Aneurysmal bone cyst in the cervical spine

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DESCRIPTION

A 7-year-old girl presented to the emergency department with 'clicking' in her neck while trampolining, on a background history of neck pain for a year. There was no obvious history of trauma. Examination of the neck demonstrated a firm mass posteriorly with preserved neck movements and absence of any neurological deficit. In view of her atypical history and clinical examination, plain X-rays were performed which revealed lytic lesions in the body of C2. Detailed imaging was undertaken through CT and MRI. On T2-weighted MRI (*figure 1*), a giant dumbbell-shaped, multiseptated bony lesion involving the body, laminae, and posterior elements of C2 were noted. Multiple fluid-fluid levels were present within the lesion, resembling a giant 'soap bubble'. CT images (*figure 2*) demonstrate the markedly enlarged bony lesion involving C2 with egg-shell thin cortices and increased vascular markings. Appearances were consistent with an aneurysmal bone cyst (ABC) at the C2 level. The child was transferred to the regional paediatric spinal centre where a CT-guided biopsy confirmed ABC and she subsequently underwent curettage of the lesion with autologous bone grafting for spinal stabilisation.

ABCs are rare but benign, highly vascular tumours and account for up to 1% of all bone tumours and 15% of primary spinal tumours.¹⁻⁴ The majority of ABCs occur in the first two decades of life¹⁻⁴ and uncommonly affect the cervical spine, with only 71 cases reported in the literature till recently.¹

Imaging features of ABCs are characteristic and remain key to diagnosis. Plain X-rays may show expansile, well-circumscribed lytic lesions with periosteal calcification ('eggshell-like') and cortical thinning, often described as a 'soap bubble' appearance.⁵⁻⁷ In this case, the MRI findings were also suggestive of a 'soap bubble' appearance (*figure 1*). The typical MRI findings include the presence of

Figure 2 (A) Coronal view of non-contrast CT cervical spine demonstrating the dumbbell-shaped aneurysmal bone cyst of C2 with cortical thinning. (B) Sagittal three-dimensional reconstruction of the cervical spine demonstrating the lytic lesion at C2 associated with increasing vascular markings.

a multiseptated cystic lesion with fluid-fluid levels, hypointense on T1-weighted but hyperintense on T2-weighted images, and contrast-enhancing septal walls.^{3 5-9} Fluid-fluid levels, in particular, are strongly suggestive of an ABC.¹⁰ However, a plethora of other diseases including giant cell tumour, eosinophilic granuloma, fibrous dysplasia, unicameral bone cyst, chondroblastoma, chondrosarcoma, chondromyxoid fibroma, Ewing's tumour and metastatic carcinoma have all been reported to display similar imaging features as an ABC.^{1 4 5} A combination of both radiographs and MRI, alongside histological examination, is required to increase the likelihood of an accurate diagnosis.⁵

Although complete surgical excision of ABCs has been associated with high rates of cure,^{11 12} recurrence, however, remains a concern even after complete excision.^{1 4 7 8 11 13} The risks of aggressive surgery include spinal instability which may necessitate spinal instrumentation and fusion.^{2 3} Perioperative embolisation to aid vascular control has

Figure 1 (A) Midsagittal T2-weighted MRI image demonstrating the extent of the loculated aneurysmal bone cyst (ABC) at C2 without any compression of the neural structures. (B) Axial T2-weighted MRI image demonstrating the multiseptated ABC with fluid-fluid levels with complete involvement of C2.

Learning points

- ▶ Aneurysmal bone cysts (ABCs) of the spine are benign, vascular tumours and account for up to 15% of primary spinal tumours. It is important to investigate thoroughly in cases with atypical presentations, as in this report.
- ▶ Radiological features of ABCs include lytic lesions with periosteal calcification, often described as a 'soap bubble' appearance. MRI findings include a multiseptated lesion with fluid-fluid levels, hyperintense on T2 and hypointense on T1-weighted imaging.
- ▶ Combination of both radiographic and MRI features help clinch the diagnosis although histological examination is often warranted to exclude other, more sinister, lesions.

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also been used as adjuvant therapy.^{1 11} Less aggressive surgical options include curettage¹⁴ while sclerotherapy is also reported to be safe and effective.¹¹

In conclusion, we present the striking images of a giant 'soap bubble' representing an ABC in the cervical spine of a 7-year-old girl. Surgical management was successfully undertaken, and the patient is well at 5-year follow-up.

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