CASE REPORT

Conus medullaris haemangioblastoma in a 23-year-old man with a 2-year history of back pain: Surgical management at a tertiary hospital in Addis Ababa, Ethiopia

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Abstract

Haemangioblastomas represent fewer than 3% of all spinal cord tumours, with conus medullaris localization being exceptionally rare. A 23-year-old man presented with low back pain persisting for 2 years. Magnetic resonance imaging revealed a haemangioblastoma at the conus medullaris. He subsequently developed a sensation of incomplete urination, escalating urinary urgency, and intensifying back pain. He underwent an uneventful surgical resection, resulting in the normalization of symptoms. In resource-limited settings where neuromonitoring or embolization is unavailable, haemangioblastomas of the conus medullaris can be safely resected using meticulous microsurgical techniques.

Keywords: haemangioblastoma, conus medullaris, surgical management, Ethiopia

Introduction

Spinal cord haemangioblastomas are rare but well-recognized entities, accounting for between 1.6% and 2.1% of all spinal cord tumours, and 22.5% of haemangioblastoma cases are estimated to be associated with von Hippel-Lindau syndrome.[1],[2] The majority (75%) of these lesions are intramedullary, with cervical and thoracic locations predominating, and they are usually situated in the posterior half of the spinal cord.[1],[2] Another 10% to 15% have combined intramedullary and extramedullary-intradural components[3] that are often attached to the dorsal spinal cord pia, and in some instances, lesions arise solely from nerve roots.[4] Extradural tumours are exceedingly rare.[5]

Haemangioblastomas in the conus medullaris[2]-[5] or the extramedullary compartment adjacent to the conus medullaris[6] are extremely rare, with—to our knowledge—only 15 cases of haemangioblastoma located at the conus medullaris published in the literature to date.[7]

The rarity of haemangioblastomas in the conus medullaris and apprehension about the possibility of causing damage to surrounding neural elements may cause concern about the ideal treatment approach. Preoperative embolization and intraoperative neurophysiological monitoring are measures associated with good postoperative outcomes. However, these techniques are not available in resource-limited settings.

The impetus for publishing this case stems from the rarity of this entity in the literature and to report our surgical management and outcome in Ethiopia, where neurosurgery is still a young specialty with limited resources.

Case presentation

Clinical course

A 23-year-old man presented with a history of back pain persisting for 2 years without radiculopathy. He had been under observation by the neurosurgical unit at St. Paul's Hospital Millennium Medical College in Addis, Ababa, Ethiopia, for the previous 6 months. Thoracolumbar magnetic resonance imaging revealed a haemangioblastoma at the conus medullaris (Figure 1). He reported a sensation of incomplete urination, worsening urinary urgency, and escalating back pain despite high-dose analgesics. There was no history of radicular pain or motor weakness. The neurological examination was completely normal, including intact perianal sensation and a strong anal grip, both at rest and voluntarily.

Following discussions with the patient and obtaining his consent, we opted for surgical resection due to the progressive nature of the symptoms.

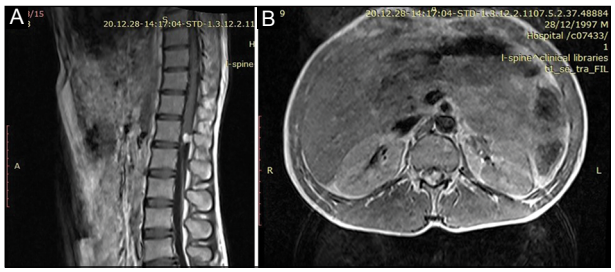

Figure 1. Magnetic resonance imaging (A, axial; B, sagittal) revealed a well-defined, heterogeneous, T2W/STIR–hyperintense and T1W-isointense lesion at the conus medullaris at the level of the T12 vertebral body. Vivid contrast-enhanced T1W images allowed for clear delineation of the mass and visualization of its extramedullary extension

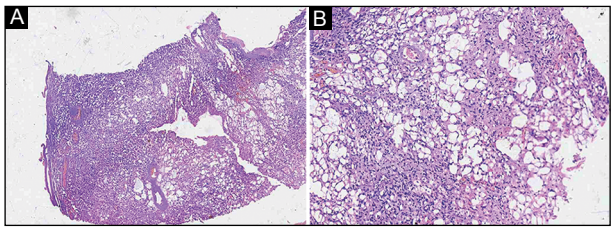

Figure 2. Histopathologic examination identified the mass as a haemangioblastoma. Sections show closely packed and variably sized thin-walled capillaries with juxtaposed ovoid to spindle-shaped cells, as well as sparse large hyperchromic cells. These cells had indistinct cytoplasm containing vacuoles that were fine, large, and clear. Capillary proliferations were scattered around large, thick-walled blood vessels with hyalinization, congested lumina, and surrounding extravasation

Operative details

The patient was placed in the prone position, and the levels T12 and L1 were localized with a fluoroscope before a midline vertical incision was made. A laminectomy of the entire T12 lamina was performed, along with a partial L1 laminectomy. We observed a thinned dorsal dura with a visible mass exerting pressure on it. Under microscopic visualization, after durotomy, a 1.5 × 1 cm dorsal reddish mass attached to the distal conus and engulfing the right side dorsal nerve roots was noted. All nerve roots engulfed by the mass were cautiously dissected, except for a single root, which was completely obliterated by the tumour and was sacrificed. Following the excision of the tumour's epiphytic component and careful cauterization to induce shrinkage, we proceeded to the intramedullary part but encountered significant bleeding. With cautious cauterization and the application of cotton patties along with continuous irrigation, haemostasis was achieved. The resection continued until the identification of an ill-defined border into the conus medullaris. Further exploration—which could have led to nervous tissue damage—was deemed risky because of the absence of intraoperative neuromonitoring and the lack of proper haemostatic materials to manage bleeding. After meticulously confirming haemostasis, we closed the wound in layers.

Postoperative course

The patient tolerated the procedure well, with his only complaint being lower back pain at the surgical wound site. His urinary catheter was removed after 48 hours, and he experienced urinary retention; he was recatheterized and monitored for the sensation of a full bladder. Ultimately, the catheter was removed on the fifth postoperative day when he was able to urinate independently without any residual urine. Abdominopelvic ultrasonography was performed, and the urinary bladder wall was found to be normal, with a prevoid volume of 334 cm^3 and a postvoid volume of 14 cm^3. He exhibited no postoperative motor weakness or radicular pain. The remainder of the postoperative course was uneventful, and he was discharged home.

Histopathologic diagnosis confirmed the lesion as a haemangioblastoma (Figure 2). Postoperative contrast-enhanced magnetic resonance imaging revealed that only the intramedullary part of the tumour remained (Figure 3). Imaging analysis revealed that the mass shrunk from 0.94 cm^3 preoperatively to 0.25 cm^3 postoperatively, representing a 73% volume reduction.

Discussion

The relatively low incidence of haemangioblastoma in the conus medullaris has led to a paucity of detailed literature regarding the optimal management of these tumours.[8] It has been established that the primary predictor of long-term postoperative outcomes for haemangioblastomas is the patient's preoperative neurological condition.[9]

The objective of surgery should be maximal safe resection, as recurrence rates are notably high following subtotal removal, even when postoperative radiotherapy is given.[1] To achieve maximal safe resection, surgeons typically preoperatively embolize these tumours to minimize bleeding, and intraoperative neurophysiological monitoring is employed to prevent damage to neural structures. However, such facilities are not available in resource-limited settings such as ours. We also lack the haemostatic materials that are commonly available in well-resourced contexts. We acknowledge that a lack of resources may lead to inordinately high complication rates.

In this patient with a haemangioblastoma with both intramedullary and extramedullary extension and extensive root invasion at the conus medullaris, the absence of a well-defined border between the conus and the lesion made complete excision of the tumour challenging. By employing careful microsurgical techniques, we achieved a 73% volume reduction of the tumour. Intraoperative bleeding was managed using several measures, such as applying cotton patties,

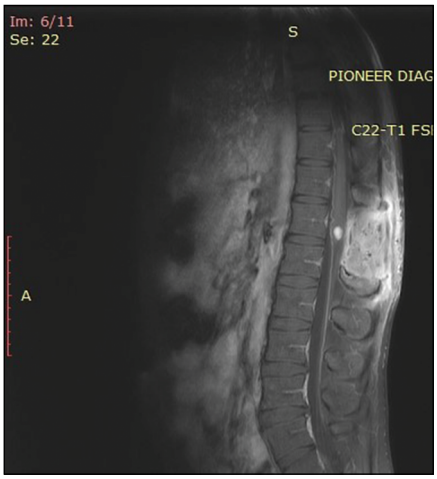

Figure 3. Postoperative magnetic resonance imaging revealed volume reduction of the conus medullaris haemangioblastoma and the intramedullary remnant

crushed muscle, irrigation, and pausing to allow for haemostasis. Nevertheless, a significant challenge we faced was the lack of intraoperative neuromonitoring, which would have allowed for a greater extent of resection without risking neurological sequelae. To mitigate this, we proceeded with cautious dissection to differentiate between the tumour border and neural tissue. When difficulties arose, we chose to leave the remaining tumour in situ.

The procedure was uneventful, and the patient reported subjective improvement in the sensation of incomplete urinary emptying and urgency. At the 1-month postoperative follow-up visit, he reported intermittent back pain, but this was significantly milder than his preoperative back pain, and he had returned to work. He expressed gratitude for the surgery.

Postoperative magnetic resonance imaging showed a remnant of the tumour, and we plan to monitor the patient closely going forward.

Conclusions

This case report contributes to the few reports of haemangioblastoma in the conus medullaris in the literature and underscores the challenges faced in resource-constrained settings. Despite the scarcity of proper haemostatic materials, preoperative embolization, and neuromonitoring, our experience suggests that with meticulous microsurgical techniques, such tumours can be resected safely. The successful outcome, in this case, indicates that skilful surgery can mitigate the risk of complications even in the absence of valuable surgical amenities.

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