Spinal Intradural Aneurysmal Bone Cyst: A Case Report

Muthana Sartawi[1], Ahmed Quateen[2], Andrew Nataraj[3], Robert Medairos[4]

Key words
- Aneurysmal bone cyst
- Complete surgical resection
- Extraosseous
- Intradural
- Vascular channels

Abbreviations and Acronyms
ABC: Aneurysmal bone Cyst
MRI: Magnetic resonance imaging

From the [1]Department of Orthopedics, Dalhousie University, Nova Scotia, Canada; [2]Mackenzie Health Sciences Centre and [3]Department of Neurosurgery, University of Alberta, Alberta, Canada; and [4]Rush Medical College, Chicago, Illinois, USA

To whom correspondence should be addressed: Muthana Sartawi, BS.c., M.D. [E-mail: sartawi@dal.ca]

Citation: World Neurosurg. (2015) 84, 2:593.e1-593.e5. http://dx.doi.org/10.1016/j.wneu.2015.02.012

Journal homepage: www.WORLDNEUROSURGERY.org

Available online: www.sciencedirect.com

1878-8750/$ - see front matter

INTRODUCTION

Aneurysmal bone cyst (ABC) is an expanding osteolytic benign lesion accounting for approximately 1%–2% of all bone tumors (1). ABCs often occur within the first 2 decades of life, predominately located in the long bones and spine (2). Despite their benign nature, patients with spinal ABCs often present with pain and neurologic deficits caused by local obstruction and invasion into the surrounding tissue (2). To our knowledge, we report the first presentation of an extraosseous ABC involving the intradural extra-medullary spinal canal.

CASE REPORT

A 55-year-old healthy farm worker presented with 4 months of chest and back pain and 3 weeks of progressive leg pain and weakness. There was no numbness or changes in bladder or bowel function. There were no constitutional symptoms and no significant medical history.

On examination, he had grade 4/5 power bilaterally in his hip flexors. His power was otherwise intact, with normal reflexes and rectal tone. Sensory examination was normal except for diminished light touch sensation in the T7 dermatome. Gait analysis was prohibited by pain.

Findings on magnetic resonance imaging (MRI) revealed an enhancing intradural extra-medullary lesion posterior to the T7 vertebral body, with significant spinal cord compression (Figure 1) but without involvement of the adjacent vertebral bodies. The lesion was of heterogeneous hyperintensity both on T1 and T2 imaging and also enhanced heterogeneously after gadolinium administration. We thought there either was hemorrhage or proteinaceous debris within the tumor. No fluid-fluid levels were identified.

Dexamethasone was started, but the patient deteriorated over the subsequent 2 days to having grade 3/5 power in all lower limb myotomes. He was therefore taken for urgent surgery. A midline skin incision was made with exposure of the transverse processes and proximal ribs of T6–T8 on the right. Because of concern regarding tumor adherence to the anterior aspect of the spinal cord and visualization of such, in addition to a laminectomy, resection of the right transverse processes and posterior pedicle of T7 also was performed with disarticulation of the rib head. A 'T'-shaped durotomy was made, with the horizontal aspect of this extending as far laterally as could be closed, given the bony exposure. The dentate ligament and left T7 root were divided. With the lateral bony structures removed, the tumor and lateral aspect of the spinal cord was visualized. The tumor was identified as a fleshy, purple mass, which was friable and non-adherent to the spinal cord. There was no obvious hemorrhage within it. Total excision was attempted, with tumor resection guided by intraoperative ultrasound and electrophysiological monitoring. It had indistinct margins, and we had difficulty assessing the extent of our resection ventromedially. There were several episodes of decreased motor evoked potentials, returning to baseline (which was impaired) after hypertensive therapy and time without tumor manipulation. Because the appearance of the tumor was somewhat unusual for either a meningioma or schwannoma, the ventrolateral extradural space and dura was also inspected after dural closure, without any abnormal appearing tissue found.

Initially postoperatively, the patient's pain improved and his power returned to a grade 4/5. He became ambulatory with a walker (similar to admission, but better than immediately pre-operatively).

Histologically, it was a benign fibro-osseous lesion with compact sheets of spindled cells and foci of newly formed bony trabecular lined by osteoblasts and telangectatic arrays of thin walled vascular channels (Figure 2). There were accompanying zones of recent hemorrhage in different stages of resorption. Clusters of multinucleated giant cells were scattered sporadically in the fibrous matrix. Mitotic figures were not observed. The pathologic diagnosis was an ABC. There were no areas of suspicion of concurrent neoplasm. The lesion was reviewed histologically at another institution (see Acknowledgements) for a second opinion, and corroborated our findings.

At 6 months' follow-up, the patient had minimal pain, and he was neurologically intact and fully ambulatory. At 54 months, he was neurologically intact without significant back pain and was able to participate in full activities. Imaging did not reveal any evidence of recurrent tumor. There was an increase in kyphosis of approximately 15 degrees over the first year of follow-up, but given the

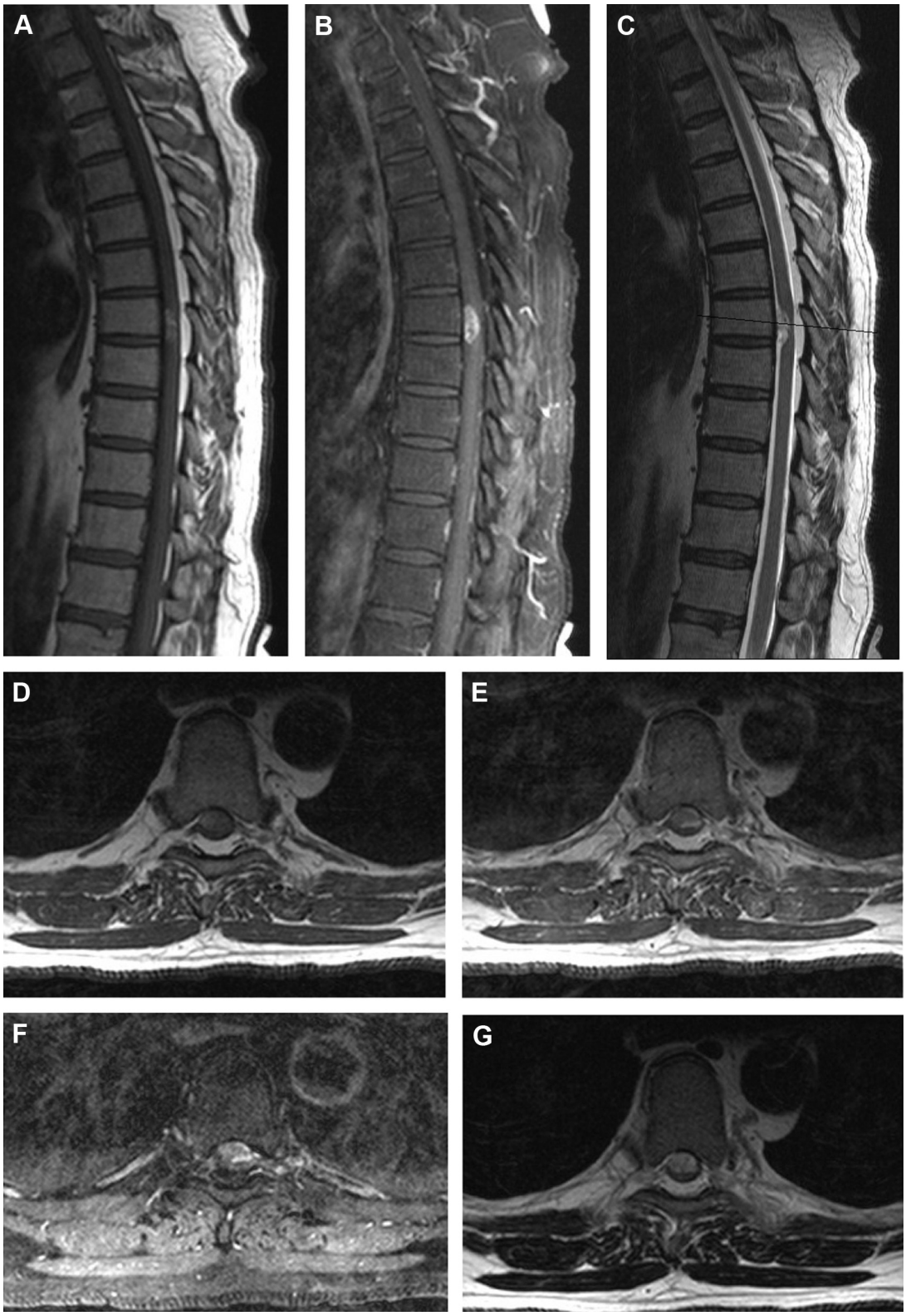

Figure 1. Preoperative magnetic resonance imaging. Posterior to the T7 vertebral body, there is an area of heterogeneous increased T1 and T2 signal seen in intimate association with the anterior aspect of the spinal cord. This lesion demonstrates acute angles with the spinal cord superiorly and inferiorly. It exhibits dense peripheral enhancement, is slightly more centered to the left, and measures 2.0 cm (craniocaudad) by 0.7 cm (anterior-posterior) by 1.2 cm (transverse). The spinal cord at this level measures as little as 34 mm in thickness. However, no convincing cord edema is seen. In (**C**), the line indicates the level from which the preoperative axial sections (**D**–**G**) are taken. T1-weighted sagittal (**A**), T1-weighted post-gadolinium (GAD); (**B**) T2-weighted sagittal (**C**); Axial T1-weighted turbo spin echo (TSE) (**D**) T1-weighted post-GAD; (**E**) T1-weighted fast spin echo (FSE) post-GAD; (**F**) T2-weighted (**G**).