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Technical Notes

Illustrative resection of mixed intra- and extramedullary thoracic spinal cord capillary hemangioma

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ABSTRACT

Background: Capillary hemangiomas are typically superficial benign tumors of the cutaneous and mucosal tissues of the face and neck in pediatric patients. In adults, they typically occur in middle-aged males who present with pain, myelopathy, radiculopathy, paresthesias, and bowel/bladder dysfunction. The optimal treatment for intramedullary spinal cord capillary hemangiomas is gross total/*en bloc* resection.

Methods: Here, we present a 63-year-old male with increasing right greater than left lower extremity numbness/weakness, attributed to a T8-9 mixed intra- and extramedullary capillary hemangioma.

Results: One year following complete lesion resection, the patient used an assistive device to ambulate and continued to improve neurologically.

Conclusion: We presented a 63-year-old male whose paraparesis was attributed to a T8-9 mixed intra- and extramedullary capillary hemangioma who did well following total *en bloc* lesion resection. In addition to this case study/technical note, we provide a 2-D intraoperative video detailing the resection technique.

Keywords: Intradural capillary hemangioma, Mixed intramedullary extramedullary capillary hemangioma, Neurosurgery, Spinal tumor surgical video, Thoracic spinal cord

INTRODUCTION

Capillary hemangiomas are typically superficial benign tumors of the cutaneous and mucosal tissues of the face and neck in pediatric patients.[14] They rarely involve the central nervous system where they may produce root, cord, and/or cauda equina compression.[2] These vascular lesions account for approximately 6-7% of all intradural tumors. They are lobular and contain large feeding arterioles for each lobule. Their histology is characterized by narrowed endothelial cells.[1,14] Although capillary hemangiomas most commonly involve vertebral bodies, cord lesions may rarely include both intra- and extramedullary components. Here, a 63-year-old male presented with paraparesis attributed to an intra/extramedullary spinal cord capillary hemangioma at the T8-9 level whose symptoms/signs mostly resolved following tumor resection. The technical nuances of this resection, along with the 2-D intraoperative video [Video 1], are presented.

CASE DESCRIPTION

A 63-year-old male initially presented with a history of severe central stenosis for which he underwent an L4-5 laminectomy and *in situ* fusion performed at a previous facility. His symptoms improved and he was discharged home. However, approximately 2 months later, he developed progressive right leg weakness/numbness that markedly worsened over 2 weeks. On examination, he had 4/5 weakness in the right lower extremity, hyperreflexia, clonus, a T8 level deficit to pinprick appreciation with loss of position/vibration appreciation in both legs. The magnetic resonance imaging (MRI) scan revealed a T8-9 intradural cord lesion with both intra- and extramedullary components. There was also a high T2-weighted cord signal extending from the thoracic through the lower cervical spinal segments [Figures 1-4]. Without a spinal cord angiogram (i.e., deemed unnecessary as no flow voids were appreciated on preoperative imaging), the patient underwent a T8-9 laminectomy for tumor resection at our institution.

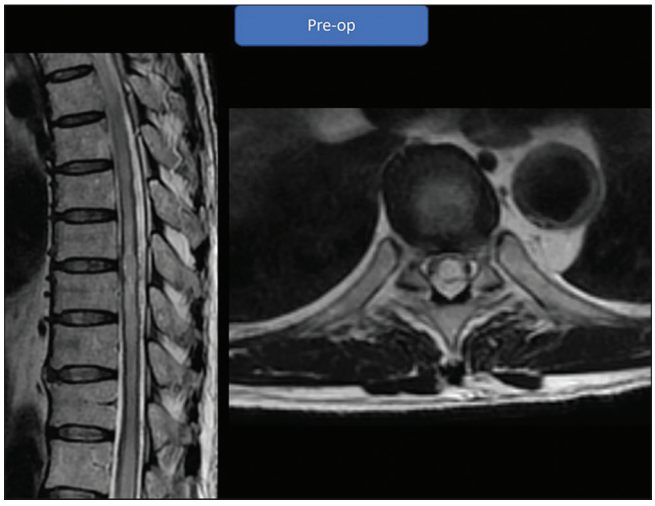


Figure 1: Preoperative T2-weighted magnetic resonance imaging scan showing significant spinal cord edema rostral and caudal to the lesion at the level of T8-9. The lesion appeared to cause focal spinal cord expansion.

Figure 2: Preoperative T2-weighted magnetic resonance imaging scan demonstrating spinal cord edema up to the level of C6.

Neurosurgical intervention

Surgery was performed using intraoperative motor evoked potentials (MEPs), somatosensory evoked potentials (SEPs), and free running electromyography. Before surgery, SEPs were decreased in the right lower extremity versus left. A midline T8-9 laminectomy and durotomy were performed under fluoroscopy. The extramedullary component of the tumor, which appeared hypervascular, was visible on the pial surface. Careful microdissection and excision techniques were used to remove the tumor through a midline myelotomy. As anticipated, SEPs transiently decreased in both lower extremities on splitting the dorsal columns and the MEP in the right lower extremity further decreased during mobilization of the tumor; however, both returned to baseline within several minutes following complete tumor resection. Intraoperative ultrasound confirmed total tumor resection and routine dural/wound closure followed.

Postoperative course

Postoperatively, there were no complications. The MRI demonstrated gross total resection of the tumor and the high T2-weighted cord signal was diminished [Figures 5a-c and 6]. Postoperatively, the patient regained full strength in the lower extremities but with some residual dorsal column dysfunction, which required short-term inpatient rehabilitation. He also had decreased perianal sensation but with intact sphincter function. The final pathology was consistent with a capillary hemangioma. One year later, the patient ambulated with an assistive device.

DISCUSSION

Capillary hemangiomas of the spinal cord are rare.[1-8,10-13,15,16] Commonly, these lesions remain extramedullary.[6] Intramedullary cord lesions more typically occur in males in their early 50s.[1,2,4-8,10-13,15,16] Patients typically present with quadriparesis or paraparesis reflecting the cervical or thoracic location of these tumors, respectively.

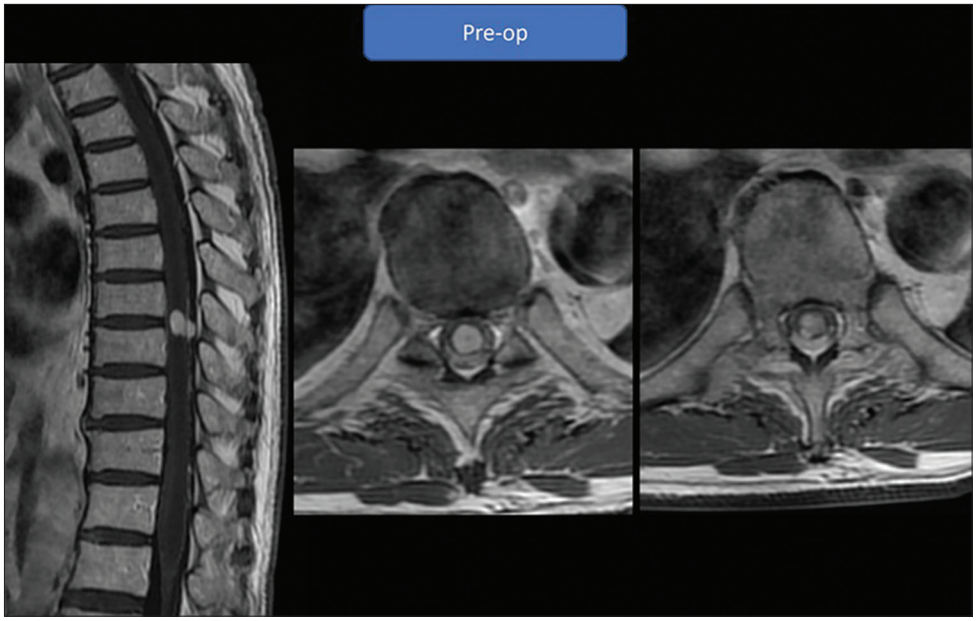


Figure 3: Preoperative T1-weighted magnetic resonance imaging scan with contrast revealed an intradural tumor with both intramedullary and extramedullary components. The tumor also appeared to be homogenously enhancing.

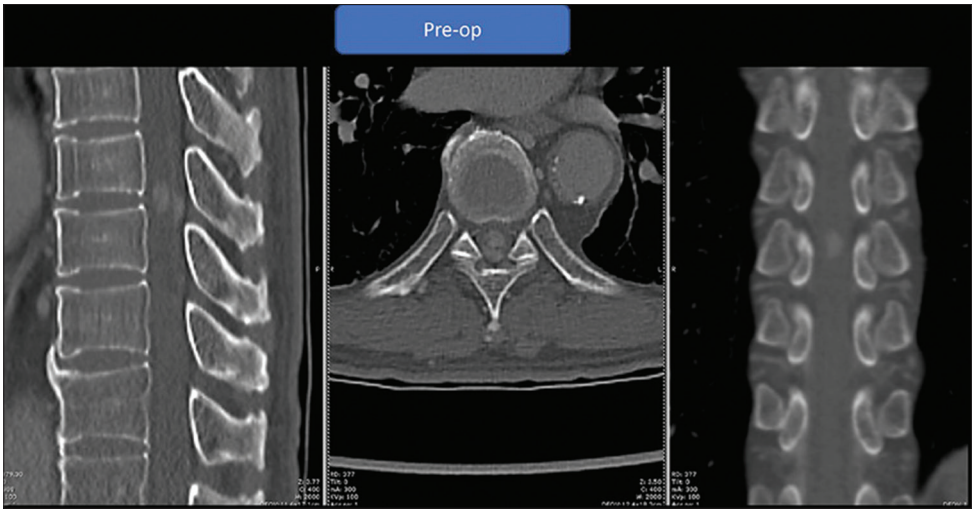


Figure 4: Preoperative computed tomography scan demonstrating an intradural tumor within the thoracic spinal cord.

MRI findings

Capillary hemangiomas are consistently isointense on T1-weighted imaging, hyperintense on T2-weighted imaging, and markedly enhance with contrast. They are typically well-marginated, which is a feature that helps to differentiate them from other intramedullary lesions (i.e., astrocytomas).[3,7,15]

Treatment

The optimal treatment regimen for these lesions is gross total *en bloc* resection.[1,6,7,9,15] When a gross total resection is not feasible, radiotherapy has been shown to be effective. Partial resection may lead to a significant decrease in the proangiogenic factors, resulting in eventual spontaneous regression.[2]

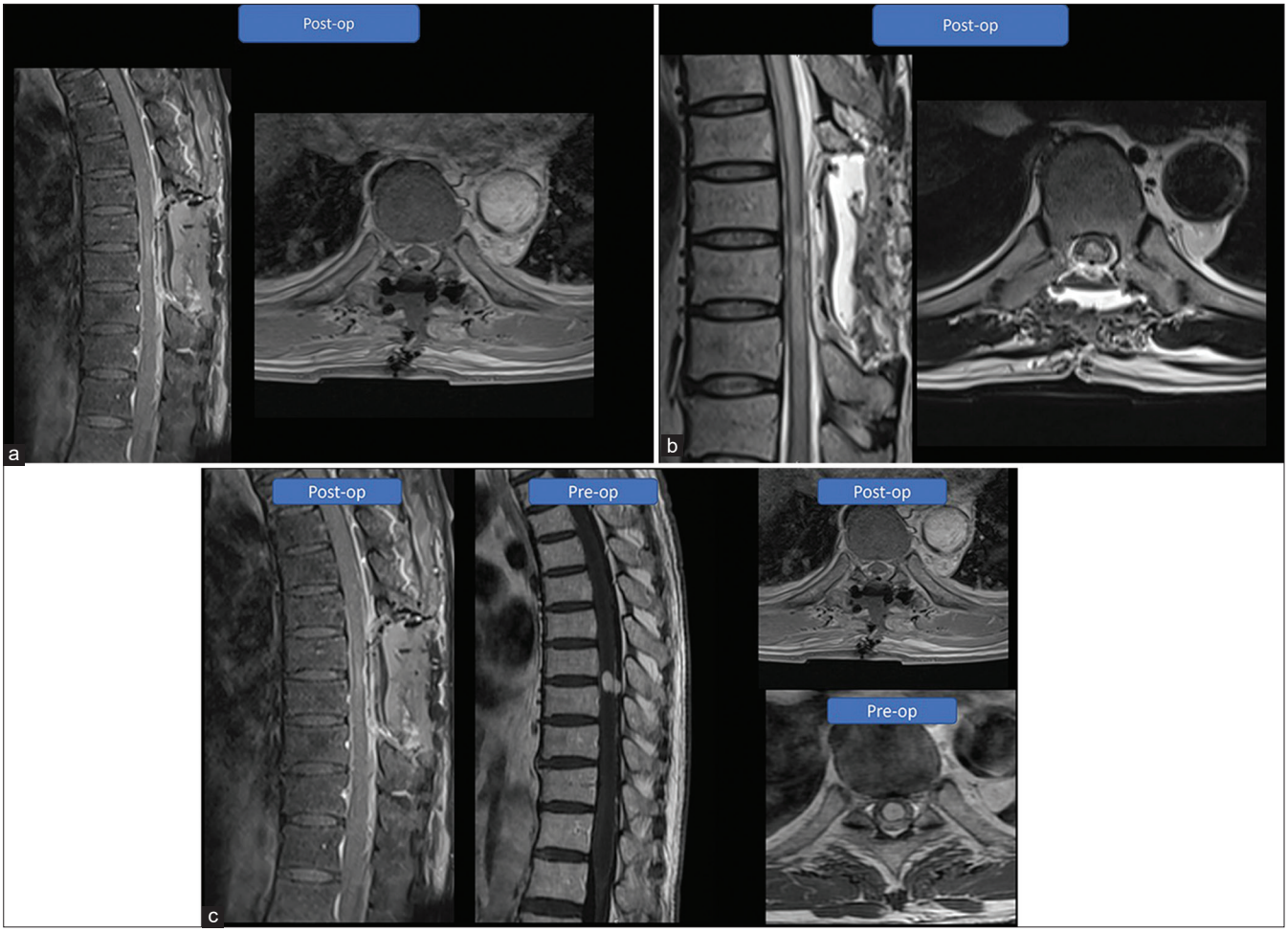
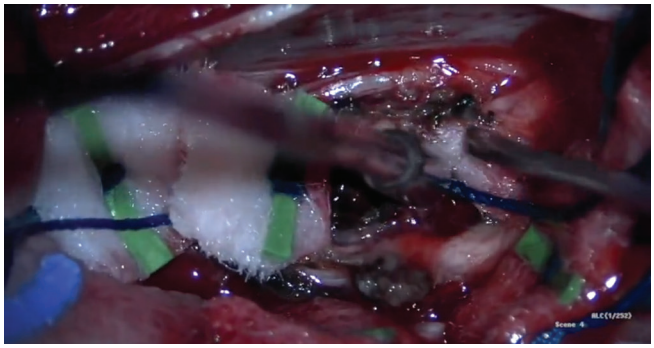


Figure 5: (a-c) Immediate postoperative magnetic resonance imaging scans showing gross total resection of the intradural capillary hemangioma following T8-9 laminectomy.



Video 1: Two-dimensional video of the technical surgical nuances of gross total resection of a mixed intra- and extramedullary capillary hemangioma in the thoracic spinal cord.

Our patient demonstrated significant improvement in his right lower extremity strength and improved dorsal column dysfunction at 12-month follow-up.

CONCLUSION

We presented a 63-year-old male with an intramedullary/extramedullary capillary hemangioma at the T8-9 level that was successfully completely excised leaving the patient with a mild residual paraparesis.

Declaration of patient consent

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

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

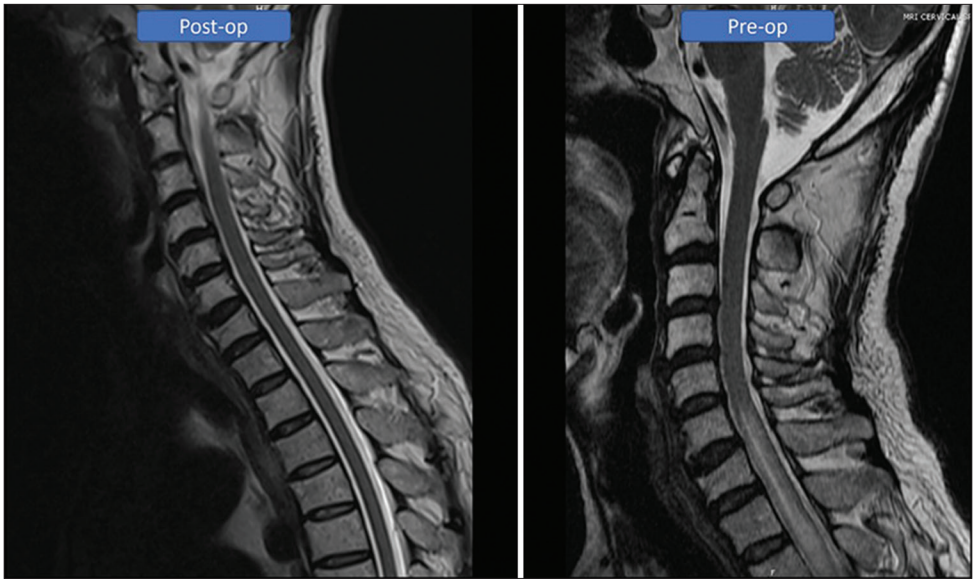


Figure 6: One month postoperative magnetic resonance imaging scan revealed near-complete regression of the spinal cord edema associated with an intradural capillary hemangioma following T8-9 laminectomy.

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