

Aneurysmal Bone Cyst of Thoracic Spine in an Elderly Treated by Two Stage 360° Surgical Excision and Reconstruction with Expandable Cage – A Case Report

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Learning Point of the Article:

Two-stage surgery for ABC- first stage posterior stabilisation and biopsy followed, a week later, after HPE confirmation, by second stage anterior corpectomy and reconstruction with cage is an effective method to treat ABC of thoracic vertebra.

Abstract

Introduction: Aneurysmal bone cysts (ABCs) are rare, representing about 1% of primary bone tumors and 15% of all primary spine tumors. When they are located in poorly accessible regions such as the spine and pelvis, their management can be challenging. Treatment options include selective arterial embolization, curettage, en bloc excision with reconstruction, and radiotherapy.

Case Report: A 68-year-old male presented to the outpatient department with complaints of left flank pain and abdominal pain for 4 months. Clinical examination showed tenderness in the thoracolumbar region with other spine examinations within normal limits. Magnetic resonance imaging dorsal spine showed an expansile lytic multiloculated lesion in the T11 vertebral body with mild extramedullary thoracic cord compression with subtle cord edema. The lesion showed a multiloculated bubbly appearance with fluid-layered locules. He underwent 2 stage procedure. In the first stage, posterior decompression, posterior stabilization, and biopsy were done. The histopathology report was consistent with ABCs. In the second stage, T11 corpectomy, tumor excision, and reconstruction with an expandable cage were done. Postoperatively his pain was reduced and was neurologically intact. At 4-year follow-up, clinically, he has excellent functional outcome and free of recurrence.

Conclusion: 360° excision and reconstruction is an effective treatment option for ABCs of spine in the elderly.

Keywords: Aneurysmal bone cyst, thoracic spine, surgical excision, and reconstruction, curettage.

Introduction

Aneurysmal bone cysts (ABCs) are rare skeletal tumors that are benign, locally aggressive lesions and most commonly occur in the first two decades of life [1]. ABC comprising 1.4% of all primary bone tumors and 15% of all primary spine tumors. Among spine, thoracic (32%) and lumbar (34%) spine involvement is common [1, 2]. Clinically, patients present with back pain, pathological fractures, instability, and neurologic

deficits [2, 3]. The ideal treatment for ABC in the thoracic spine is controversial. Treatment options include selective arterial embolization (SAE), direct intralesional injection of sclerosant, intralesional excision (curettage), en bloc excision and reconstruction, and/or radiotherapy. The clinical course of ABCs is sometimes unpredictable and local recurrences have been described with various types of treatments [4, 5]. En-bloc resection appears to have the highest rate of cure. Spinal

Author's Photo Gallery



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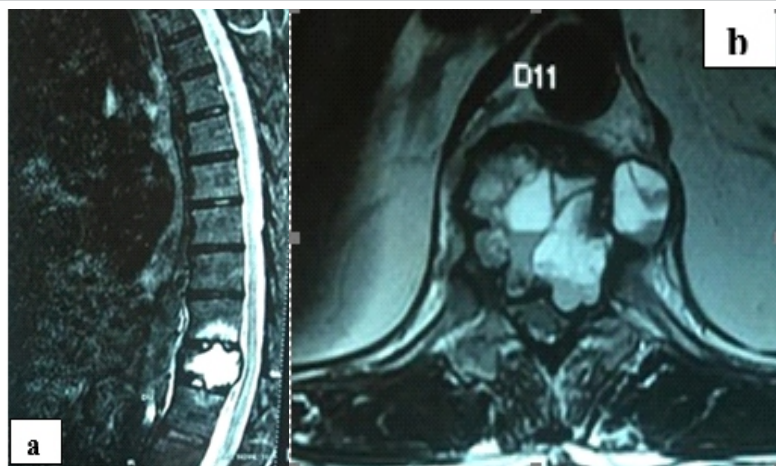


Figure 1: (a and b) T2 weighted sagittal and axial magnetic resonance imaging showing expansile lytic multiloculated peripherally enhancing lesion involving T11 vertebra. Lesion showing multiloculated bubbly appearance with fluid layered locules.

stabilization appears to provide the optimal method of acquiring a high degree of local control and preventing or correcting spinal deformity and instability [6-8]. We report a case of thoracic spine ABC, treated as a two-stage surgical procedure with 360° excision and reconstruction with an expandable cage.

Case Report

A 68-year-old male presented to the outpatient department with complaints of left flank pain and abdominal pain for 4 months. The patient did not have any history of trauma, fever, or previous surgery related to this event. Clinical examination showed tenderness over the thoracolumbar region with other spine examinations within normal limits. He did not have any motor or sensory deficits.

Investigations

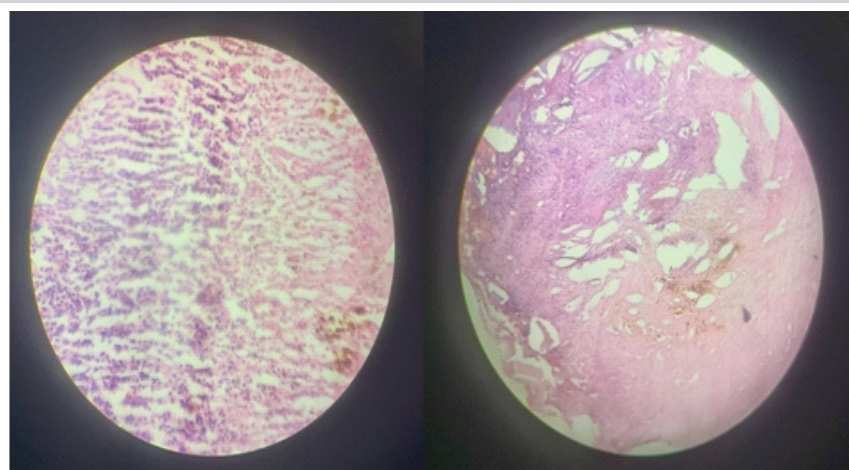


Figure 2: Histopathology microscopic images showing cystic lesion with fibrovascular wall and contains blood, osteoclastic giant cells, and woven bone.

X-ray evaluation showed a pathological fracture of the T11 vertebra. Magnetic resonance imaging (MRI) dorsal spine showed expansile lytic multiloculated peripherally enhancing ill-defined lesion with a wide zone of transition replacing the entire normal marrow of the T11 vertebral body with grade II to thecal sac indentation, mild extramedullary thoracic cord compression with subtle cord edema. The lesion showed a multiloculated bubbly appearance with fluid-layered locules suggesting a possibility of ABC (Fig. 1). Differential diagnoses include Giant cell tumor, simple bone cyst, osteoblastoma, telangiectatic osteosarcoma, metastases, and plasmacytoma.

Diagnosis

His initial diagnosis was pathological fracture T11 with cord compression. In view of uncertain diagnosis, planned for a two-stage surgical procedure with decompression, stabilization, and biopsy in the first stage and resection and reconstruction in the second stage.

Treatment

The patient underwent two two-stage procedure.

First stage

Posterior decompression, posterior stabilization, and biopsy were done. Bilateral pedicle screws inserted at T9, T10, T12 and L1. T11 posterior decompression was done by left hemilaminectomy and biopsy taken from T11 vertebra. The histopathology (HPE) report was consistent with ABC (Fig. 2).

Second stage

T11 corpectomy, tumor excision, and reconstruction with an expandable cage. Done 1 week after the first. Left lower thoracotomy. The 9th rib was exposed subperiosteally and excised. Pleura incised and the thoracic cavity entered. T11 was identified under c-arm guidance. ABC identified and removed in piecemeal. T11 corpectomy was done under the operating microscope. The defect is filled with local autograft and an expandable cage. Post-operative period, the patient was ambulated on day 1 with motor and sensory intact (Fig. 3,4).

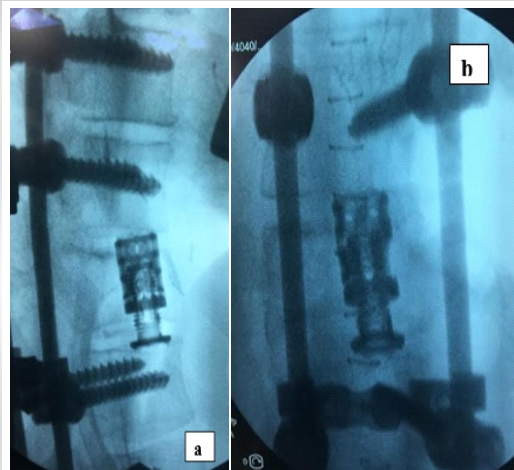


Figure 3: (a and b) Intraoperative fluoroscopy image showing the position of expandable cage.

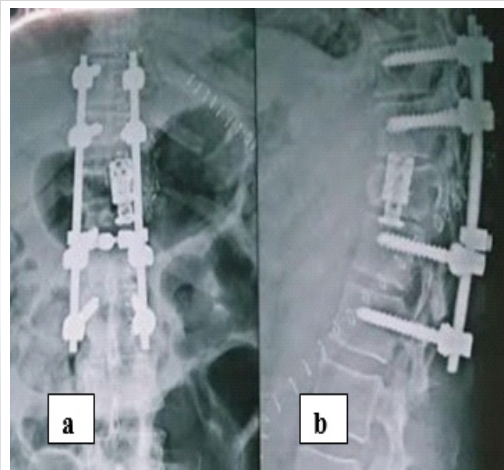


Figure 4: (a and b) Postoperative anteroposterior and lateral X-ray.

Follow up

At 4-year follow-up, clinically he has excellent functional outcome and is free of recurrence (Fig. 5 and 6).

Discussion

ABCs are a rare, benign locally aggressive type of lesion that usually appears in the early to mid-20s. They make up around 1% of primary bone tumors and 15% of primary spine tumors. Among the spine lumbar involvement is the most common, followed by the thoracic spine and cervical spine [1, 2]. Here we report a case of thoracic spine ABC in an elderly patient. ABC arises from posterior elements of a vertebra and later involves the pedicles and vertebral body. Later on, there can be an intraspinal extension, which can cause neurological deficits [2]. Patients with an ABC often present with pain in the affected area along with neurological deficits. Paresthesia, paresis, and abnormal gait are common neurological manifestations when

the spine is involved [1, 2]. We present a case of an elderly male patient with left-sided flank pain and abdominal pain and no other significant neurological symptoms. Computed tomography imaging typically shows an expansile, lytic lesion with a thin cortex and septae. MRI shows contrast enhancement with edema and fluid-fluid levels [9]. In this case, X-ray evaluation showed a pathological fracture of T11 thoracic spine, and MRI

showed expansile lytic multiloculated peripherally enhancing ill-defined lesion with a wide zone of transition replacing the entire normal marrow of the T11 vertebral body. The lesion showed a multiloculated bubbly appearance with fluid-layered locules. The differential diagnosis of lytic and expansive bone lesions includes solitary bone cyst, ABC, giant cell tumor, enchondroma, telangiectatic osteosarcoma, metastases, and plasmacytoma [2]. Treatment options for ABC are SAE, direct intralesional injection of sclerosants, intralesional excision (curettage), en-bloc excision and reconstruction, and/or radiotherapy [4,5]. We treated it with a 2-stage surgical procedure with posterior decompression, posterior stabilization, and biopsy in the first stage. HPE report was consistent with ABC. In the second stage T11 corpectomy, tumor excision and reconstruction with an expandable cage were done.

Complete excision was achieved through the en bloc technique, However, this is a difficult procedure and has only been

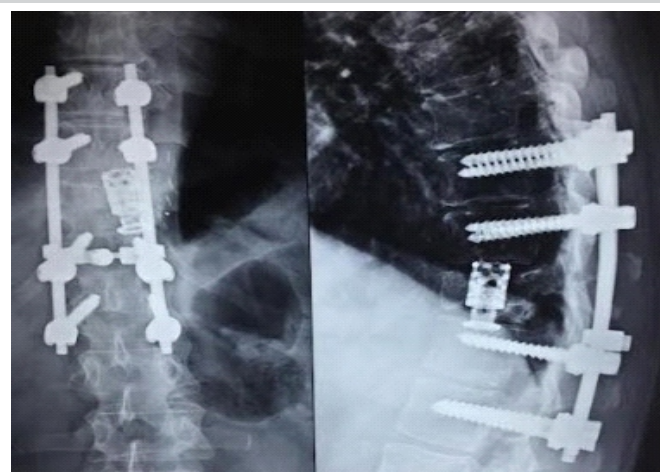


Figure 5: 2-year follow-up X-ray showing well-positioned implants and no features of recurrence.

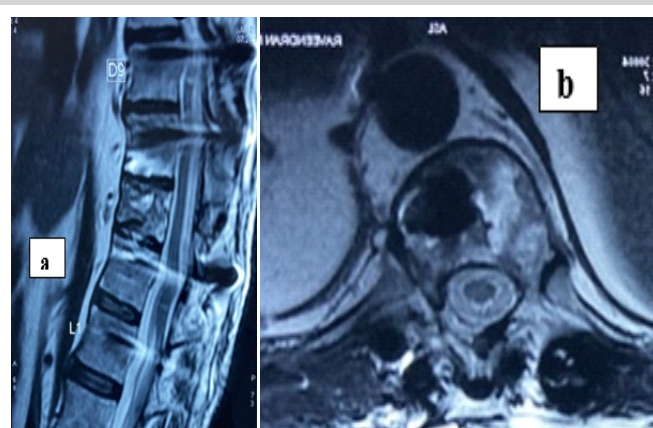


Figure 6: (a and b) T2 weighted sagittal and axial magnetic resonance imaging, 34 months postoperatively showing resolved status of the aneurysmal bone cyst with no recurrence.

reported in rare cases [10]. The most common outcome of surgery is complete, piecemeal intralesional resection of ABC. The entire ABC must be removed, including all cyst walls and any abnormal tissues. In some cases, aggressive curettage may be used with high-speed drills to cut back into healthy bone. If the lesions are large and extensive, the most likely outcome is complete resection, which will likely result in iatrogenic instability and may necessitate instrumented fusion [2, 8,9]. In this case, the postoperative period was uneventful. At 2 years follow up he demonstrated excellent functional outcome and showed no evidence of recurrence.

Conclusion

360° excision and reconstruction is an effective treatment option for ABC of spine in the elderly.

Clinical Message

Two stage surgery for ABC- first stage posterior stabilisation and biopsy followed, a week later, after HPE confirmation, by second stage anterior corpectomy and reconstruction with cage is an effective method to treat ABC of thoracic vertebra.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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Consent: The authors confirm that informed consent was obtained from the patient for publication of this case report

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