Aneurysmal bone cyst of cervical spine: True 360° resection with emphasis on lateral masses

Sir,

Aneurysmal bone cyst (ABC) is an expansile lytic lesion of the bone characterized by multiple blood-filled cavities.[1] About 2% of ABCs are encountered in the cervical spine and generally involve the lamina, pedicles spinous processes and occasionally extending to the facets and vertebral body.[2] Total excision is usually associated with a good outcome but may be difficult to achieve at the cervical spine due to close proximity of neurovascular structures and resultant instability.[1]

A 23-year-old male presented with progressive spastic quadriparesis (bed bound). He was operated elsewhere, with partial excision for similar complaints an year ago. Patient worsened after transient postoperative improvement. Radiology revealed an expansile lytic lesion involving the C3 and C4 vertebral body, lateral masses and the posterior elements, with fluid-blood levels within it, bulging into the spinal canal and compressing the thecal sac. Both vertebral arteries (VA) were engulfed by lesion [Figures 1 and 2], Digital substraction angiography (DSA) revealed multiple tiny thread-like feeders from bilateral V2 segment of VAs and cervical branches of thyrocervical trunk [Figure 3]. Selective angioembolization failed. During surgery initially C3 and C4 corpectomy with superior half of C5 vertebral body was carried out using high speed drill, ensuring normal bony margin at superior (C2) and inferior (C5) end. Bone was soft, vascular and honey combed, which crumpled easily. Tracing the C5 vertebral body laterally, the costotransverse lamellae, the anterior tubercle and then the transverse process was reached. Between the transverse processes, above and below, the vertebral artery was visualised. Careful

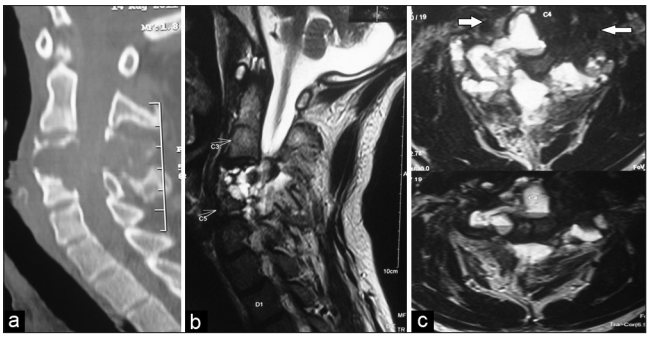

Figure 1: (a) Reconstructed sagittal cervical spine CT scan showing destruction of C3/C4. (b) Sagittal T2W MRI showing involvement of C3/C4 anteriorly and posteriorly with cord compression. (c) Axial MRI T2W images showing expansile bony lesion with multiple blood filled cavities involving vertebral body, lateral masses and posterior elements. Arrow showing engulfed and anteriorly displaced vertebral arteries (Right>left)

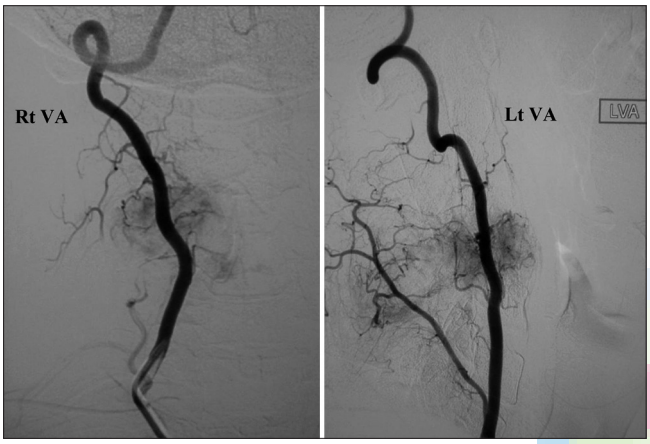

Figure 3: DSA showing right and left vertebral arteries with tumor blush and filling from thyrocervical trunk. Embolization of the feeders did not reduce the tumor blush

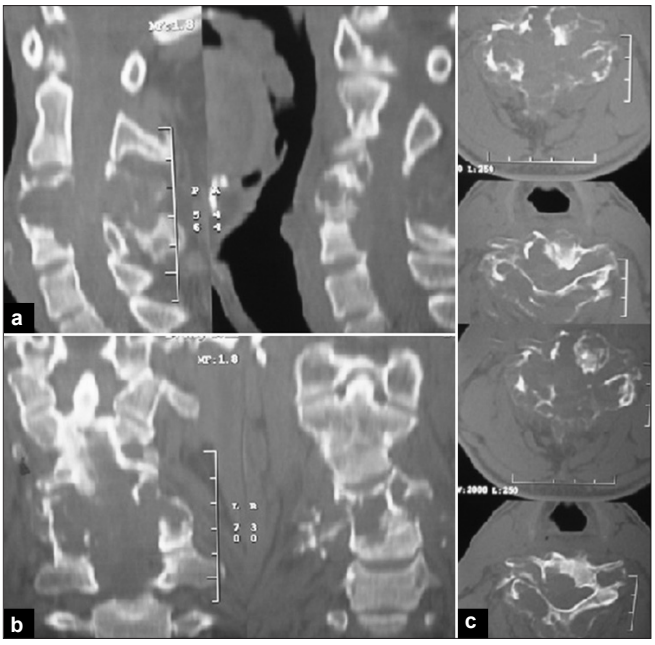

Figure 2: Preoperative CT; reconstructed sagittal (a), coronal (b) and axial (c) images showing expansile bony lesion. (Moth-eaten appearance) involving the C3-C4 vertebral body, lateral masses, lamina and spinous process. The transverse processes and foramina transversarium is also involved

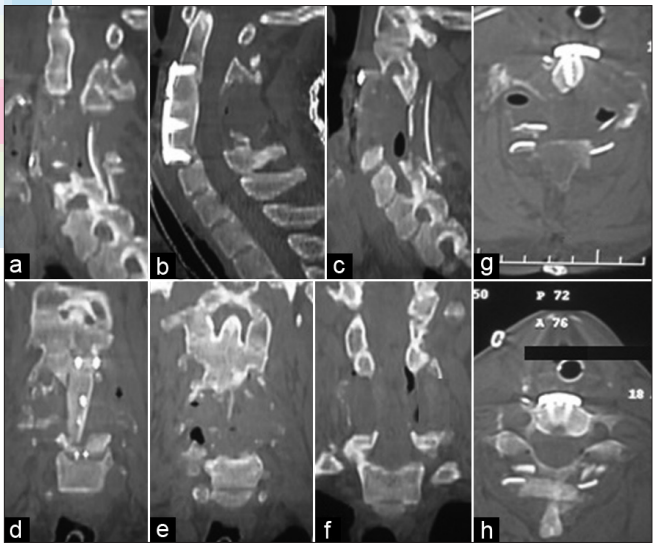

Figure 4: Postoperative CT; Images a-c show sagittal reconstruction from right to left. The parasagittal sections (a and c) removal of facet joints and posterior bone grafts. Image b shows bone graft with plate between C2 and C5. Images d-f show coronal reconstruction from anterior to posterior revealing total vertebrectomy including the lateral masses. Image g and h are axial cuts showing anterior graft, plate and screw with posterior grafts touching the normal bone

removal of the C4 costotransverse lamellae in piecemeal fashion exposed the vertebral artery. Once unroofed, the VA was no longer tethered to the vertebral foramina. Excision was carried laterally upto the nerve root exit on either sides and superiorly upto C2. C2-C5 anterior interbody fusion was done with iliac graft and titanium plate. On posterior approach bilateral C3/C4 lamina and facets were involved by lesion. The involved spinous process and lamina were excised carefully till pedicles and nerve roots exposed completely on posterior aspect. The remaining lateral mass was drilled out completely. Since the VAs were decompressed and pushed anteriorly this could be done by avoiding any inadvertent risk of injuring or yanking them. The VAs were skeletonized completely with nerve roots exposed thereby achieving a complete 360° excision. The posterior instrumentation, in addition, could not be done due to financial constraints and only bone grafts (rib) were placed over decorticated normal bone above and below [Figure 4]. Postoperatively patient was given an external rigid immobilization (halo) for 6 weeks. Histopathological examination confirmed ABC. At 3-month postoperative, patient improved significantly and is ambulatory.

The preoperative diagnosis of ABC is usually made on radiology.[3] Angiogram defines VAs engulfed within the lesion. Besides, the feeding vessels can be embolized if required. Preoperative VA balloon occlusion with clinical and EEG monitoring may be carried out to decide dominant side lest intraoperative injury to occur.[4,5] Total excision is desirable as outcome following that is good.[1] Lesions like ABC usually involve the lateral

masses. Needless to say that it would recur if involved lateral masses are not tackled. Apart from the anterior and posterior decompression and stabilization, true 360° approach requires lateral mass excision. Preservation of VA and neural structures is of utmost importance in this circumferential excision of vertebra. There are case reports mentioning total excision with skeletonization of vertebral artery.[6] However, whether the skeletonization needs to be done anterior or posterior first is debatable. Since the VAs lie more in an anterior plane the anterior approach first is logical. With partial excision the recurrence rates are as high as 30% and as early as few months.[1] This report highlights the importance of aggressive surgical approach for recurrence-free outcome.

Pravin Salunke, Sameer Futane, Vikash Jain[1]

Departments of Neurosurgery and [1]Radiodiagnosis, PGIMER, Chandigarh, India
E-mail: drpravin_salunke@yahoo.co.uk

References

1. Saccomanni B. Aneurysmal bone cyst of spine: A review of literature. Arch Orthop Trauma Surg 2008;128:1145-7.
2. Mankin HJ, Hornicek FJ, Ortiz-Cruz E, Villafuerte J, Gebhardt MC. Aneurysmal bone cyst: A review of 150 patients. J Clin Oncol 2005;23:6756-62.
3. Pennekamp W, Peters S, Schinkel C, Kuhnen C, Nicolas V, Muhr G, *et al*. Aneurysmal bone cyst of the cervical spine (2008:7b). Eur Radiol 2008;18:2356-60.
4. Khalil IM, Alaraj AM, Otrock ZK, Chamoun RB, Sabbagh AS, Skaf GS. Aneurysmal bone cyst of the cervical spine in a child: Case report and review of the surgical role. Surg Neurol 2006;65:298-303.
5. Perlmutter DH, Campbell S, Rubery PT, Vates EG, Silberstein HJ. Aneurysmal bone cyst: Surgical management in the pediatric cervical spine. Spine (Phila Pa 1976) 2009;34:E50-3.
6. de Wald JC. Far lateral approach to the cervical spine in surgical techniques for the spine. In: Haher TR, Merola AA, editors 1st ed. New York: Thieme; 2002. p. 27.

Access this article online	
Quick Response Code:	Website: www.neurologyindia.com
	DOI: 10.4103/0028-3886.93610

Received: 12-10-2011 Review completed: 03-11-2011 Accepted: 06-11-2011