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Case Report

Thoracic spine schwannoma presenting with traumatic spinal cord injury: A case report

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ABSTRACT

Background: The presentation of a thoracic spinal tumor due to high-impact trauma is quite rare and we found no other case reported.

Case Description: This is a case report and literature review. A patient presented with severe paraparesis on day 4 after trauma. Thoracic MRI showed an oval image centered to T4-T5 suggestive of hemorrhage. The patient underwent a bilateral T4 and T5 laminectomy and microsurgically assisted intradural exploration. After laminectomy, we found no extradural lesions, so we proceeded to dural opening, after which we found a large extramedullary lesion which was completely removed. Pathology revealed a schwannoma. The patient had a very good recovery after surgery and motor rehabilitation. At 6 months after surgery, inferior limbs muscle strength was completely normal. We found no other case reported.

Conclusion: Thoracic spine schwannomas are difficult to early diagnose unless there is a clinical suspicion. Initial presentation as bleeding after trauma was not described before. This presentation should be kept in the differential diagnosis of any patient with an acute neurological deficit without trauma signs on admission imaging.

Keywords: Spine cord injury, Spine trauma, Spine tumor, Thoracic spine schwannoma, Tumor bleeding

INTRODUCTION

Spinal schwannomas are the most common intradural extramedullary spinal tumors, representing up to one-third of these lesions.[11] They are far more frequently seen in the cervical and lumbar regions than in the thoracic spine. Whereas pain is the most common presentation, sensory deficit can occur in the affected root distribution, due to the tumor originating in dorsal sensory roots.[1,12] Long tract signs or overt myelopathy can develop in larger lesions, their growth rate also playing a role in such cases, with faster growth related to more profound deficits early in the course of disease.[7,8] The vast majority of spinal schwannomas are solitary and have no association with inherited mutations.[1,5,11,13]

The following is a rare case of an intradural nerve sheath schwannoma presenting with motor weakness after trauma.

CLINICAL PRESENTATION

A young male patient, with no significant previous medical history, was admitted to the emergency room after a 6 m high roof fall, with right-sided limb trauma and left inferior

limb motor weakness. The patient had acute right inferior limb pain and was unable to walk unaided. Neurological examination disclosed mild (Grade 4/5) weakness of the left thigh extension and a very painful active and passive mobilization of the right-sided limbs. He also had bilateral inferior limb numbness, American Spinal Injury Association Score D.

A thoracolumbar spine CT scan was performed and showed no traumatic lesions. A trochanteric right femur and right olecranon fractures were diagnosed and treated. The patient was then admitted to the orthopedics unit. At day 4 after trauma, the patient developed severe paraparesis (Grade 1/5), American Spinal Injury Association Score C, with D9 sensory level and urinary retention. Dorsal and lumbar spine magnetic resonance was immediately performed and showed an oval shaped image centered to D4-D5, compressing the spinal cord, with surrounding edema [Figures 1-4]. This image showed no differences when intravenous contrast was given and was hyperintense on both T1- and T2-weighted images. It was suggested to be a hemorrhage, a hypothesis further supported by the presence of blood deposits in the conus medullaris region.

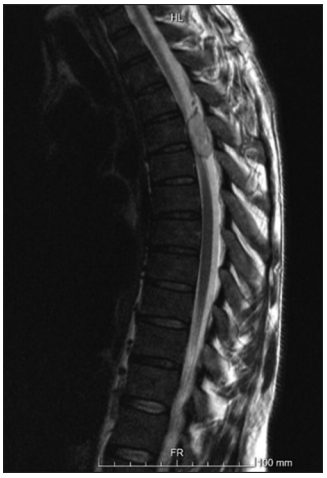

Figure 1: T2-weighted sagittal thoracic spine MRI revealing an oval-shaped lesion compressing the spinal cord.

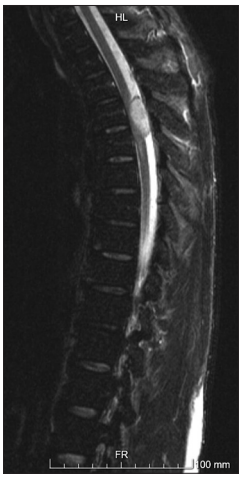

Figure 2: Sagital T2-weighted MRI revealing the oval-shaped lesion at T4-T5.

Operative findings

The patient underwent T4-T5 bilateral laminectomy under radiological control. We found no extradural lesions and so we proceeded to dural opening. As soon as the duramater was fully opened, we found a large reddish-grayish firm mass with approximately 2 cm in diameter, with a thin surrounding blood clot. The tumor, which had clear limits, was carefully dissected [Figures 5 and 6]. By separating the lesion from the ventrally compressed medulla, we had to sacrifice one dorsal root that was dispersed itself in the tumor. An *en bloc* removal was achieved without any medullary manipulation.

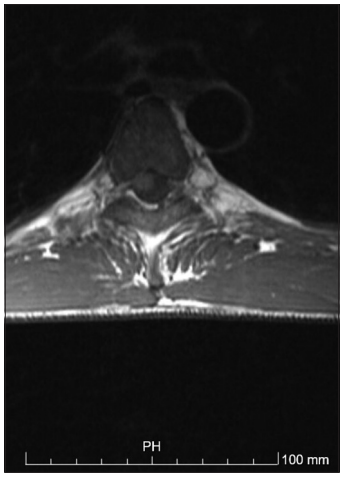

Figure 3: Non-contrasted T1 MRI showing spinal cord compression and anterolateral displacement.

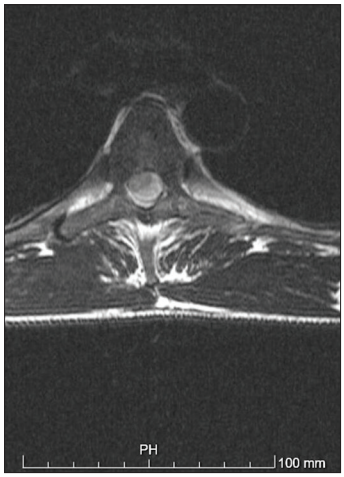

Figure 4: T2-weighted axial thoracic spine MRI.

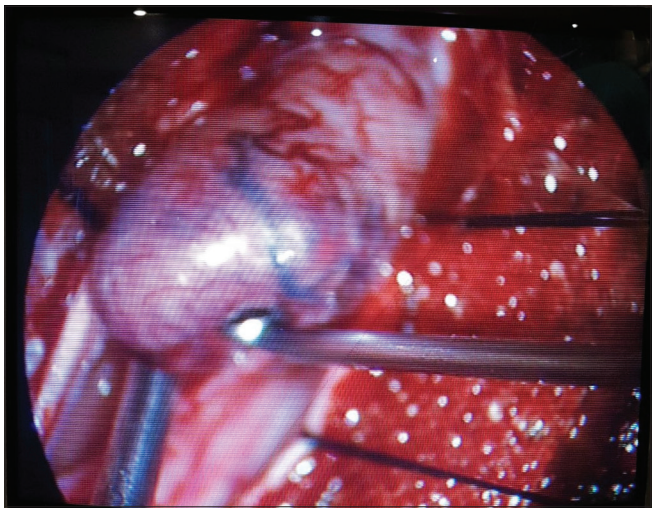

Figure 5: Microscope-assisted intraoperative image of the lesion.

Figure 6: Image of the schwannoma right immediately after excision.

Histology

Received in formalin, the surgical piece consisted of a grayish, nodular lesion with 2.8 × 1.5 × 1.6 cm in diameters [Figure 7]. It had a smooth and shinning capsule and when sectioned was composed of a translucent brownish soft tissue.

Histology revealed a benign nerve sheath tumor surrounded by a thin capsule of dense connective tissue with a variable cellular density. It showed predominant areas of elongated eosinophilic cytoplasm cells originating parallel or crossed bundles (Antoni A type areas) with some minor less cellular areas of loose tissue and microcysts. These cells had rounded nuclei and undefined cytoplasm (Antoni B type areas). The tumor vessels had thick and hyalinized walls and, in some areas, these vessels were agglomerated and dilated with an angiomatous aspect. There were focal intra and extracellular deposits of hemosiderin with areas of recent hemorrhage. The tumor was diffusely positive for S100 protein.

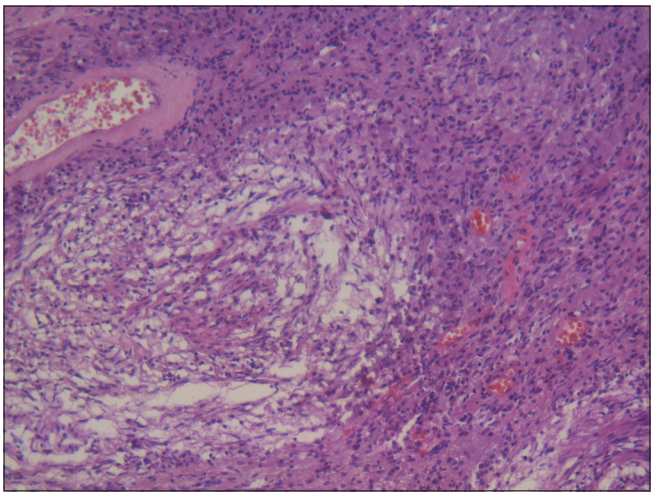

Figure 7: H and E ×200, Antoni B fibers with signs of hemorrhage.

Postoperative outcomes

The patient showed neurological improvement immediately after surgery, with better mobilization of the left inferior limb (Grade 3/5). The right inferior limb was still limited by the trochanteric fracture, but also showed increased muscular strength in the right foot (Grade 4/5). Urinary sphincter dysfunction resolved within 1 month.

A thoracic spine MRI postsurgery showed total lesion removal and did not demonstrate any other lesions. Two months later, the patient could walk unassisted. On further follow-up, the patient totally recovered muscular strength, ASIA score E. At 1.5 years follow–up, the patient remains with American Spinal Injury Association Score E.

DISCUSSION

To the best of our knowledge, this is the first reported case of thoracic spinal schwannoma presenting days after high-impact trauma.[6,10] Despite having such a large intradural extramedullary tumor,, this patient had never felt any dorsal pain or inferior limb complaints before trauma. Because thoracic schwannomas are benign, slow-growing lesions, they are frequently undiagnosed until compression caused by the tumor in the spinal cord causes inferior limb motor weakness. As in any case of spinal cord compression lesion, spinal trauma may exacerbate this compression allowing its early detection but also potentially causing severe neurological deficit.[2,4,5]

In hindsight, regarding the left inferior limb motor weakness, the patient developed after trauma, a thoracolumbar MRI should have been done earlier, as the initial thoracolumbar

CT showed no signs of spinal trauma and the neurological deficit was already present. Probably, the initial spinal cord insult and the following increasing edema were the cause of this paraparesis and subsequent neurological worsening. Once established, decompression was needed, and it was achieved by tumor removal. This procedure and a short period of anti-edema therapy resulted in a very good outcome.

The blood deposits found in the conus medullaris area and inside the tumor could have been explained by the trauma insult to the tumor itself causing its vessels to rupture and bleed. An alternative explanation is the stress that this patient was submitted to, not only by the trauma but also by the following hospitalization and treatments, could have sensitized the tumor and causing it to bleed the following days after the trauma, which would also justify the surrounding edema and the absence of bleeding signals in the initial CT scan.

Probably, the high-impact trauma caused spinal cord and tumoral insults, both resulting in tumor bleeding and surrounding edema leading to paraparesis.[13] Regardless of the mechanism involved, early decompressive surgery was the treatment of choice, with an excellent result.

CONCLUSION

Thoracic spine schwannomas, as other preexisting space-occupying lesions, should be kept in mind as a differential diagnosis of acute spinal trauma patients with paraparesis and without bony traumatic lesions. Although the underlying mechanism may not be clear, we report a case of a previously healthy patient with severe paraparesis after trauma in relation with a thoracic spine schwannoma with hemorrhage. After surgery, this patient had a great recovery having normal inferior limbs muscular strength after 2 months.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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