

# Rare case of vertebral hemangioma causing spinal compression - diagnosis and treatment: Space Occupying Lesion (SOL) study

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## ABSTRACT

**Background.** This case report highlights the importance of accurate diagnosis and treatment for intramedullary spinal cord hemangioma, which is a rare condition that can present with common symptoms of various spinal cord pathologies. The report recommends decompression laminectomy as the appropriate intervention for this condition. This report adds to the existing clinical literature on intramedullary spinal cord hemangioma and can assist clinicians in the diagnosis and treatment of similar cases.

**Case report.** The patient is a 30-year-old female who complained of left leg heaviness, cramps, numbness, and urinary incontinence. MRI revealed a suspected intradural intramedullary lesion, as high as VTh5, suspected to be ependymoma or astrocytoma. The patient underwent decompressive laminectomy on thoracalis vertebra 5-7 and spinal cord mass with hemorrhage and calcification components was observed on post-operative Spinal CT Angiography. The mass was found to have a feeder artery from spinal branches of the left right a. intercostalis at T5 level and spinal branches of the left a. intercostalis at T6 level. Thoracolumbar spondylosis was also observed.

**Conclusion.** The clinical impact of vertebral hemangioma lies in its potential to cause neurological deficits due to spinal cord or nerve root compression. Early diagnosis and treatment through imaging modalities such as MRI and surgical intervention, such as laminectomy, can alleviate symptoms and prevent disability or mortality. However, careful consideration of the patient's clinical history, imaging findings, and neurological status is necessary for accurate diagnosis and appropriate management.

**Keywords:** hemangioma, spinal cord capillary, intramedullary, laminectomy decompression, case report cognitive deficits

## List of abbreviations

CT – Computerized Tomography  
DWI – Diffusion Weighted Imaging  
GCS – Glasgow Coma Scale  
Gd – Gadolinium  
HNP – Herniated Nucleus Pulposus  
IDIM – intra-dural intramedullary

MRI – Magnetic Resonance Imaging  
SOP – Space occupying process  
VC – Vertebrae sacralis  
VL – Vertebrae lumbalis  
VT – Vertebrae thoracal  
Vth5 – Vertebrae thoracal 5

## INTRODUCTION

Capillary hemangiomas are a type of benign vascular tumor that typically occur in the skin or

mucosa of the head and neck, particularly in children. However, they can also occur in other parts of the body, including the vertebral column, where

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they are more commonly found in adult females [1,2].

Although rare, capillary hemangiomas can also occur within the spinal cord. These tumors are often misdiagnosed, as they can mimic other more common spinal cord lesions, such as ependymomas or astrocytomas. However, capillary hemangiomas typically have distinct histological features, including capillary-sized vascular nodules lined by endothelium [3].

In a recent publication [4], the authors presented a case report of a 30-year-old woman with a capillary hemangioma in the spinal cord. The patient had been experiencing cramps in her left leg and had a history of fibromyalgia for 2 years. Imaging studies revealed a spinal cord lesion that was initially suspected to be an ependymoma. However, histological analysis of the tumor following surgical resection confirmed the diagnosis of capillary hemangioma.

The authors noted that while capillary hemangiomas in the spinal cord are rare, they should be considered as a potential diagnosis when evaluating patients with spinal cord lesions. The distinct histological features of these tumors can help differentiate them from other spinal cord lesions, and early recognition can lead to appropriate treatment and better outcomes for patients.

Overall, while capillary hemangiomas are typically benign and have a good prognosis, early recognition and accurate diagnosis are crucial for appropriate treatment and management. Healthcare providers should be aware of the potential for capillary hemangiomas to occur in the spinal cord and con-

sider them in the differential diagnosis of patients with spinal cord lesions.

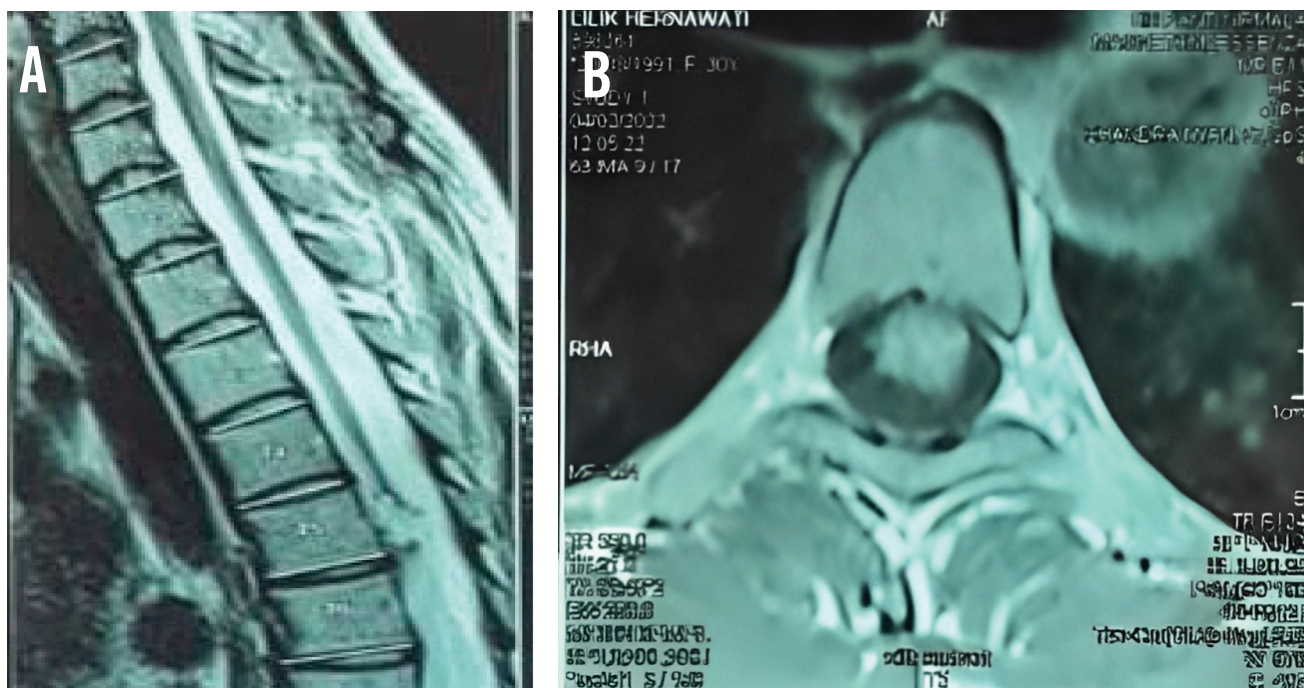
## CASE REPORT

Female patient aged 30 years with complaints of left leg feeling of heaviness and cramps and felt for 3 years, and has been aggravated since the last 2 years in September 2021. The cramps appear especially when getting up from sleep. When walking, the patient's left leg drags on the floor. The patient also complains of numbness and thickness in the left body to the tip of the left foot. The patient also complained that he could not hold his urine for a long time. MRI was performed at the initial diagnosis on February 16, 2022 (Figure 1) "Whole Spine MRI with Contrast at Panti Nirmala Hospital, Malang Indonesia.

There was a heterogeneous hypointense lesion on T1W1, and hyperintense T2W1 and FLAIR, non-restricted on DWI irregular edge impression, intra medulla with a size of  $\pm 0.6 \times 0.8 \times 1.2$  cm to Vth5 suggesting an IDIM Vth 5 susp ependymoma dd astrocytoma tumor".

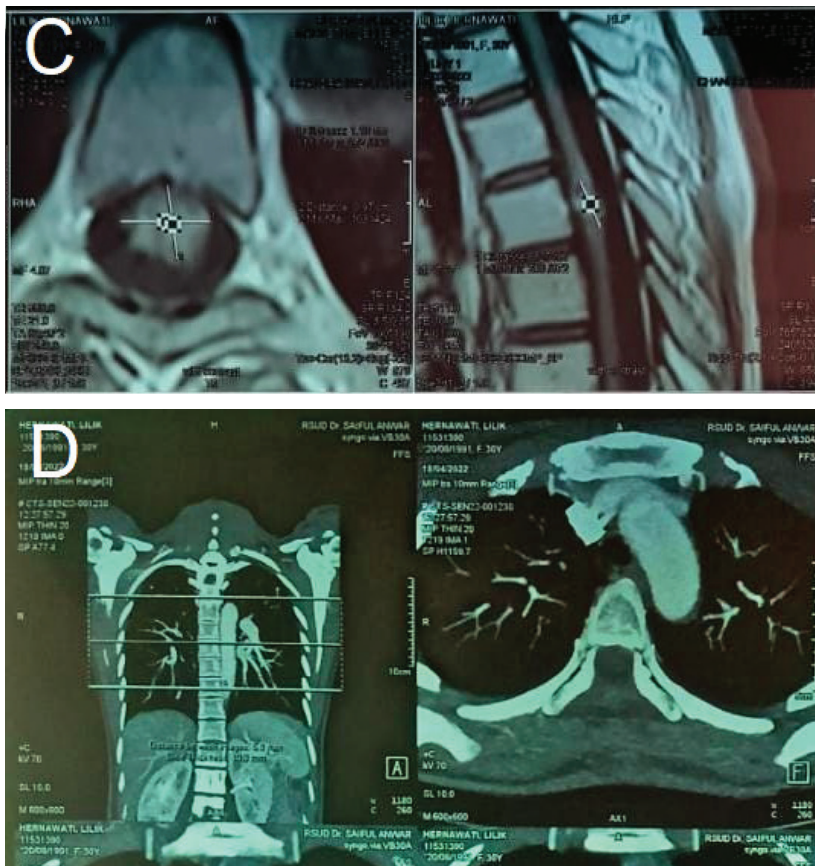
The patient's Glasgow Coma scale (GCS) status was 15/15 (E4V5M6) on admission to the hospital. Several clinical conclusions were found. a) Intradural intramedullary lesion as high as VTh5 suspected Ependymoma Astrocytoma, b), and Canalis mild stenosis) (Mild spinal canal stenosis) VC3-4 VC4-5, VC5-6, VL4-5 and VL5-S1 ec HNP protusion type and c) Intervertebral disc degeneration.

Space occupying process (SOP) Spine at)(thoracic vertebra) vertebra 5. The patient experienced monoparesis inferior S dt susp Spinal Hemangioma and



**FIGURE 1.** A. MRI scan of the spinal region A. right intercostalis left at T5 level; B. spinal branch intercostal artery left at T6 level. Sagittal T2 MRI showing T2 hyperintense lesions at the C7 and T1 vertebral bodies that may be hemangiomas





**FIGURE 2.** C, D. MRI scan of spinal cord Mild canal stenosis VC3-4 VC4-5, VC5-6, VL4-5 and VL5-S1 ec HNP of protusion type

performed decompressive Laminectomy on the thoracic vertebra 5-7. After surgery, Spinal CT Angiography was performed on 21/04/2022 (Figure 2).

Spinal cord mass with hemorrhage and calcification components, impression of getting feeder artery from spinal branches of the left right intercostal artery at T5 level and spinal branches of the left intercostal artery at T6 level and Thoracolumbar spondylolysis

Postoperative lumbar spine MRI indicated L2, L3, and L4 spinal fixation in good position with adequate decompression. Postoperative lumbar spine X-ray is shown in Figure 2.

## DISCUSSION

Vertebral hemangioma is a common clinical disease but has the distinction of malignancy. An invasive hemangioma can compress the spinal cord and lead to decreased neurological function [5]. Intramedullary capillary hemangiomas occur mainly in the thoracic cord (68.4%) and conus medullaris (21.1%), and mostly involve 1 or 2 vertebral segments. Similar to common intramedullary tumors, the clinical symptoms of intramedullary capillary hemangioma are sensory, motor, or sphincter dysfunction, which finally appear in the late stage of lesion development.

Spinal hemangioma can be difficult to diagnose, evaluate, and treat. Its widespread and non-specific manifestation can lead to a delay in diagnosis, increasing the risk of disability and mortality. A favorable prognosis can be ensured through early diagnosis and treatment. MRI provides the most information for spinal hemangioma diagnosis. Medical therapy and surgery are the most effective approach for spinal hemangioma. Surgical treatment is indicated for patients who do not respond to drug therapy or who have progression of the disease or neurological deficits.

Hemangiomas are recognized through CT scans or MRI with lesions generally considered to have radiographic features that distinguish them from intraspinal neoplasms. MRI images help differentiate typical forms from aggressive forms before the appearance of symptoms. Magnetic resonance imaging showed intramedullary capillary hemangiomas to be mostly well-margined, regularly shaped, isointense on T1-weighted images, hyperintense on T2-weighted images, and homogeneously enhanced by Gd administration.

Vertebral hemangioma is a common benign tumor of the spine, often incidentally found on imaging studies. The diagnosis of vertebral hemangioma by CT scan usually shows a circular or polka dot pattern, which is caused by the thin trabeculae and fatty elements within the lesion<sup>5</sup>. However, CT scan has some limitations in the evaluation of vertebral hemangioma, as it is unable to differentiate between active and inactive lesions, and it may miss small lesions.

Laminectomy is a surgical procedure that involves removing part of the vertebral bone, usually the lamina, to relieve pressure on the spinal cord or nerves. It is used as one of the spinal canal decompression procedures in cases such as primary and secondary narrowing like degenerative stenosis, fractures, primary and secondary spinal tumors and abscesses, and deformities. Laminectomy is an effective treatment for symptomatic vertebral hemangiomas with spinal cord or nerve root compression, as it can decompress the spinal canal and alleviate neurological deficits [6].

MRI is the imaging modality of choice for the evaluation of vertebral hemangioma. It usually shows a low-intensity T1 signal and a high-intensity T2 signal, which is explained by the low fat and high vascular components of the lesion. However, the exclusion of more serious pathologies, especially metastatic lesions or malignancy, is recommended, as some ma-

lignant tumors can have similar MRI characteristics to vertebral hemangiomas. It is important to note that hemangiomas almost always originate from the vertebral body and may rarely extend to or originate from the posterior column of the vertebra [7].

Neurological deficits such as paraparesis, pain, gait disturbances, balance difficulties, and bowel and bladder dysfunction are largely due to spinal cord compression. The most frequent symptom is pain. Symptomatic vertebral hemangiomas with spinal cord or nerve root compression are very rarely seen. In cases of symptomatic vertebral hemangioma, treatment options include laminectomy, embolization, or radiation therapy, depending on the size and location of the lesion and the severity of symptoms [6].

In conclusion, vertebral hemangioma is a common benign tumor of the spine that can cause neurological deficits due to spinal cord or nerve root compression. The diagnosis of vertebral hemangioma can be made by CT scan or MRI, but MRI is the imaging modality of choice. Laminectomy is an effective treatment for symptomatic vertebral hemangiomas with spinal cord or nerve root compression, but other treatment options may be considered depending on the size, location of the lesion and the severity of symptoms. However, the diagnosis and management of vertebral hemangioma require careful considera-

tion of the patient's clinical history, imaging findings, and neurological status.

## CONCLUSIONS

Vertebral hemangioma is a common benign tumor of the spine that can cause neurological problems by compressing the spinal cord or nerve roots. The preferred imaging method for diagnosing it is MRI, but CT scans can also be used. Laminectomy is a suitable treatment for patients with symptoms caused by spinal cord or nerve root compression, but other treatments may be considered based on lesion size, location, and symptom severity. Careful evaluation of the patient's medical history, imaging results, and neurological status is crucial in diagnosing and managing vertebral hemangioma.

## Declarations

### *Competing interests*

The authors declare that they have no competing interest.

### *Funding*

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### *Availability of data and materials*

The datasets generated and/or analysed during the current study are available in the Figshare repository, [DOI 10.6084/m9.figshare.22329751

## REFERENCES

1. Wu L, Deng X, Yang C, Xu Y. Intramedullary spinal capillary hemangiomas: clinical features and surgical outcomes: clinical article. *J Neurosurg Spine*. 2013;19(4):477-84. doi: 10.3171/2013.7.SPINE1369.
2. Tunthanathip T, Rattanalert S, Oearsakul T, Kanjanapradit K. Spinal capillary hemangiomas: Two cases reports and review of the literature. *Asian J Neurosurg*. 2017;12(3):556-62. doi: 10.4103/1793-5482.148793.
3. Kasukurthi R, Ray WZ, Blackburn SL, Lusia EA, Santiago P. Intramedullary capillary hemangioma of the thoracic spine: case report and review of the literature. *Rare Tumors*. 2009;1(1):e10. doi: 10.4081/rt.2009.e10.
4. Zhao Z, Zheng J, Zhou Y. Intradural extramedullary capillary hemangioma with intramedullary component: A case series. *Medicine (Baltimore)*. 2022;101(30):e29862. doi: 10.1097/MD.0000000000029862.
5. Hu W, Kan SL, Xu HB, Cao ZG, Zhang XL, Zhu RS. Thoracic aggressive vertebral hemangioma with neurologic deficit: A retrospective cohort study. *Medicine (Baltimore)*. 2018;97(41):e12775. doi: 10.1097/MD.0000000000012775.
6. Jain N, Tadghare J, Patel A, Varma A. Vertebral Hemangioma an Extremely Rare Cause of Spinal Cord Compression in Children: A Case Report. *J Pediatr Neurosci*. 2018;13(4):483-485. doi: 10.4103/JPN.JPN\_59\_18.
7. Konbaz FMS, Al Eissa SI, Alassiri SS, et al. Hemangioma of the Lumbar Spine Involving the Spinous Process: A Rare Case Report and Review of the Literature. *Int J Spine Surg*. 2021;14(s4):S57-S65. doi: 10.14444/7166.