

Transoral Resection of a Symptomatic Pediatric Odontoid Process Aneurysmal Bone Cyst

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Introduction

Aneurysmal bone cysts (ABCs) are benign expansile bone tumors causing local remodeling and destruction. Cervical spine ABCs are relatively rare and typically only involve the posterior elements. In cases with exclusively posterior involvement, instability is typically limited, with percutaneous sclerotherapy/embolization and anti-osteoclastic agents demonstrating benefit. However, in cases where there is cord stenosis and mechanical instability, surgery remains a mainstay of treatment.

We present a 13-year-old female presenting with several months of progressive neck pain that worsened with movement. She did not have any neurologic deficits

MRI cervical spine with contrast demonstrated a 2.3cm x 3.3cm x 2.7cm expansile contrast-enhancing lesion with fluid-fluid levels involving the C2 vertebral body, dens, and bilateral pedicles. The lesion caused moderate cord stenosis without T2 signal change (Figures 1A,B). CT c-spine demonstrated cortical thinning and regions of cortical disruption with bony compromise of the atlantoaxial joint (Figure 1C). The tumor extended to the base of the C2 vertebral body, precluding an extended endonasal odontoidectomy.

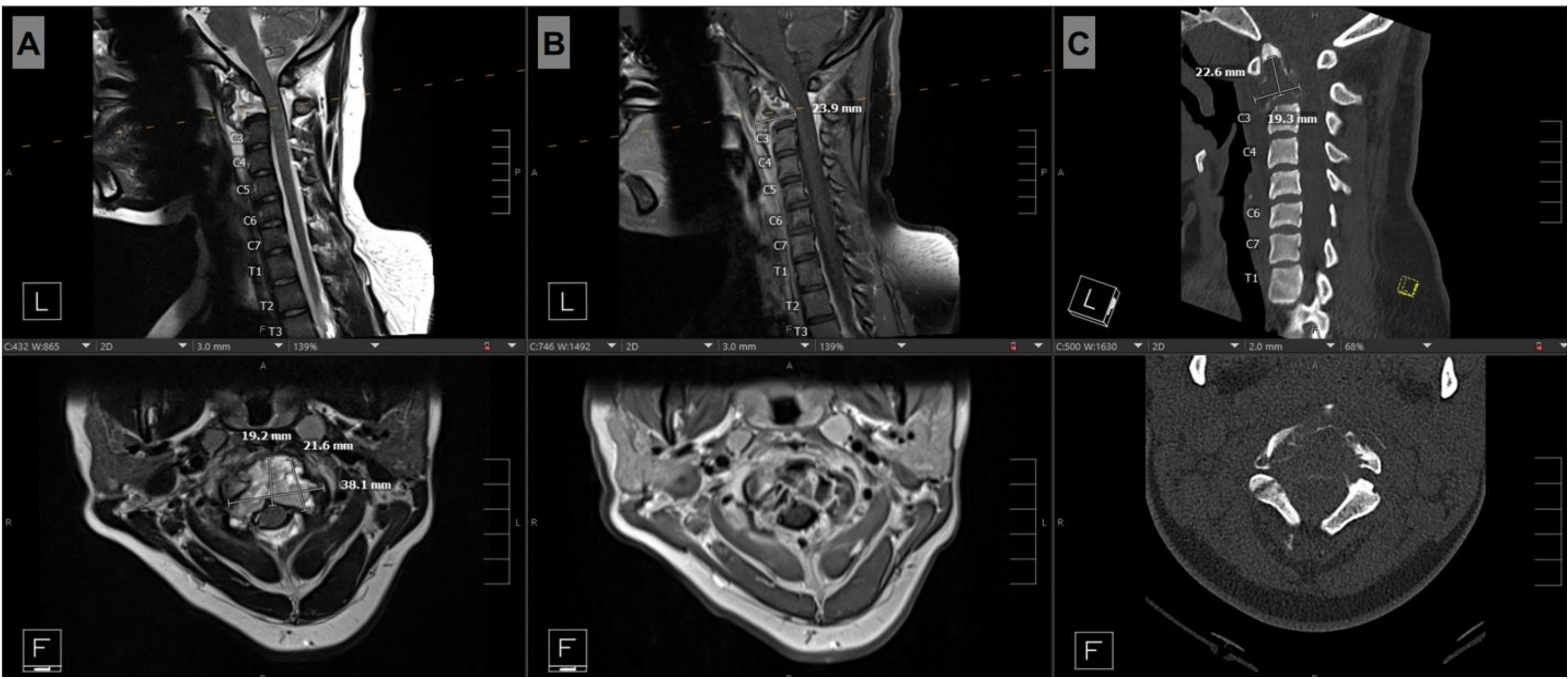


Figure 1. Sagittal/axial MRI and CT images showing cervical spine stenosis from contrast-enhancing, osteolytic C2 lesion.

Methods and Materials

Surgical Approach

- The patient was positioned supine for transoral odontoidectomy
- ENT team performed the approach into the retropharyngeal space, providing access to the C1 anterior arch.
- A high-speed drill was used to decorticate the anterior surface of the odontoid process.
- A fibrous bony lesion was encountered and piecemeal resection was performed using curettes, rongeurs, and high-speed drilling.
- The posterior longitudinal ligament was identified and divided ensuring adequate decompression of the thecal sac.
- The pharyngeal tissues were closed in layers and the patient was repositioned prone, with fluoroscopy confirming alignment
- An occipital-cervical approach was performed
- Residual tumor was resected along the C2 pedicles.
- Occipital plating and lateral mass fixation at C3 and C4 were performed, utilizing an autologous rib graft to aid in fusion.

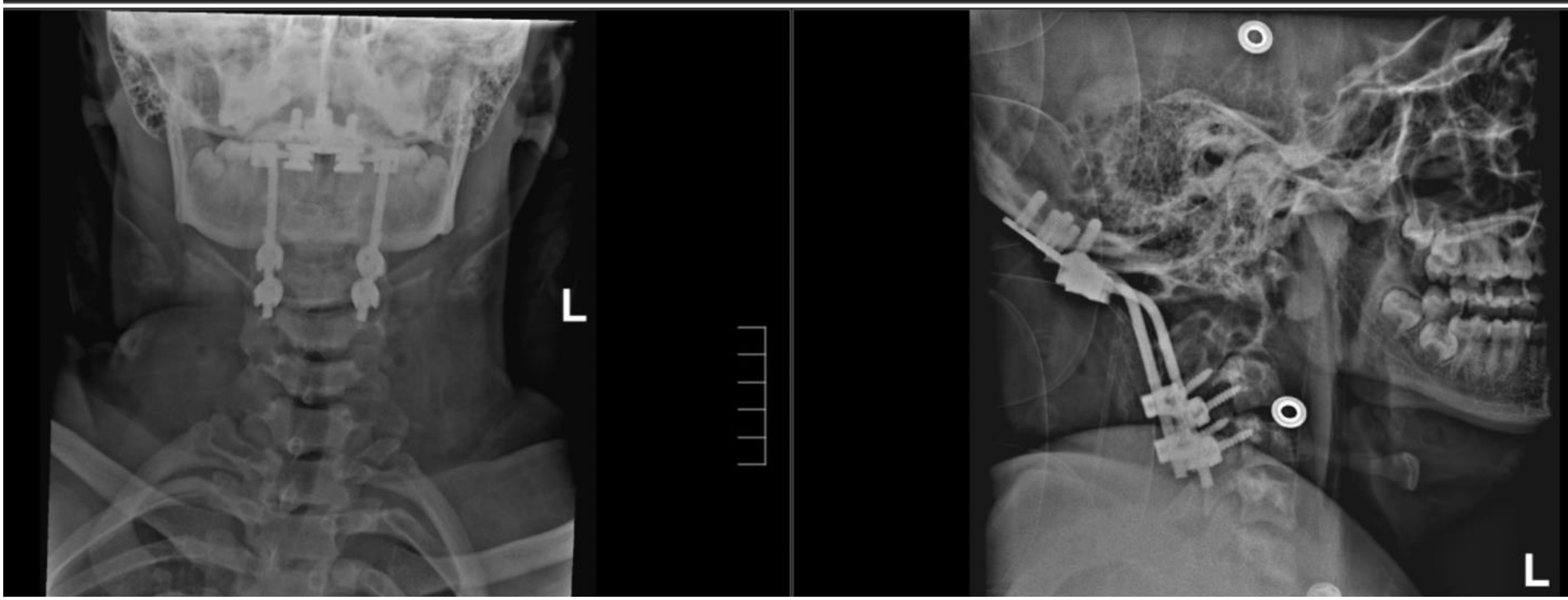


Figure 2. AP/lateral cervical spine x-rays demonstrating appropriate spinal alignment and hardware

Results

Postoperative standing x-rays demonstrated excellent vertebral alignment and hardware placement (Figure 2). Histopathological evaluation of surgical specimens was consistent with an aneurysmal bone cyst.

At two-week follow-up, her neck pain had nearly entirely resolved and she tolerated a regular diet. Post-operative MRI imaging two months after surgery demonstrated resolution of ventral cord compression and post-surgical changes (Figure 3). She remained at her neurological baseline without any pain, weakness, or sensory deficits.



Figure 3. Post-operative sagittal T2 MRI showing resolution of cord stenosis.

Conclusions

Odontoid ABCs can cause cord compression and three-column instability necessitating resection and posterior fixation. Depending on the extent of involvement and angle of approach, transoral approach can provide advantages over standard extended endonasal approach. When mechanical instability is suspected, posterior fixation is critical to preserve spinal alignment and neurologic function.

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