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Case Report

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Thoracic Spinal Cavernous Hemangioma: A Case Report

Rajesh K Ambulgekar[1], Arbaz Akram Khan[2]*, Pradeep Sangnod[3], Amit Yerne[2], Hrishikesh Gaikwad[2], Raunak Ranjan[2]

[1]Professor and Head, Department of Orthopaedics, Dr. Shankarrao Chavan Government Medical College, Vishnupuri, Nanded, Maharashtra, India

[2]Junior Resident-3, Department of Orthopaedics, Dr. Shankarrao Chavan Government Medical College, Vishnupuri, Nanded, Maharashtra, India

[3]Assistant Professor, Department of Orthopaedics, Dr. Shankarrao Chavan Government Medical College, Vishnupuri, Nanded, Maharashtra, India

***Address for Correspondence:** Dr. Arbaz Akram Khan, Junior Resident-3, Department of Orthopaedics, Dr. Shankarrao Chavan Government Medical College, Vishnupuri, Nanded, Maharashtra– 431606, India
E-mail: rbz.khn@gmail.com

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ABSTRACT

Background: Thoracic spinal cavernous hemangiomas are rare vascular lesions that may cause spinal cord compression and neurological deficits. Early diagnosis and appropriate surgical management are important for neurological recovery.

Methods: We report the case of a 23-year-old female who presented three days postpartum with severe low back pain radiating to both lower limbs, paraplegia, and bowel and bladder dysfunction. MRI of the thoracic spine demonstrated a well-defined extramedullary mass measuring 3 × 4.1 × 9 cm extending from T6 to T10, causing severe spinal canal compression. The lesion was surgically excised and subjected to histopathological examination.

Results: MRI showed a T1-hypointense, T2/STIR-hyperintense extramedullary lesion with homogeneous post-contrast enhancement. Intraoperatively, the lesion was adherent to the dura but did not invade the spinal cord and was removed piecemeal. Histopathology confirmed cavernous hemangioma, characterized by large, thin-walled blood-filled vascular spaces lined by endothelial cells. Following surgery, the patient demonstrated significant neurological improvement, with gradual recovery of lower-limb strength and resolution of bowel and bladder dysfunction.

Conclusion: Thoracic spinal cavernous hemangioma should be considered in patients presenting with acute or progressive neurological deficits and spinal cord compression. MRI is essential for diagnosis and surgical planning, while complete surgical resection can provide substantial neurological recovery in symptomatic cases.

Key-words: Thoracic cavernoma; Spinal hemangioma; Spinal cord compression; Magnetic resonance imaging (MRI)

INTRODUCTION

Cavernous hemangioma, also called cavernous angioma, venous malformation, or cavernoma, is a type of vascular malformation resulting from abnormal endothelial development [1]. These lesions may occur in different organs and are characterized by abnormal vascular spaces with slow blood flow [2].

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Cerebral cavernous malformation represents the intracranial form of this condition [3]. Despite the term "hemangioma," cavernous hemangioma does not demonstrate endothelial hyperplasia and is therefore considered a vascular malformation rather than a true neoplasm [4]. Abnormal vascular channels may permit blood leakage into surrounding tissues, resulting in variable clinical manifestations [3,4].

Spinal epidural cavernous hemangiomas are rare lesions. Pure epidural extraosseous lesions may cause neurological symptoms because of spinal cord or nerve-root compression [5]. Preoperative diagnosis can be challenging because these lesions may mimic other spinal epidural masses on imaging [6].

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Clinical presentation may range from back pain and radiculopathy to progressive myelopathy and acute neurological deterioration. Surgical management has generally shown favourable long-term outcomes in symptomatic patients [7]. Clinical series have also demonstrated that appropriate surgical treatment can provide neurological improvement in patients with spinal epidural cavernous hemangiomas [8]. MRI is particularly important for diagnosis because these lesions demonstrate characteristic signal abnormalities and may be misdiagnosed with other epidural lesions [9]. MRI also assists in preoperative evaluation and surgical planning [10]. Surgical excision is the preferred treatment for symptomatic lesions producing neurological compression and has been associated with favourable outcomes [11]. We present a rare case of a thoracic spinal cavernous hemangioma presenting with acute paraplegia in a patient who was three days postpartum.

CASE PRESENTATION

A 23-year-old female patient presented with severe low back pain radiating to both lower limbs, associated with paraplegia. The patient was three days postpartum at the time of presentation. She denied any recent trauma or significant previous medical history.

On physical examination, there was weakness of both lower extremities, with muscle power graded 0/5. The patient had paraplegia with bowel and bladder involvement and difficulty with urination. Sensory examination revealed decreased sensation to light touch and pinprick in the lower extremities below the groin. Upper-limb strength and sensation were intact, and cranial nerve examination was unremarkable.

Thoracic spinal MRI revealed a well-defined, solid extramedullary mass lesion measuring 3 × 4.1 × 9 cm (AP × TR × CC). The lesion was located in the spinal canal on the right side and extended from T6 to the superior border of T10**,** producing severe narrowing of the spinal canal and displacement of the spinal cord. It was hypointense on T1-weighted images, heterogeneously hyperintense on T2-weighted and STIR images, and showed homogeneous post-contrast enhancement (Fig. 1).

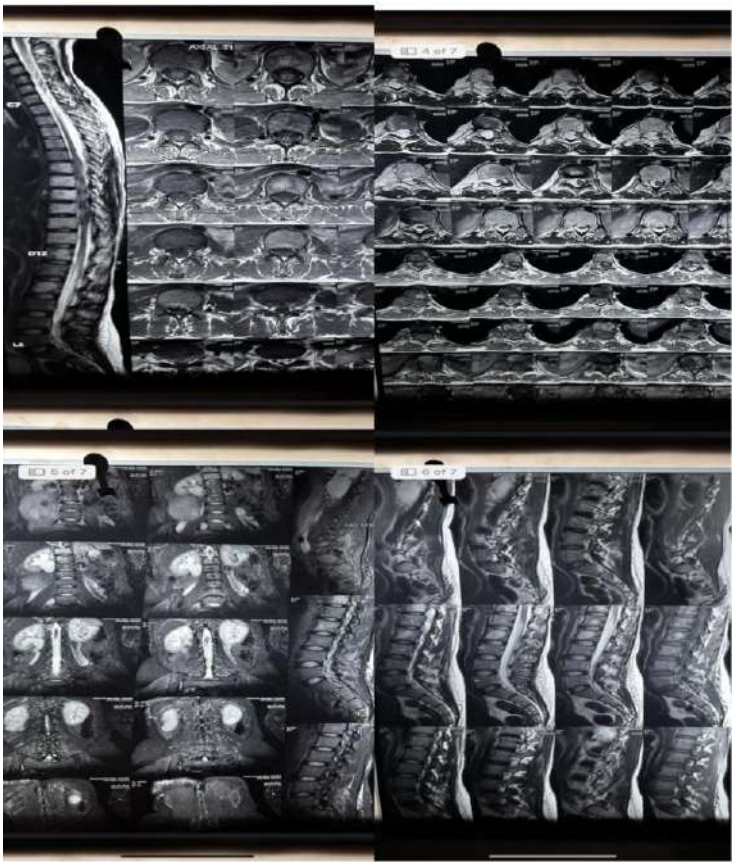

Fig. 1: Thoracic spinal MRI showing a well-defined, solid, extramedullary mass lesion at T6–T10 levels, compressing and displacing the spinal cord

The patient was diagnosed with a mass-occupying lesion and was counselled and prepared for surgical resection. Intraoperatively, the lesion was adherent to the dura but had not invaded the spinal cord. Macroscopically, the tumor had a smooth capsule with dural attachment. It was gently separated from the cord without damaging the dura and was removed piecemeal.

Histopathological examination confirmed cavernous hemangioma. The lesion was characterized by large, thin-walled vascular spaces filled with blood and lined by a single layer of endothelial cells (Fig. 2). The surrounding stroma exhibited fibrous tissue with an inflammatory response.

Postoperatively, the patient was assessed on day 1 and day 15. Significant neurological improvement was observed, with gradual recovery of lower-extremity strength and resolution of bowel and bladder dysfunction.

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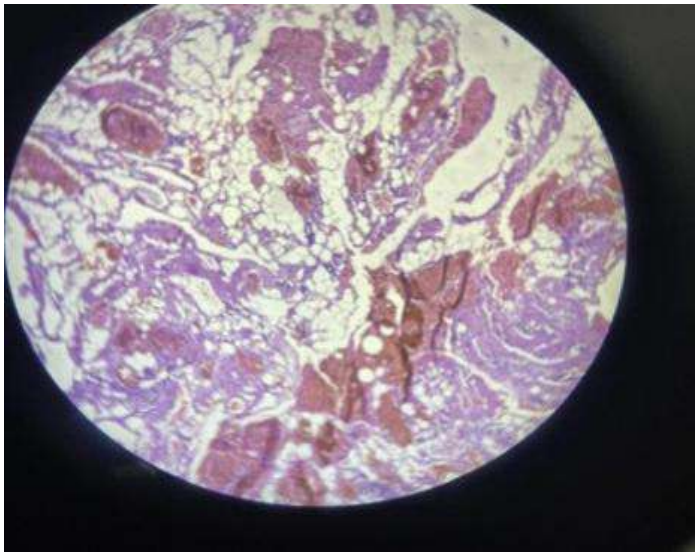

Fig. 2: Histopathology showing large, thin-walled vascular spaces filled with blood, lined by a single layer of endothelial cells (H&E stain).

DISCUSSION

Cavernous hemangiomas are benign vascular lesions characterized by large, blood-filled vascular spaces lined by endothelial cells and are generally slow-growing [1,3]. They may occur in several anatomical locations, including the skin, liver, brain, and other organs [2]. Spinal epidural cavernous hemangiomas are rare, accounting for approximately 4% of spinal epidural tumors and 1–2% of all cavernous hemangiomas [5,6]. Although generally benign, their location within the spinal canal can result in significant neurological compromise because of compression of the spinal cord or nerve roots.

The histopathological findings in the present case were consistent with cavernous hemangioma, showing large, dilated vascular spaces lined by flattened endothelial cells with fibrous and inflammatory tissue in the surrounding stroma [3,9]. These lesions are typically well circumscribed, although their vascular channels may vary in size and contain red blood cells. Immunohistochemical evaluation may demonstrate endothelial markers such as CD31 and factor VIII-related antigen [4,10]. Recent molecular studies have identified somatic MAP3K3 variants as potential drivers of cerebral and spinal cord cavernous malformations [13]. The clinical significance of somatic PIK3CA and MAP3K3 mutations has also been demonstrated in cerebral and spinal cavernous malformations [14].

Clinically, cavernous hemangiomas may remain asymptomatic; however, symptoms may develop when the lesion compresses adjacent structures. Spinal epidural cavernous hemangiomas typically present with back pain, radiculopathy, progressive myelopathy, or acute neurological deterioration, including paraplegia [5,6,15]. In the present case, the patient presented with severe neurological impairment, including paraplegia and bowel and bladder involvement, associated with a large thoracic extramedullary lesion.

The postpartum presentation is an important feature of the present case. Pregnancy-related hormonal and haemodynamic changes may contribute to enlargement or symptomatic presentation of epidural cavernous hemangiomas [16]. The patient in our case developed acute neurological symptoms only three days after delivery, making the temporal relationship clinically noteworthy. However, the exact mechanism by which the postpartum state contributes to symptomatic presentation remains uncertain.

MRI is the preferred imaging modality for evaluating spinal epidural cavernous hemangiomas. These lesions generally demonstrate low or isointense signal on T1-weighted images and high signal intensity on T2-weighted images, with contrast enhancement [5,6,9]. In the present case, MRI demonstrated a well-defined extramedullary lesion extending from T6 to T10, with T1 hypointensity, heterogeneous T2/STIR hyperintensity, homogeneous post-contrast enhancement, and severe spinal canal narrowing with spinal cord displacement. Despite these characteristic findings, spinal epidural cavernous hemangiomas may mimic other epidural lesions, making preoperative diagnosis challenging [6,9]. Careful radiological evaluation is therefore important for defining the extent of the lesion and planning surgical treatment [10].

For symptomatic spinal epidural cavernous hemangiomas producing neurological compression, surgical resection is the treatment of choice [7,8,11,12]. Early surgical intervention may provide favourable neurological recovery, particularly when significant spinal cord compression is present. Because of their vascular nature and adherence to surrounding structures, complete en bloc removal may not always be possible, and piecemeal resection may be required [7]. Preoperative embolization may be considered in selected cases to reduce intraoperative bleeding [11]. In the present case, the lesion was adherent to the dura but had not invaded the spinal cord and was carefully

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separated and removed piecemeal. The patient subsequently demonstrated significant neurological improvement, with gradual recovery of lower-extremity strength and resolution of bowel and bladder dysfunction.

The prognosis of spinal epidural cavernous hemangiomas is generally favourable following appropriate surgical management [7,8]. However, delayed diagnosis or progressive compression may result in severe and potentially irreversible neurological deficits. The present case therefore emphasizes the importance of considering spinal epidural cavernous hemangioma in the differential diagnosis of an extramedullary thoracic lesion presenting with acute neurological deterioration, particularly in an unusual postpartum setting. Early recognition, appropriate MRI evaluation, and timely surgical decompression can provide substantial neurological recovery.

CONCLUSIONS

Thoracic spinal epidural cavernous hemangioma is a rare vascular lesion that may present with acute and severe neurological deficits, including paraplegia. MRI plays a crucial role in identifying the lesion, defining its extent, and assessing spinal cord compression. Histopathological examination confirms the diagnosis. Early surgical excision and adequate spinal cord decompression can provide significant neurological recovery, even in patients presenting with severe preoperative deficits. This case also highlights the unusual postpartum presentation and emphasizes the need to consider spinal cavernous hemangioma in the differential diagnosis of thoracic extramedullary lesions with acute neurological deterioration.

CONTRIBUTION OF AUTHORS

Research concept – Rajesh K Ambulgekar, Arbaz Akram Khan
Research design – Rajesh K Ambulgekar, Arbaz Akram Khan, Pradeep Sangnod
Supervision – Rajesh K Ambulgekar
Materials – Arbaz Akram Khan, Amit Yerne, Hrishikesh Gaikwad, Raunak Ranjan
Data collection – Arbaz Akram Khan, Amit Yerne, Hrishikesh Gaikwad, Raunak Ranjan
Data analysis and interpretation – Arbaz Akram Khan, Pradeep Sangnod
Literature search – Arbaz Akram Khan, Amit Yerne, Hrishikesh Gaikwad, Raunak Ranjan
Writing article – Arbaz Akram Khan
Critical review – Rajesh K Ambulgekar
Article editing – Rajesh K Ambulgekar, Pradeep Sangnod
Final approval – Rajesh K Ambulgekar

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