Aneurysmal Bone Cysts of the Spine: Two Case Reports

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INTRODUCTION

Aneurysmal bone cysts (ABCs) are rare entities which cause expansile and destructive bone lesions characterized by reactive proliferation of connective tissue. They usually grow rapidly with hypervascularity. They are benign lesions and can occur in any part of the skeleton and the spine can be affected up to 30% of the cases. ABCs can cause symptoms such as back and/or dorsal pain, neurological deficits, and pathological fractures. Local traumas usually start the clinical aspects. They usually affect young adolescents. Although ABCs mostly occur in the distal part of the femur and/or proximal part of the tibia, some cases have been reported in the pelvis and posterior elements. ABCs can occur rarely in the sacrum and this location has some difficulties in treatment because of the relations with the sacral nerves. Togetherness of ABC and fibrous dysplasia, giant cell tumors and/or osteoblastomas are defined as secondary ABC by some authors and this association was seen approximately in 20-30% of cases. Diagnosis can be verified by CT scans and MRI. In this paper, authors reported two rare cases with thoracic and sacral aneurysmal bone cysts.

CASE REPORT

Case 1

A 14-year-old male admitted to neurosurgery department with suffering of being unable to walk for 15 days. His neurological examination revealed paraplegia. Thoracic MRI images and CT scans demonstrated a mass which causes mass effect on spinal cord (Fig. 1). He underwent surgery and total laminectomy was performed. Intraoperatively, we determined a huge hemorrhagic mass. Once the cavity was opened severe bleeding...
occurred. The cyst removed totally. The bone tissue of the removed cyst area is covered by bonewax. The histopathological examination revealed as ABC (Fig. 2). On postoperative 2nd day he was mobilised and his neurological examination was enough for walking with arm holder on postoperative 7th day. On the 5th months control of the patient there were no suffering and no instable images on X-ray and MR images (Fig. 3).

Case 2

An 8-year-old male patient admitted to us with right hip and back pain. In his history, he had fallen down from 2 meters. Neurological examination was normal. Spinal MRI revealed ABC on the right side of the 3rd sacral vertebra with an enlargement of 24×19 mm (Fig. 4). The second case is under control and no surgical treatment is suggested because of the patient’s age and observing no neurological deficits at the patient.

DISCUSSION

Known as a non-neoplastic expansile bone lesion, ABC has a consistence of blood-filled spaces separated by connective tissue septa containing bone and osteoclastic giant cells. Most cases are under 20 years. The incidence of thoracic and sacral ABCs are not known clearly. In literature, discussions about thoracic and sacral aneurysmal bone cysts are limited and only a few cases have been reported\(^3\). Papageiopoulo et al described 44 pelvis ABCs and 12 of them were in the sacrum\(^6\).

It is well known that total extirpation of SABC is so difficult and surgical results in treatment of SABC are excellent. Surgery for thoracic region is easier than sacral region. Neurological manifestations of sacral neoplasms are common. These clinical findings include leg weakness and numbness, bowel or bladder dysfunctions. In our cases there was only pain on hip and back that occurred by mobilisation\(^1\).

Up to 60-70% of ABC cases that occurred in spine present with neurological deficits. The clinical aspects are pain due to the destruction and neurological deficits due to the fractures and compression. In our case the patient had severe findings

![Fig. 2](image1.png)
Fig. 2. Histopathology reveals blood filled cystic cavities covered by stroma including proliferating fibroblast and scattered multinucleated giant cells rather than endothelium (H&E ×40-100).

![Fig. 3](image2.png)
Fig. 3. T2 sagittal, axial T2, T1 sagittal images show that the mass is totally removed and no mass effect is seen on medulla. Post operative changings can be seen in Posterior spine tissue. On X-ray images no significant finding is observed.

![Fig. 4](image3.png)
Fig. 4. (A) On axial T2 images, hyperechoic mass with liquid levels is seen on the half right of sacrum. (B) on T1 sagittal images, hypointens mass is observed in sacral region.
including paraplegia\textsuperscript{2-7}).

The diagnostic problems are because of the expeditious growth of ABC and its expansive destruction of bone. The diagnosis becomes more complicated if there is an extra-osseous and soft-tissue tumour mass. MRI is the most useful modality for preoperative planning. It also helps to evaluate the fluid-fluid level, which is characteristic for ABC on MR images\textsuperscript{1}).

Our first case was evaluated as a pathological fracture, and the patient underwent urgent surgery because of the compression on spinal cannal. After pathological examination, a diagnosis of ABC was given. But the second case was so typical for ABC on the radiological examinations as if in the literature.

The primary option for treatment is surgery. Enneking classified 3 surgical types: 1-intralesional (curettage and bone grafting), 2-marginal (en bloc) resection, 3-wide resection (segmental resection)\textsuperscript{3-7}). The most important factors in preoperative planning are the location and the growing pattern of the ABC. If ABC is growing superficially and besides if it is not involving the one-third of the bone, in this case it will be more advantageous. Intra-lesional excision can be performed in those cases. And this is really a good intervention for ABC and local recurrences occur less commonly. Besides this, if the ABC is so large and located in pelvis or spine extraperitoneal excision and bone grafting could be more difficult and risky. In similar cases like this, curettage and bone grafting remain a choiceable surgical technique.

Low-dose radiotherapy can be performed after curettage and bone grafting as an other option for treatment\textsuperscript{9}. Another option is preoperative embolisation, if the lesion is highly vascular.

**CONCLUSION**

Age, location, size and number of mitotic figures have been suggested for recurrence. Treatment of ABC is difficult and histological examination should be done to prevent overlooked of an underlying more aggressive neoplasm.

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