optimal approach for local control of the tumor is achieved by total excision with or without instrumentation, and it prevents recurrence. Radiotherapy consists of external beam radiation to induce cellular death. Radiotherapy has been used historically to treat ABCs primarily, as adjuvant therapy in cases of recurrence, and inoperable ABC lesions. In a 2015 case series of 12 patients treated with radiotherapy for ABC, Zhu et al. reported no recurrence and no complications at the final follow-up [11]. Feigenberg et al. advocated radiotherapy to nine patients with recurrent (4 patients) or inoperable ABC (5 patients). The dose prescribed ranged from 20-60 Gy. Only one patient was treated up to 60 Gy, while most of them ranged up to 30 Gy. No local recurrence was seen in the median follow up of 17 years. Apart from the mentioned treatment in literature the emerging treatment modalities for ABC are include curettage, percutaneous doxocycline, bisphosphonates and RANKL inhibitor denosumab administration [12].

IV. CONCLUSION

Aneurysmal bone cysts are aggressive benign lesions with high rates of recurrence rendering its treatment uniquely challenging. Adjuvant treatment or alternative treatment strategies depend on one's experience and institutional preference. The treatment decision has to be balanced for treatment associated morbidity with disease recurrence.

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