CASE REPORT

Cervical Intramedullary Cavernous Haemangioma: A Rare Cause of Acute Hemiparesis

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Keywords
Spinal Cord, Haemorrhage, Haemangioma Cavernous

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Received: 9th August 2024; Accepted: 6th Mac 2025

Doi: https://doi.org10.31436/imjm.v24i04.2690

ABSTRACT

This case report describes a 45-year-old female who presented with acute hemiparesis and was initially diagnosed with acute ischemic stroke. Subsequent evaluation of her non -contrast computed tomography (NCCT) brain revealed a lesion in her spinal cord, which was further identified as intramedullary mass on cervical spine magnetic resonance imaging (MRI). This case underscores the importance of differential diagnosis in patients presented with acute hemiparesis, comprehensive assessment of NCCT scan, and the crucial role of MRI in diagnosing spinal cord lesions. Surgical intervention, involving laminectomy and excision of the lesion, was essential and resulted in significant postoperative improvement, highlighting the pivotal role of surgery in managing such conditions.

INTRODUCTION

Intramedullary cavernous haemangioma is a rare vascular anomaly, accounting for approximately 3-5% of central nervous system lesions and 5-12% of spinal vascular abnormalities.[1] These lesions can present with a variety of clinical symptoms, including motor deficits (60%), sensory deficits (58%), pain (34%), and bladder and/or bowel dysfunction (24%).[2] Stroke mimics are medical conditions presenting symptoms akin to those of stroke but with different underlying causes.[3] Unlike stroke which is caused by interrupted blood flow to the brain, stroke mimics may originate from various factors such as brain tumours, migraines, seizures, infections, or metabolic disturbances.[4] The varied presentations of intramedullary cavernous haemangioma can mimic stroke symptoms, creating diagnostic challenges.

CASE PRESENTATION

A 45 year old female with no cerebrocardiovascular risk factors and no prior medical conditions presented with 2 days onset of right-sided upper and lower limb weakness associated with progressive left-sided neck pain radiating to the occipital and parietal areas, unaffected by movement or posture. Otherwise, she reported no infective symptoms, no neurological deficits, or notable family medical history.

Initial examination showed stable vital signs, with a blood pressure of 127/90 mmHg and a pulse rate of 63 beats per minute. She was fully conscious and orientated to time, place, and person. Her pupils were symmetrically reactive to light with normal cranial nerves findings, except for the hypoglossal nerve (12th cranial nerve) which showed right -sided deviation and twitching of the tongue. Strength on her right side was diminished (3/5) compared to the full strength (5/5) on her left; reflexes were brisk. Her sensory and cerebellar functions were normal.

Blood sugar level was 6.4 mmol/L. Blood tests, including a full blood picture, renal function, and coagulation profile, were also within normal limits. Her initial diagnosis was acute ischemic stroke. No stroke activation was done as she was not in the stroke activation window. A non-contrast computed tomography (NCCT) brain reviewed by the emergency team, showed multiple old infarcts, and she was started on a dual antiplatelet regimen and admitted. Further evaluation of the NCCT brain the next day by the neuromedical team in the ward revealed a spinal cord haemorrhage (Figure I), with no additional neurological worsening noted. An MRI uncovered an eccentric intramedullary mass at C2/C3, with associated spinal cord oedema and haemorrhage (Figure II).

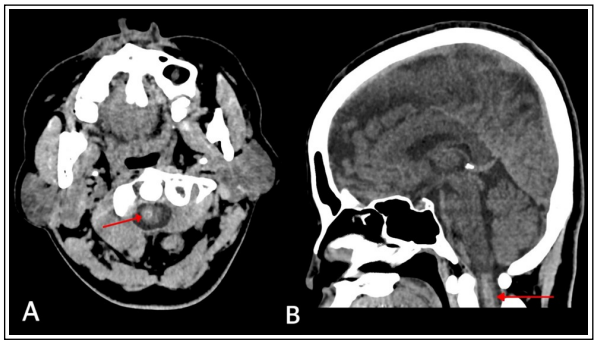

Figure I: Non-contrast computed tomography (NCCT) images reveal intramedullary hyperdensity consistent with spinal cord haemorrhage (red arrow). Axial view (A); Sagittal view (B)

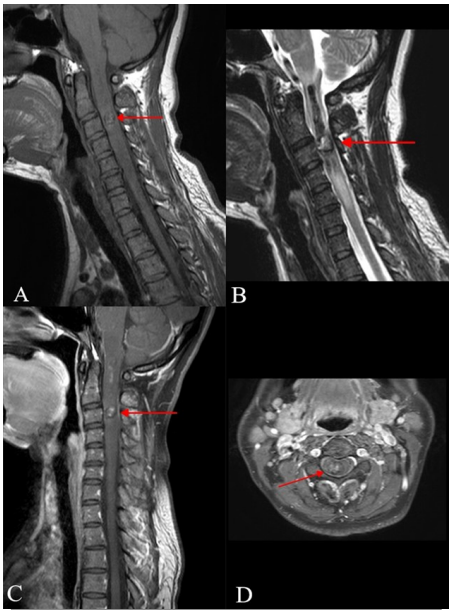

Figure II: Cervical magnetic resonance imaging T1-weighted(A), T2-weighted(B), post-gadolinium(C), post-gadolinium (D) sections showing an intramedullary lesion at the level of C2/C3 with spinal cord oedema and haemorrhage extending superiorly to the craniocervical junction. Sagittal view (A-C); Axial view D

An emergency C3 laminectomy, was performed. Intraoperatively, the lesion was dissected and a clean base was obtained (Figure III). A histological examination revealed the typical features of cavernous haemangioma.

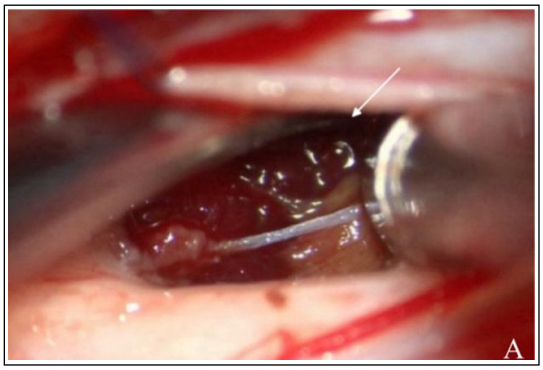

Figure III: Intraoperative photographs of cervical intramedullary cavernous haemangioma excision. Exposure of the cavernous haemangioma after C3 laminectomy and dural incision, showing the haemangioma within the spinal cord parenchyma (white arrow).

Postoperatively, her hemiparesis improved gradually with resolved 12th cranial nerve palsy, leaving residual paraparesis in her right upper limb. She was discharged on the 30th day, with a five-month follow-up with MRI planned.

DISCUSSION

Cerebral cavernous haemangiomas, which show no gender preference, spinal cord cavernous haemangiomas pose unique clinical challenges due to their tendency to haemorrhage and the diverse clinical manifestations they can induce.[1] Clinical manifestations of intramedullary cavernous haemangioma can range from asymptomatic to symptomatic. Motor deficits tend to involve only one limb or extremity, whereas hemiparesis was found in only 2 out of 26 cases.[2] Its clinical course tends to be chronic, except during haemorrhagic events, which are acute. These manifestations can be categorized into four distinct patterns, ranging from acute deterioration following haemorrhages to mild symptoms with gradual decline, illustrating the variability in disease progression and highlighting the critical importance of tailored management strategies.[5] It is also prone to repeated haemorrhage and growth over time.

The initial evaluation of suspected acute stroke typically relies on NCCT brain, which serves as the primary imaging tool to differentiate between stroke subtypes (ischemic vs haemorrhagic) and to rule out conditions that mimic stroke,[6] a step that was taken with our patient upon her presentation with acute right hemiparesis. However, the initial review of her NCCT brain focused solely on the cerebral hemispheres, inadvertently omitting a thorough examination of the spinal cord. Consequently, the spinal cord lesion remained undetected. It was only upon further assessment and evaluation in the ward that the spinal cord lesion was detected, leading to the performance of MRI.

Acute hemiparesis is a common clinical presentation of acute stroke. However, not all hemiparesis is due to acute stroke. One of the rarest causes of acute hemiparesis is intramedullary cavernous haemangioma, a rare vascular malformation within the central nervous system, defined

by abnormal sinusoidal spaces that are dilated and devoid of intervening nervous tissue.[1] It can be epidural, intradural, or intramedullary, with the latter being exceptionally rare.[2]

The hypoglossal nerve palsy (12th nerve palsy) observed in our patient supported the initial diagnosis of stroke. The potential causes of hypoglossal nerve palsy (HNP) encompass tumour, neck trauma, stroke, infection, skull base disorders, and craniocervical degenerative diseases.[7] In our case, the hypoglossal nerve palsy was likely resulted from oedema in the lower medulla, which exerted pressure on the hypoglossal nerve. This conclusion is extrapolated from MRI findings that also revealed an extension of the haemorrhage to the craniocervical junction. This situation mirrors another case, where a gentleman presented with neck pain and hypoglossal nerve palsy; his MRI detected an atlantooccipital spinal cord cyst with compression to the hypoglossal nerve.[7] Therefore, comprehensive evaluation, including MRI, is crucial for accurately diagnosing patients with neck pain, acute hemiparesis, and cranial nerve palsies.

MRI is the best imaging modality and plays a crucial role in achieving an accurate diagnosis by differentiating this haemangioma from inter-tumoral haemorrhages and other spinal cord pathologies.[1] A lesion of mixed signal intensity with a surrounding hypointense rim on T2-weighted MRI with minor contrast enhancement suggests cavernous haemangioma as seen in our patient. Adjacent intramedullary haemorrhage is a common finding. The presence of haemorrhage might narrow the differential diagnosis to include thrombosed arteriovenous malformation (AVM), telangiectasia, or spinal cord hemangioblastoma.[8] The MRI is superior over NCCT in identifying lesions, with NCCT missing several lesions, emphasizing the diagnostic advantage of MRI. Thus, the possibility of missing spinal cord haemorrhage on NCCT is significant.[9] However, since NCCT is always the first imaging modality for a suspected stroke case, clinicians should meticulously examine the entire scan, including the spinal cord, to eliminate the possibility of spinal cord lesions. This is a crucial practice, especially when the suspected stroke case involves a relatively young patient with neck pain, normal blood pressure and without any cerebrocardiovascular risk factors.

Surgical intervention is essential for unstable spinal cavernous haemangioma to prevent neurological deterioration, with complete resection resulting in stable or improved outcomes in 92% of cases.[1] The typical procedure entails a laminectomy or hemilaminectomy at the appropriate spinal level. Following MRI confirmation, our patient underwent emergency C3 laminectomy for complete haemangioma excision. Postoperatively, with adequate physiotherapy, significant improvement in right hemiparesis was observed, aligning with outcomes in similar cases.[2] In a retrospective study, immediate postoperative neurological improvement was noted in 5 patients, with 46% reporting enhanced motor strength during follow-up.[10]

CONCLUSION

Intramedullary cavernous haemangioma has variable presentations, including acute hemiparesis, which mimics a stroke. Clinicians should thoroughly examine the entire scan in a relatively young patient who presents with neck pain, normal blood pressure, and no cerebrocardiovascular risk factors.

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