

# Aneurysmal Bone Cyst of C2, C3 Cervical Spine: A Rare Case Report and Review of Literature

<sup>1</sup>MA Naveen, <sup>2</sup>Vikas Naik, <sup>3</sup>GC Keshav, <sup>4</sup>SA Santhosh Kumar, <sup>5</sup>Sanjeev Balaji Pai

## ABSTRACT

Aneurysmal bone cysts (ABCs) are benign lesions occurring predominantly in metaphysis of long bones. Lesions involving the cervical spine comprise 1% of all spinal ABCs. We report a rare case of C2, C3 ABC in a 39-year-old male patient, who presented with progressive weakness of all four limbs since 8 months. Magnetic resonance imaging (MRI) of spine showed an expansile osteolytic mixed intensity lesion with fluid level involving the body of axis and left pedicle causing significant compression on thecal sac posteriorly suggestive of ABC. Decompression of the cyst along with occipitocervical stabilization with iliac crest bone grafting by combined anterior and posterior approach was done. Histopathological examination revealed trabeculated, dilated vascular beds consistent with the diagnosis of ABC. The patient's neurological status improved immediately after surgery and he continues to do well 6 months postoperatively.

**Conclusion:** Aneurysmal bone cyst of the cervical spine is very rare. It requires thorough neural decompression and 360° fusion for better stability and outcome.

**Keywords:** Aneurysmal bone cyst, C2, C3 vertebrae, 360° fusion.

**How to cite this article:** Naveen MA, Naik V, Keshav GC, Kumar SAS, Pai SB. Aneurysmal Bone Cyst of C2, C3 Cervical Spine: A Rare Case Report and Review of Literature. *J Spinal Surg* 2015;2(2):52-54.

**Source of support:** Nil

**Conflict of interest:** None

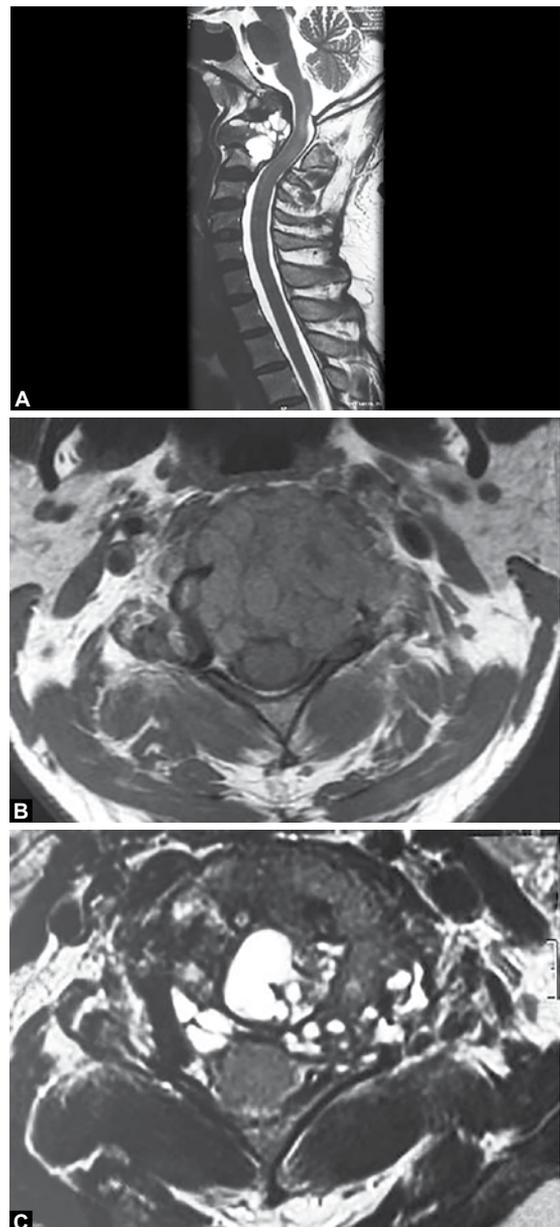
## INTRODUCTION

We report a rare case of a 39-year-old male patient with the history of neck pain and progressive weakness of all four limbs since 8 months.

A neurological examination revealed severe spastic quadriparesis in all four limbs. The deep tendon reflexes in all four limbs were exaggerated and the Babinski responses were extensor bilaterally. Sensory examination was unremarkable. No mass was palpable in the neck.

Magnetic resonance imaging (MRI) of spine revealed an expansile osteolytic mixed intensity lesion with fluid

level involving the body of axis and left pedicle causing significant compression on thecal sac posteriorly and a large prevertebral soft tissue component suggestive of aneurysmal bone cyst (ABC) (Figs 1A to C). Computed



**Figs 1A to C:** (A) Magnetic resonance imaging scan of the cervical spine T2W sagittal sequence showing hyperintense lesion involving C2 vertebral body causing significant compression on the thecal sac, (B) MRI scan of the cervical spine T1W axial image showing expansile isointense lesion involving C2 vertebral body and the left pedicle and (C) MRI scan of the cervical spine T1W contrast image showing heterogeneously contrast enhancing mixed intensity lesion

<sup>1,3,4</sup>Senior Resident, <sup>2</sup>Assistant Professor  
<sup>5</sup>Professor and Head

<sup>1-5</sup>Department of Neurosurgery, Bangalore Medical College and Research Institute, Bengaluru, Karnataka, India

**Corresponding Author:** MA Naveen, Senior Resident Department of Neurosurgery, Bangalore Medical College and Research Institute, Bengaluru, Karnataka, India, Phone: 9901310162, e-mail: navinmdy@gmail.com

tomography angiogram (CTA) of cervical spine showed a large C2 vertebral body expansile lytic lesion with multiple cystic areas and heterogeneously enhancing prevertebral soft tissue component with abutment of hypoplastic left vertebral artery (Fig. 2).

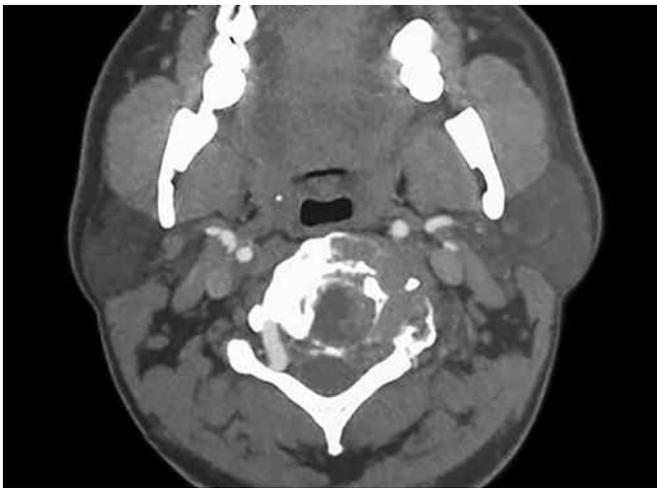
Patient underwent anterolateral approach and decompression of ABC. Peroperatively C2 vertebral body was completely destroyed with multiple hemorrhagic cystic areas. Thecal sac was decompressed anteriorly and fused with iliac crest bone graft. He underwent occipitocervical fusion using contour rods and C2, C3 lateral mass screws (Fig. 3).

Patient's spasticity and neck pain has subsided at 6 months follow-up.

## DISCUSSION

Aneurysmal bone cysts are seen in metaphysis of long bones<sup>1</sup> and 20% in the spine predominantly in the lumbar region. Rarely 1% of these spinal ABCs are seen in cervical

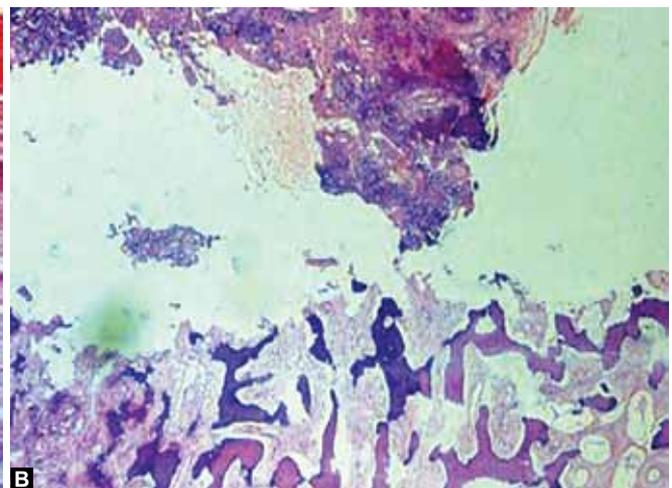
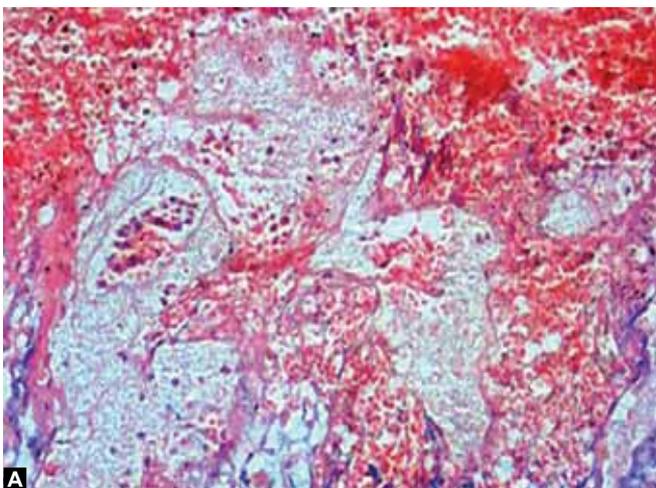
spine as in our case.<sup>2,3</sup> It commonly affects children and adolescents with slightly female preponderance<sup>4</sup> however in our case, the patient is 34-year-old male. Aneurysmal bone cysts in the past were described as ossifying hematomas, subperiosteal hematomas. The definite pathogenesis of this condition is not known. Some propose that the hemorrhagic cysts, subperiosteal hematomas are due to arteriovenous fistulas. Majority of them believe that anatomical changes within the existing bone tumor lead to ABCs, as it is commonly seen to occur in osteoblastomas, osteosarcomas and fibrous dysplasias. Histologically, cyst is blood spaces lined by endothelium along with solid areas of fibrous tissue, osteocytes, hemosiderin histiocytes, extravasated blood and giant cells (Figs 4A and B).<sup>5</sup> Aneurysmal bone cysts on computed tomography (CT) shows expansile cystic mass with rim of calcification and cavities filled with fine trabeculae, lobulated fluid filled spaces. Aneurysmal bone cyst rim on MRI reveal an expansile low signal intensity on both T1 and T2 sequences with varying range



**Fig. 2:** Computed tomography carotid angiography showing expansile lytic lesion with multiple cystic areas involving C2 vertebra



**Fig. 3:** Postoperative CT scan of the cervical spine with 3D reconstruction showing C3, C4 lateral mass and occiput screws with contour rods and plate *in situ*



**Figs 4A and B:** Photomicrograph of low power and high power field showing blood filled lacunae surrounded by spindle cell proliferation and giant cells within the septa

of signal intensity changes of cyst contents due to blood breakdown products.<sup>6</sup> Similar findings were seen in our case which is highly suggestive but not specific of ABC. There are various modalities of treatment for ABCs of the spine, such as surgery, radiation and embolization.<sup>4</sup> Patients with myelopathy require surgical decompression by anterior and posterior approaches followed by fusion to maintain stability. Radiation therapy is used as an adjuvant treatment wherever complete excision is not possible.<sup>7</sup> Only radiation or embolization are acceptable form of treatment if there is no neural compression or instability.

## CONCLUSION

Large ABC of the cervical region with myelopathy require neural decompression followed by combined anterior and posterior stabilization. Cervical ABCs in inaccessible areas require surgical decompression followed by radiotherapy.

## REFERENCES

1. Cybulski GR, Anson J, Gleason T, Homsy MF, Reyes MG. Aneurysmal bone cyst of the thoracic spine: treatment by excision and segmental stabilization with Luque rods. *J Neurosurg* 1989;24(2):273-276.
2. Hay MC, Paterson D, Taylor TK. Aneurysmal bone cysts of the spine. *J Bone Joint Surg B* 1978;60B(3):406-411.
3. Levine AM, Boriani S, Donati D, Campanacci M. Benign tumors of the cervical spine. *Spine* 1992;17(Suppl 10):S399-S406.
4. Mohit AA, Eskridge J, Ellenbogen R, Shaffrey CI. Aneurysmal bone cyst of the atlas: successful treatment through selective arterial embolization: case report. *J Neurosurg* 2004 Oct; 55(4):982.
5. Bret P, Confavreux C, Thouard H, Pialat J. Aneurysmal bone cyst of the cervical spine: report of a case investigated by computed tomographic scanning and treated by a two-stage surgical procedure. *J Neurosurg* 1982;10(1):111-115.
6. Meyers SP, Yaw K, Devaney K. Giant cell tumor of the thoracic spine: MR appearance. *AJNR Am J Neuroradiol* 1994;15(5): 962-964.
7. Seong-Rok Han, Gi-Taek Yee, Han-Seong Kim, Choong-Jin Whang. Aneurysmal bone cyst of a thoracic vertebra. *J Korean Neurosurg Soc* 2005;37(6):459-461.

