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A Symptomatic Case of Thoracic Vertebral Hemangioma Causing Lower Limb Spastic Paresis

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

BE 1 Mohammad Alfawareh
B 2 Tariq Alotaibi
E 3 Abdallah Labeeb
F 4 Ziad Audat

1 Department of Orthopedic, Ibn Alhythem Hospital, Amman, Jordan
2 College of Medicine, King Saud University, Riyadh, Saudi Arabia
3 Spine Department, King Fahad Medical City, Riyadh, Saudi Arabia
4 Spine Department, King Abdullah University, Irbid, Jordan

Corresponding Author: Mohammad Alfawareh, e-mail: alfawarehm@yahoo.com
Conflict of interest: None declared

Patient: Male, 18
Final Diagnosis: Hemangioma
Symptoms: Pain • weaknes of lower limbs
Medication: —
Clinical Procedure: Decompression and fixation
Specialty: Neurosurgery

Objective: Unusual clinical course

Background: Despite being the most common tumor of the spine, vertebral hemangioma is rarely symptomatic in adults. In fact, only 0.9–1.2% of all vertebral hemangiomas may be symptomatic. When hemangiomas occur in the thoracic vertebrae, they are more likely to be symptomatic due to the narrow vertebral canal dimensions that mandate more aggressive management prior to the onset of severe neurological sequelae.

Case Report: An 18-year-old male presented to the emergency room with a one-month history of mild to moderate mid-thoracic back pain, radiating to both lower limbs. It was associated with both lower limb weakness and decreased sensation. There was no history of bowel or bladder incontinence. Neurological examination revealed lower limb weakness with power 3/5, exaggerated deep tendon reflexes, bilateral sustained clonus, impaired sensation below the umbilicus, spasticity, and a positive Babinski sign. A CT scan showed a diffuse body lesion at the 8th thoracic vertebra with coarse trabeculations, corduroy appearance, or jail-bar sign. The patient underwent decompression and fixation. Biopsy of permanent samples showed proliferation of blood vessels with dilated spaces and no malignant cells, consistent with hemangioma. Postoperatively, spasticity improved, and the patient regained normal power.

Conclusions: Symptomatic vertebral hemangiomas are rare but should be considered as a differential diagnosis. They can present with severe neurological symptoms. When managed appropriately, patients regain full motor and sensory function. Decompression resulted in quick relief of symptoms, which was followed by an extensive rehabilitation program.

MeSH Keywords: Hemangioma • Muscle Weakness • Spine • Paraplegia

Full-text PDF: http://www.amjcaserep.com/abstract/index/idArt/898562

Background

Hemangioma is a benign tumor that occurs in the endothelial lining of the blood vessels. Bone hemangiomas are benign, malformed vascular lesions, overall constituting fewer than 1% of all primary bone neoplasms.

Despite being the most common tumor of the spine, vertebral hemangioma is rarely symptomatic in adults. In fact, only 0.9–1.2% of all vertebral hemangiomas may be symptomatic [1].The incidence of vertebral hemangioma about 10–12% in the adult population, while the incidence is much lower in pediatric population, with only a few cases reported [1,2].

When hemangiomas occur in the thoracic vertebrae, they are more likely to be symptomatic due to the narrow vertebral canal dimensions that mandate more aggressive management prior to the onset of severe neurological sequelae [3,4]. Hemangioma has three histological types: capillary, cavernous, and mixed. The amount of vascular and fatty tissue might predict the behavior of the lesion [5,6].

We present a rare case of aggressive vertebral hemangioma in the thoracic spine of an 18-year-old male. The diagnosis of vertebral hemangioma is very crucial and can be challenging in some cases. It may mimic malignant lesions in both clinical and radiological behavior [7]. Hemangiomas can be aggressive, compressing the spinal cord with paraparesis and spasticity as in our case.

Hemangiomas require a high index of suspension and knowledge to be diagnosed and managed properly, avoiding complications.

Case Report

An 18-year-old male presented to the emergency room with a one-month history of mild to moderate mid-thoracic back pain, radiating to both lower limbs. It was associated with both lower limb weakness that made him wheelchair bound and decreased sensation. There was no history of bowel or bladder incontinence.

On physical examination, the patient was generally stable. There was mild tenderness at the left costal angle. Neurological examination was normal in both upper limbs. Power was decreased in both lower limbs to grade 3/5. The examination also revealed exaggerated deep tendon reflexes, bilateral sustained clonus, impaired sensations below the T10 level in both lower limbs, bilateral lower limb spasticity, and a positive Babinski sign.

Plain x-ray of the spine showed an osteolytic destructive lesion at the 8th thoracic vertebra with vertical trabeculations,

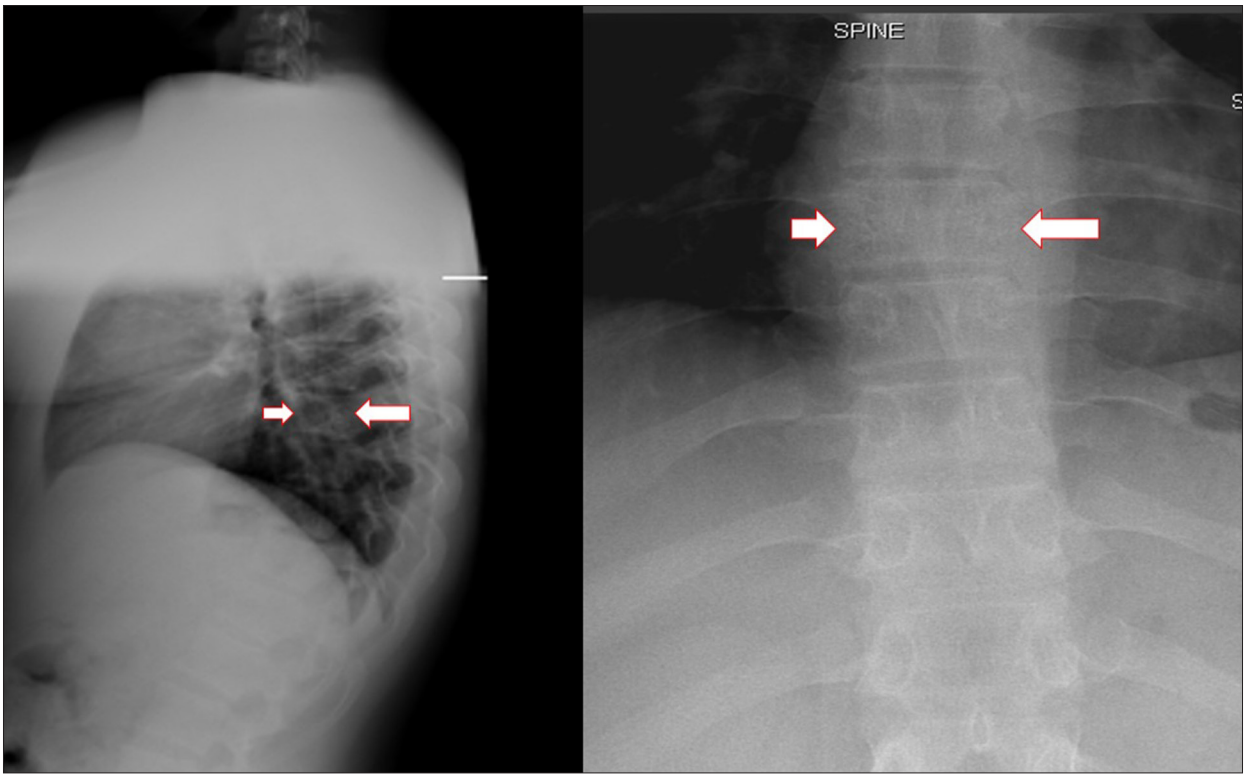

Figure 1. Plain x-ray of the spine showing the jail-bar appearance of the T8.

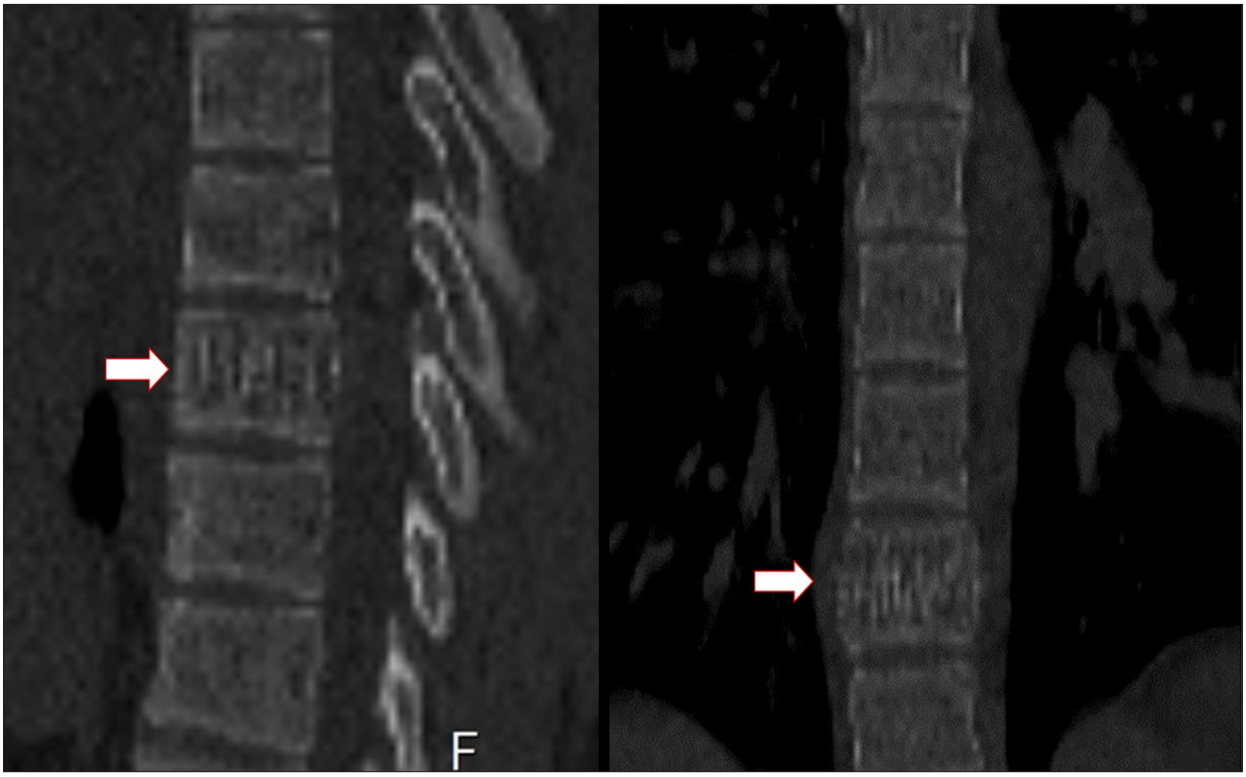

Figure 2. Sagittal and coronal CT scan without contrast showing the T8 lesion. The tumor occupied most of the vertebral body.

jail-bar appearance, and mild right side scoliosis (Figure 1). CT scan showed a diffuse T8 lesion with coarse trabeculations, corduroy cloth appearance, or jail-bar sign (Figures 2, 3). The tumor occupied most of the vertebral body with extension to both pedicles, laminas, and the base of the transverse processes (Figure 3). On the axial cuts, there was expansion of the body and lamina causing spinal stenosis and compromising the neuronal elements; trabeculations were dense and seen as polka dots (Figure 3). Spine MRI showed an extensive high signal intensity body lesion on T2-weighted images (Figure 4) and stained with contrast on T1-weighted images (Figure 4). The tumor mass extended to the neuronal canal, compressing the spinal cord at the same level (Figure 4).

A diagnosis of spinal hemangioma was considered and because of deteriorated neurological status and impending collapse of the vertebra, the patient underwent decompression, biopsy, and segmental fixation utilizing the posterior approach (Figure 5). During the surgery there was profuse blood coming out of the vertebra, and during the decompression there was a soft tissue component with lots of vascular channels that bled easily. Several bone tissue samples were collected and sent for a frozen section and for permanent sections. No definitive diagnosis was revealed from the frozen section. However, permanent biopsy samples showed proliferation of blood vessels with dilated spaces and no malignant cells, consistent with mixed hemangioma.

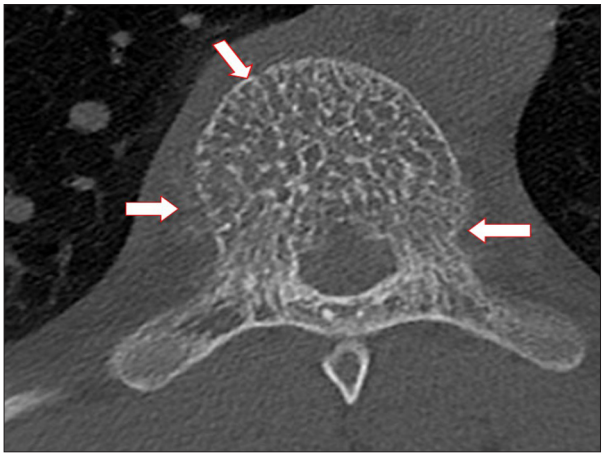

Figure 3. Axial CT scan without contrast showing the T8 lesion with a classical polka dot appearance. The tumor occupied most of the vertebral body with extension to both pedicles and lamina.

The patient had an uneventful postoperative course. Spasticity was improved, and power gradually returned to normal. The patient was discussed in our tumor board meeting, and the oncology team decision was just observation. The patient was referred to a rehabilitation facility and was discharged after 6 weeks of extensive physiotherapy and a near complete recovery. He was able to ambulate independently with minimal weakness and near normal sensations.

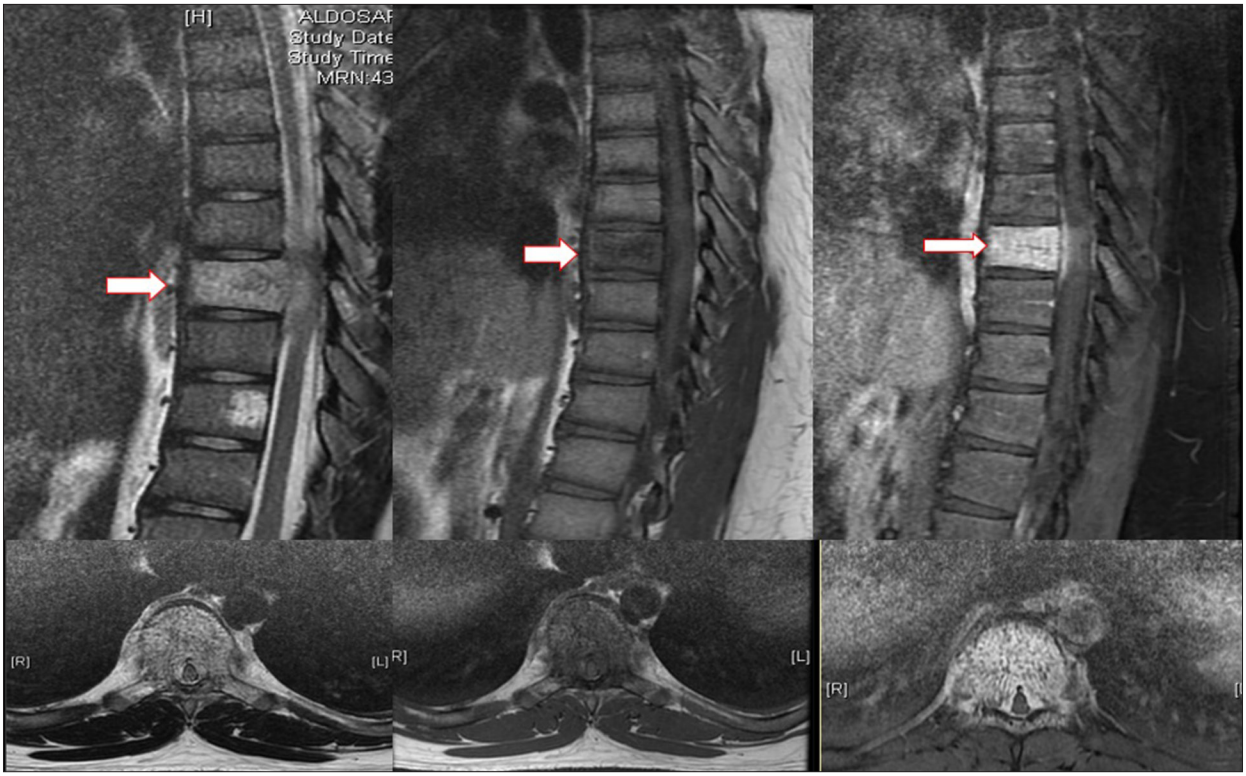

Figure 4. T1-weighted sagittal and axial MRI images pre and post contrast. The T8 high signal intensity lesion was heavily stained with contrast on T1-weighted images.

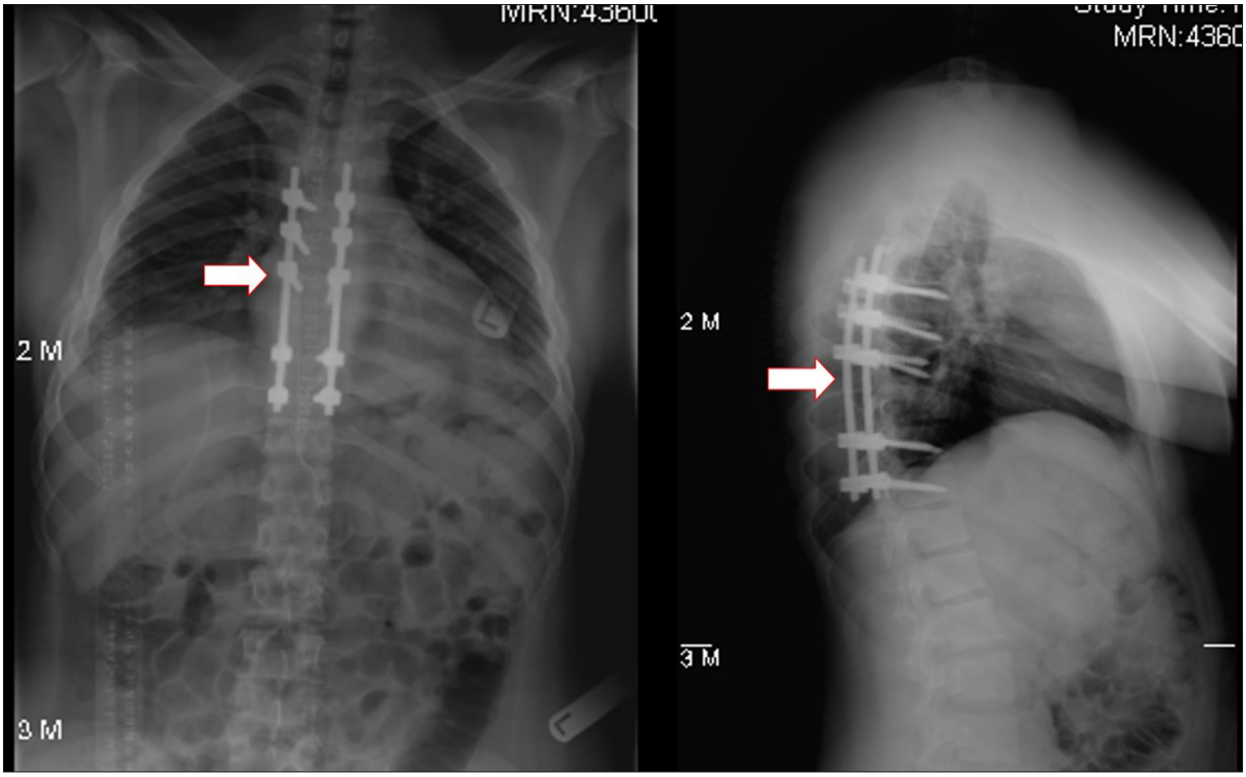

Figure 5. Postoperative plain x-ray.

Discussion

Most vertebral hemangiomas are found incidentally and usually do not require treatment [8]. Symptomatic vertebral hemangiomas are rare in adults, and only a few cases have been reported in children. Back pain is usually the most common presenting symptom [7]. Hemangioma behavior might differ from one patient to another depending on the age, extension of the tumor, and the vascular component. Plain radiographic findings for vertebral hemangiomas consist of coarse vertical striations or a honeycomb pattern. The characteristic MRI appearance of asymptomatic vertebral hemangiomas has a fatty component and fewer vascular stroma. Therefore, they usually have high signal intensity on spin-echo T1- and T2-weighted images, whereas more aggressive lesions usually have hypointensity on T1-weighted images and hyperintensity on T2 images due to prominent hypervascular stroma.

Hemangioma should be differentiated from spine metastatic spine lesions and Paget's disease of the spine. CT scan is usually the gold standard for the diagnosis of vertebral hemangioma. MRI shows the soft tissue component of the lesion, its extension, and amount of compression of the neuronal elements.

With respect to histological pattern, hemangiomas can be capillary, cavernous, and mixed. In bone, the capillary and cavernous types are common.

Spastic paraparesis in our case reflected the behavior of an aggressive hemangioma, which may result in permanent paraplegia and permanent disability if not managed properly. High suspicion, characteristic corduroy appearance on the x-ray, and polka dots on the CT scan usually can enable making the diagnosis.

Treatment options for symptomatic hemangiomas include radiation therapy, embolization, percutaneous sclerotherapy, vertebroplasty, and surgery; and various combinations of these have been used. A treatment algorithm was recommended by some authors. They propose (1) radiotherapy only for small lesions in which vertebral stability is not a concern; (2) kyphoplasty for asymptomatic patients in whom vertebral hemangiomas are small and in patients affected by small vertebral hemangiomas who have pain without spinal canal invasion; and (3) surgery for patients affected by pain without spinal canal invasion but in whom the vertebral hemangioma is wide, patients with spinal canal invasion, and patients affected by neurological deficits [9].

In our case CT and MRI were diagnostic of vertebral hemangioma. Surgical decompression was warranted because of the weakness. The patient recovered after surgery and completion of a rehabilitation program.

Conclusions

Symptomatic vertebral hemangiomas are rare but should be considered as a differential diagnosis. They can present with severe neurological symptoms, but when managed properly, severe disability can be prevented. In our case, decompression and a rehabilitation program resulted in complete recovery.

Statement

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