

Case Report

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1 Introduction

A benign blood-filled cystic tumor of bone, an aneurysmal bone cyst (ABC) can affect any part of the skeleton. Although it may manifest as a primary tumor, ABC-like alterations can exacerbate in other bone neoplastic disorders. It is equally prevalent in patients who are male and female, and it typically affects skeletally immature individuals, particularly those who are in their first two decades of life ¹.

Ten to thirty percent of ABCs are located in the spine. Traditionally, such lesions have been treated with curettage or other intralesional procedures. Because ABCs can be locally

Aneurysmal Bone Cyst of Vertebrae: A Rare Case Presentation

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Abstract

Aneurysmal bone cysts are non-malignant, tumor-like vascular lesions that can grow rapidly, inflict local impairment, and weaken bones to the point of pathologic fracture. They are more common in pediatric patients and can cause severe morbidity, particularly if they involve the development plate of bones. The present case study describes a 13-year-old girl said with a complaint of back pain for three months. Plain radiography of the AP and lateral views of the LS spine, MRI spine, CT images, Histopathology confirmed the diagnosis of Aneurysmal bone cyst of vertebrae and patient underwent Posterior spinal stabilization D12-L2 vertebrae with interbody expandable cage. Patient's symptoms improved upon regular follow up. Patient specific evaluation and meticulous surgical technique for debulking(curettage) and stabilizing the spine to reduce morbidity and recurrence of ABC.

Keywords: Aneurysmal bone cyst, Bone tumor, Spine tumor

aggressive, intralesional resection may be inadequate, resulting in recurrence ².

The etiology of an aneurysmal bone cyst is unknown. It is theorized that the aneurysmal bone cyst is a reactive, non-neoplastic process capable of destroying and expanding bone ³.

It may appear in bone as a solitary lesion or in conjunction with other bone tumors such as giant cell tumor, chondroblastoma, chondromyxoid fibrous dysplasia, or in association with a malignant process ³.

In present article we present a case report of aneurysmal bone cyst of vertebrae in a 13 year old girl.

2 Case Report

A 13-year-old girl stated that she had been suffering from back pain from three months. Pain radiating to the left thigh and groin region since 3 months and has low back ache since 1 month. No signs of Numbness/tingling sensation are noticed. Initially patient was treated conservatively with analgesics. After 2-3 weeks pain progressed and was not alleviated by medication.

On further investigation patient is advised to take a plain radiography of the AP and lateral views of the LS spine. Radiograph showed that the left half of the L2 vertebrae and the left pedicle have a well-defined, expansile lytic lesion. Although the adjacent transverse process was not visible, it was probably implicated.

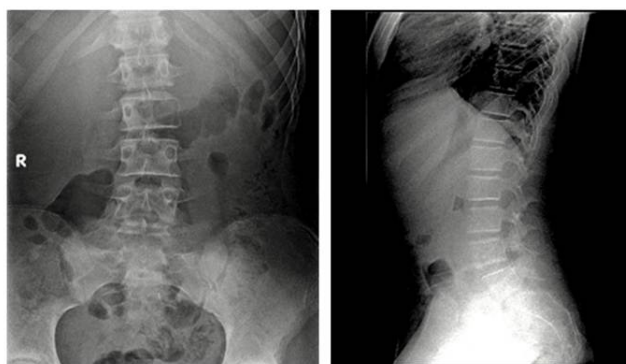


Fig. 1: Plain radiography of the AP and lateral views of the LS spine

CT scan: Patient is further advised for CT scan. CT images show a large expansile lytic lesion epicentered in left half of L2 vertebral body, pedicle, superior & inferior articular facet, transverse process, bilateral laminae and spinous process. Soft tissue window shows fluid-fluid levels.

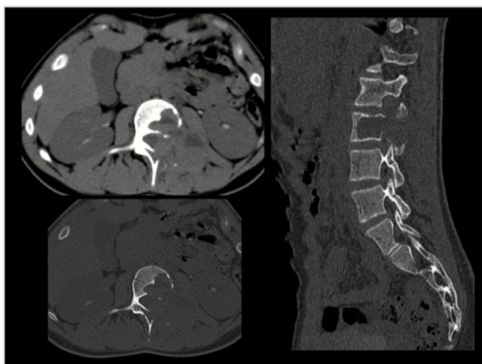


Fig. 2: Lesion in left half of L2 vertebrae

MRI Scan: Patient was advised with MRI spine and the imaging technique used in lumbar spine: Sag: T1 SE. T2 TSE Axial - T2 TSE

and T1 SE. T2 Sagittal whole spine composition in 1.5T MR scanner followed by post contrast fat sat T1 sequence of lumbar spine.

Observations include Sacralization of L5 vertebral body (Type IIb), Mild lumbar scoliosis noted towards left side, A well-defined, expansile T1 isointense, T2 heterogenous hyperintense lesion with multiple thin-walled cystic cavities showing fluid-fluid levels together measuring ~ 5.0 x 4.3 x 4.6 cm (APx TR *CC) is noted epicentered in left half of L2 vertebral body, left pedicle, left superior & inferior articular facet, left transverse process, bilateral laminae and spinous process. Few T1 hyperintensities noted within- likely acute hemorrhage. On post contrast study, the lesion shows peripheral & septal enhancement.

The lesion shows no restriction of diffusion on DWI. The lesion is seen abutting and displacing the adjacent thecal sac and cauda equina towards right side. It is also seen abutting the left ligamentum flavum and is seen displacing it antero-medially; however no obvious stenosis of spinal canal noted.

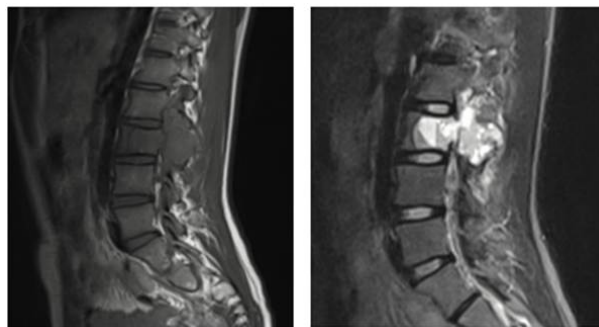


Fig. 3: MRI spine showing fluid-fluid levels noted epicentered in left half of L2 vertebral body

The lesion is causing complete obliteration of left lateral recess and neural foramina at L1-L2 level with compression of left exiting & traversing nerve roots. It is also causing mild narrowing of left lateral recess and neural foramina at L2-L3 level and abutting left exiting nerve root. Mass effect is noted in the form of indentation of adjacent psoas and erector spinae muscles with surrounding mild T2/STIR hyperintensity.

Correlative CT shows a large expansile lytic lesion epicentered in left half L2 vertebral body, left pedicle, left superior & inferior articular facet, left transverse process, bilateral laminae and spinous process. Rest of the vertebral bodies reveal normal signal intensities.

Inter vertebral discs showed normal signal of the disc. The MRI reports are concluded with the impression that a well-defined, expansile T1 isointense, T2 heterogenous hyperintense lesion with multiple thin-walled cystic cavities showing fluid-fluid levels epicentered left half L2 vertebra showing peripheral & septal enhancement as described- Features suggestive of Aneurysmal bone cyst and suggested histopathological correlation.

The lesion was sent to biopsy received multiple dark brown hemorrhagic irregular tissue pieces with save to whitish tissue pieces (ligament) altogether measuring 2x2x1cm. All processed-A1,A2.

Histopathology confirmed Blood-filled cystic spaces separated by a spindle cell stroma with osteoclast like giant cells and osteoid production in the L1 vertebral body.

Patient underwent Posterior spinal stabilization D12-L2 vertebrae with interbody expandible cage. Patient's symptoms improved upon regular follow up.

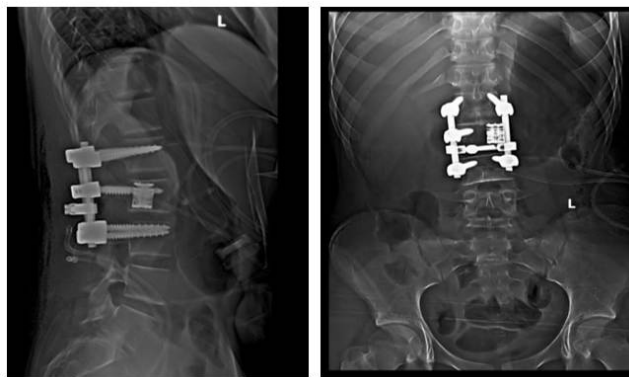


Fig. 4: D12-L2 vertebrae with interbody expandible cage

3 Discussion

An aneurysmal bone cyst (ABC) is a cystic lytic bone lesion with blood lacunae separated by connective septa. In 30% of cases, ABC is located inside another bone diseases such as giant cell tumor, osteoblastoma, chondroblastoma, and telangiectatic osteosarcoma are common causes, with 70% of cases occurring as primary lesions³.

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Enneking identified three stages of ABC: latent (grade 1), active (grade 2), and aggressive (grade 3). Although ABCs of the spine are benign, they can be aggressive locally, resulting in an Enneking stage 3 categorization for benign musculoskeletal lesions. Local recurrence of ABC after initial treatment can be challenging to manage, leading to substantial neurological and structural damage^{4,5}.

Effective therapy of spinal ABCs requires selecting and delivering the proper index treatment. ABCs can be treated using several approaches, including as intralesional resection, en bloc resection, and selective arterial embolization (SAE). Although en bloc resection is more effective at preventing recurrences, its benefits must be balanced with increased morbidity. If intralesional resection is attempted, preoperative embolization is strongly suggested to prevent severe intraoperative bleeding². To minimize surgical risks, SAE alone is a potential therapy option according to Barbanti-Brodano.

Similar to our study, Nukaga *et al.* performed a surgery in a 19 yrs girl with aneurysmal bone cyst of L5 and placed pedicle screws into L4 and S1, and an expandable cage packed with autologous bone chips between the vertebral bodies to reconstruct the lumbar spine's anterior strut. After surgery, she had completed pain relief. At two years follow up, CT and MRI showed no apparent signs of recurrence⁶.

In accordance to our study similar surgical procedure was done by Bayounis AM *et al.* to a 11-year-old boy diagnosed with ABC at a location of L2. pedicle screws in L2-3 was placed along with bone grafting for fusion, as the facet joints at the level of L2 and L3 were destructed by the bone cyst. Closure in layers after inserting a drain was done with sterile dressing followed by pressure dressing. A plaster body jacket cast was applied postoperatively for extra support to the fixation⁷.

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