

## Case Report

## Extrasosseous vertebral body haemangioma

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## ABSTRACT

Vertebral body haemangioma (VBH) is a common incidental finding on imaging, occurring in at least 10% of the population. Typical VBH are comprised of endothelial lined vessels and sinuses between vertical longitudinal bony trabeculae. Occasionally these lesions will demonstrate extrasosseous extension resulting in cord or nerve root compression and require active management. Accurate, timely diagnosis is critical particularly given the increased risk of haemorrhage compared with other lesions that occur in this location. These lesions can be rapidly progressive or complicated by a pathological fracture and if diagnosis and treatment is delayed permanent paralysis may result. Both magnetic resonance imaging (MRI) and computed tomography (CT) have independent roles to play in diagnosis, assessment of local complications and preoperative planning to reduce morbidity and mortality. Extrasosseous VBH are more likely to have atypical features on MRI, and in some cases CT will be crucial for diagnosis. An accurate preoperative diagnosis will allow for preoperative angiography in selected cases to both aid surgical planning and for preoperative angioembolisation.

## 1. Case report

A 66 year old woman presented with two days of back pain and three weeks of progressive bilateral lower limb weakness and paraesthesia extending caudally from her waist, worsening gait disturbance and loss of balance. Her past medical history included melanoma and hypertension.

On thoracic spine magnetic resonance imaging (MRI) the T6 vertebral body, pedicles, lamina, spinous and transverse processes were almost entirely replaced by a T2 hyperintense, T1 hypointense, vividly enhancing lesion which extended beyond the confines of the cortex along the right lateral margin of the vertebral body and posteriorly into the spinal canal resulting in severe spinal canal stenosis with compression of the cord and subtle cord signal change. No further abnormal enhancing lesions were demonstrated within the thoracic spine and the remainder of the thoracic spinal canal was capacious (Fig. 1).

Further evaluation with computed tomography (CT) demonstrated the classic appearance of a haemangioma with thickened trabeculae resulting in a prominent striated 'corduroy' pattern on the sagittal images and the classic 'polka dot' pattern of a haemangioma on the axial images with extra vertebral soft tissue extension but no osseous destruction (Fig. 2).

With accurate preoperative diagnosis, appropriate surgical decompression and stabilization could be planned with an awareness of the increased risk of significant haemorrhage associated with extra osseous

vertebral body haemangioma (VBH). A decompression laminectomy, T5-T7 rhizolysis and T4-T8 posterolateral instrumental fusion with bone graft was performed four days following the diagnostic imaging (Figs. 3 and 4).

The patient maintained an American Spinal Injury Association (ASIA) Grade D incomplete spinal cord injury score, in keeping with the myelomalacia demonstrated on MRI, with no progression in the sensory or motor changes following surgery and preservation of bowel and bladder function.

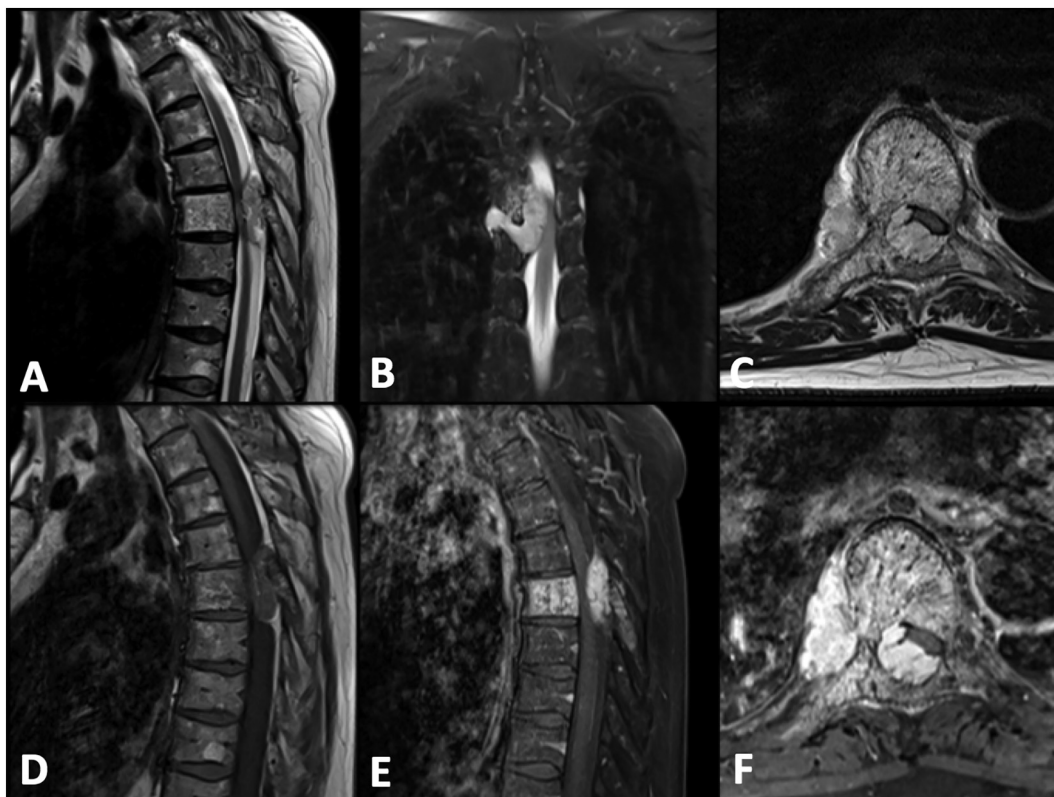
The pathological findings were consistent with haemangioma with extensive vascular spaces of varying size and shape; moderately differentiated endothelial cellular foci, staining positive for ERG a transcription factor expressed in endothelial cells and present in all haemangiomas [1] and CD31 a sensitive and specific endothelial marker, without significant mitotic activity or necrosis. Fragments of bone, soft tissue and elastic ligament present were present within the sections (Fig. 5).

## 2. Discussion

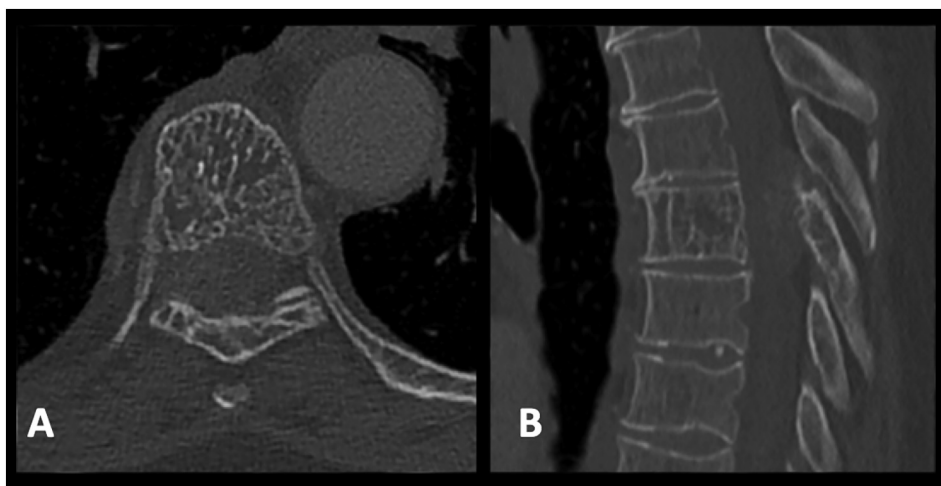
Typically vertebral haemangiomas occur in the thoracic spine, specifically within the vertebral body. However they can occur anywhere within the spine and may be isolated to the posterior elements [2,3]. Intraosseous haemangiomas are common incidental findings on imaging present in at least 10% of the population, indeed figures as

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**Fig. 1.** A: Sagittal T2 weighted image demonstrates T2 hyperintense T6 vertebral body without expansion and a heterogeneous, predominantly T2 hyperintense extradural mass compressing the cord. B: The T2 hyperintensity is more conspicuous on the fat saturated T2 weighted coronal images, as is the extent of the extraosseous tissue into the right facet joint. C: Axial T2 weighted images better delineates the extension of the lesion into the spinal canal with compression of the cord. D: Sagittal T1 weighted MRI clearly shows the extradural location of the soft tissue component compressing the cord. There is subtle heterogeneity in the adjacent T6 vertebral body. E: On the sagittal T1 weighted post contrast images, there is vivid enhancement of both in the intra and extra osseous components. F: This is also clearly demonstrated on the axial T1 post contrast image; which also highlight the degree of cord compression.



**Fig. 2.** A. Axial non contrast CT through the T6 vertebral body demonstrating the classic polka dot appearance of a haemangioma due to resorption of some of the bony trabeculae by the vascular channels and thickening of the remaining trabeculae. Preservation of the normal cortex is seen on both the axial (2.A.) and sagittal (2.B.) images. Extraosseous extension into the spinal canal is again noted with loss of the normal posterior epidural fat plane on the sagittal image (2.B.) however this is better appreciated on MRI.

high as 30% have been quoted in women and in 30% of cases there will be multiple lesions [4]. Rarely these lesions may develop extraosseous components, which, if there is extension into the spinal canal or neural exit foramen, can become symptomatic [2,5,6,7]. Patients may present with radiculopathy or myelopathy from nerve or cord compression respectively. Alternatively they may present with acute back pain from a pathological fracture [7,8].

Unlike intraosseous VBH, which are usually asymptomatic and represent an incidental finding on imaging, atypical VBH with extraosseous extension can follow an aggressive course and active management with angioembolisation, surgical resection, radiotherapy or a

combination of these is often required.

Vertebral body haemangiomas are radiosensitive and radiotherapy has been shown to be effective in the management of symptomatic haemangiomas for the treatment of pain. Complete relief of pain has been reported in over 60%, with doses between 30 and 40Gy and radiotherapy can also improve paraplegia. However the effects are not immediate and it was not employed in this case due to the rapidly progressive nature of the neurological decline necessitating surgical management. Vertebroplasty also has a role in pain management for symptomatic vertebral haemangiomas however was not employed in this case due to the rapid neurological decline and large posterior

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