



Case Report

Intradural extramedullary cervical cavernoma

Ghassen Gader¹, Wiem Mansour¹, Mohamed Ali Kharrat¹, Housseem Hdhili¹, Ines Chelly², Kamel Bahri¹, Ihsèn Zammel¹

¹Department of Neurosurgery, Trauma and Burns Center, Ben Arous, ²Department of Pathology, La Rabta Hospital, Tunis, Tunisia.

E-mail: *Ghassen Gader - ghassgader@gmail.com; Wiem Mansour - wiiemmansour@gmail.com; Mohamed Ali Kharrat - kharrat.mohamedali.95@gmail.com; Housseem Hdhili - hdhili1@hotmail.fr; Ines Chelly - ineschelly@yahoo.fr; Kamel Bahri - kamelbahri@yahoo.com; Ihsèn Zammel - ihsenzammel@hotmail.com



*Corresponding author:

Ghassen Gader,
Department of Neurosurgery,
Trauma and Burns Center, Ben
Arous, Tunisia.

ghassgader@gmail.com

Received: 04 July 2024

Accepted: 20 July 2024

Published: 23 August 2024

DOI

10.25259/SNI_542_2024

Quick Response Code:



ABSTRACT

Background: Spinal cavernomas (SCs) account for about 5% of all spinal vascular malformations. Intradural SCs occur in just 3% of cases and are typically intramedullary.

Case Description: A 58-year-old female presented with progressive left occipital neuralgia, left cervicobrachial neuralgia, and paresthesia of all four extremities. The magnetic resonance imaging (MRI) revealed an intradural extramedullary C2–C4 lesion causing significant spinal cord compression. Gross total tumor excision was accomplished through a midline laminectomy pathologically; the lesion proved to be a cavernoma. The postoperative follow-up MRI obtained 4 months postoperatively showed complete tumor resection.

Conclusion: A 58-year-old female successfully underwent gross total excision of a C2–C4 intradural extramedullary SC.

Keywords: Cavernoma, Cervical spine, Extramedullary, Intradural

INTRODUCTION

Cavernomas, also called cavernous malformations or cavernous angiomas, are rare developmental low-flow vascular malformations.^[7,18] Although spinal cavernomas (SCs) comprise 5% of all spinal vascular malformations, only 3% are intradural and extramedullary lesions. According to Ismaiel *et al.*,^[7] only 41 cases of intradural extramedullary cavernomas have been published to date. Here, a 58-year-old female with a cervical intradural extramedullary C2–C4 cavernoma successfully excised through a laminectomy.

CASE PRESENTATION

A 58-year-old female presented with progressive left occipital neuralgia for 3 months, left non-systematized cervicobrachial neuralgia for 2 months, and paresthesia of all four extremities for 1 month. She had mild cervical pain and hyperactive reflexes but was otherwise neurologically intact. The cervical magnetic resonance imaging (MRI) [Figure 1] showed an intradural extramedullary anterior/left sided C2–C4 heterogeneous mass (i.e., 12 × 16 mm) markedly compressing the cord. It was hyperintense on T1-weighted imaging (WI) and hypointense on T2-WI.

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

©2024 Published by Scientific Scholar on behalf of Surgical Neurology International

Table 1: Summary of literature for cervical intradural extramedullary cavernoma.

Case No.	Author	Age and gender	Level	Origin	Symptoms	Resection	Outcome
1	Ortner, 1973 ^[12]	22, M	C4–C7	ND	SAH Tetraplegia	Total	No improvement
2	Acciarri, 1992 ^[11]	54, F	C2–C3	Dura	SAH	Total	Complete
3	Harrison, 1995 ^[5]	37, M	CCJ–C5	Root	Brown-Sequard syndrome	Total	Incomplete
4	Nozaki, 2003 ^[12]	51, M	C5–C6	Root	Shoulder pain, Sensory-motor deficit	Total	Complete
5	Park, 2003 ^[14]	61, M	C1–C2	ND	Headache	Total	Complete
6	Rachinger, 2006 ^[17]	56, M	C6–C7	Root	Rachialgia, Sensory deficit	Total	Complete
7	Kivelev, 2008 ^[10]	44, M	C5–C6	Root	Brown-Sequard syndrome, Incontinence	Total	Incomplete
8	Henderson, 2018 ^[6]	65, F	C6	Root	Radiculopathy, sensory deficit	Total	Complete
9	Petillon, 2018 ^[15]	76, F	C7–C8	Root	Neck pain	Total	Complete
10	Frank, 2022 ^[4]	45, M	C5–C6	Root	SAH, radiculopathy	Total	Complete
11	Present Case	58, F	C2–C4	Pia Mater	Occipital and cervicobrachial neuralgia	Total	Complete

ND: Not determined, M: Male, F: Female, CCJ: Craniocervical junction, SAH: Subarachnoid hemorrhage

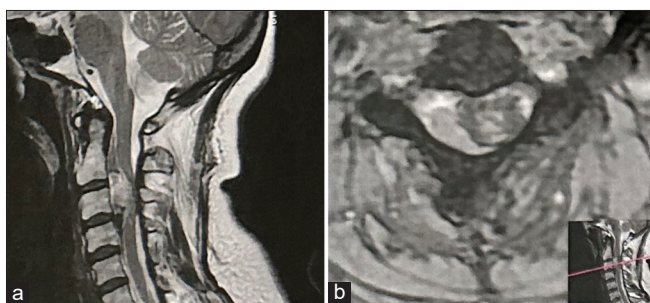


Figure 1: (a) Sagittal and (b) axial sections of a cervical spine magnetic resonance imaging on T2-weighted imaging (a and b) showing an anterior intradural extramedullary lesion at the level of C2–C4.

Surgery

Through a laminectomy of C2, C3, and C4 and durotomy, a dense, non-hemorrhagic tumor was encountered that was readily removed; there was a clear plane between the cord and the nerve roots. Pathologically, the tumor proved to be a cavernoma [Figure 2]. One month postoperatively, she had complete relief of her occipital and cervicobrachial neuralgia and exhibited only mild residual left upper arm paresthesias. The follow-up spinal MRI [Figure 3] performed 4 months postoperatively confirmed total lesion excision.

DISCUSSION

SCs are rare, representing between 5% and 12% of all spinal vascular anomalies.^[2,7] Notably, only 3% are located intradurally, and most are located intramedullary. Of the roughly 40 cases of intradural extramedullary cavernomas reported in the literature, we were able to identify ten cervical lesions^[3] [Table 1]. Intradural extramedullary

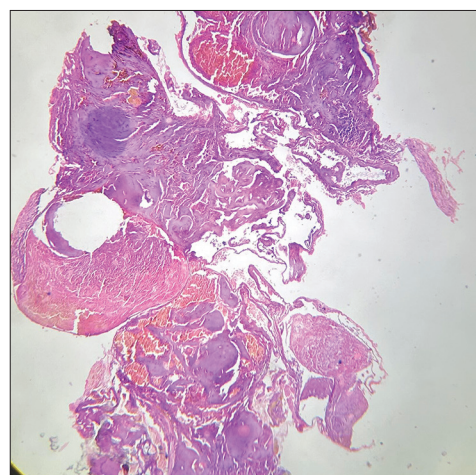


Figure 2: The pathologic examination at HE (Hematoxylin and Eosin) stain at ×200 magnification reveals a notable proliferation of blood vessels. These vessels exhibit dilated lumens, which are prominently filled with red blood cells, indicating vascular congestion. The walls of these vessels are thickened and fibrous, suggesting a chronic process or significant fibrosis.

cavernomas are most commonly encountered in the lumbar region, followed by the thoracolumbar junction, lower thoracic region, and cervical region.^[7,8] Very rarely, the cavernomas precipitate the sudden onset of paraplegia due to an acute hemorrhage.^[11,15]

MR Diagnostic study of choice

MRI is the study of choice for diagnosing intradural extramedullary cavernomas.^[3] They are defined by a

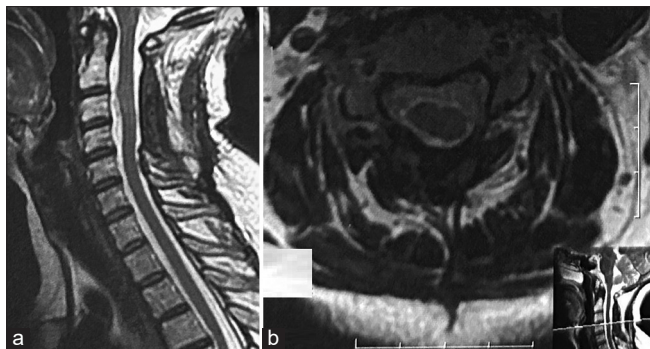


Figure 3: Sagittal (a) and axial (b) sections of a cervical spine magnetic resonance imaging on T2-weighted imaging (WI) (a) and T1-WI (b) showing a complete removal of the cavernoma.

reticulated core of mixed intensity, which can be associated with calcifications or dense fibrocartilage.^[7] Cavernous angiomas often present with a surrounding rim of decreased signal intensity on T2-WI.^[3] Notably, spinal angiography is not particularly helpful in diagnosing SC.^[2,16]

Treatment

Cavernomas are benign lesions, and the optimal treatment is complete surgical removal, typically through laminectomies; often, there are clear planes between cavernomas and the surrounding neural structures^[9,18] [Table 1]. They are typically slow-growing, but acute intralesional hemorrhage may lead to precipitous neural compression, warranting emergent surgical intervention.^[3,15]

CONCLUSION

A 58-year-old female successfully underwent gross total excision of a C2–C4 intradural extramedullary SC.

Ethical approval

The Institutional review board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

REFERENCES

1. Acciari N, Padovani R, Pozzati E, Gaist G, Manetto V. Spinal cavernous angioma: A rare cause of subarachnoid hemorrhage. *Surg Neurol* 1992;37:45-6.
2. Colamaria A, Sacco M, Iodice S, D'Oria S, Parbonetti G, Carbone F. Intradural extramedullary cavernous hemangioma of the cervicothoracic junction: A case report and review of the literature. *Surg Neurol Int* 2022;13:53.
3. Crispino M, Vecchioni S, Galli G, Olivetti L. Spinal intradural extramedullary haemangioma: MRI and neurosurgical findings. *Acta Neurochir (Wien)* 2005;147:1195-8.
4. Frank BL, Harrop JS, Hanna A, Ratliff J. Cervical extradural meningioma: Case report and literature review. *J Spinal Cord Med* 2008; 31:302–5.
5. Harrison MJ, Eisenberg MB, Ullman JS, Oppenheim JS, Camins MB, Post KD. Symptomatic cavernous malformations affecting the spine and spinal cord. *Neurosurgery* 1995;37:195-204.
6. Henderson F Jr., Skipper DC, Patel S. Cervical spinal root cavernoma: Case report and review. *Br J Neurosurg* 2018;32:445-7.
7. Ismaiel N, Ibrahim H, Jabbour G, Joha M, Abdulrahman M, Alshehabi Z. Spinal intradural extramedullary cavernoma: A case report. *Int J Surg Case Rep* 2024;115:109274.
8. Jin YJ, Chung SB, Kim KJ, Kim HJ. Spinal intradural extramedullary cavernoma presenting with intracranial superficial hemosiderosis. *J Korean Neurosurg Soc* 2011;49:377-80.
9. Katoh N, Yoshida T, Uehara T, Ito K, Hongo K, Ikeda S. Spinal intradural extramedullary cavernous angioma presenting with superficial siderosis and hydrocephalus: A case report and review of the literature. *Intern Med* 2014;53:1863-7.
10. Kivelev J, Ramsey CN, Dashti R, Porras M, Tyninen O, Hernesniemi J. Cervical intradural extramedullary cavernoma presenting with isolated intramedullary hemorrhage. *J Neurosurg Spine* 2008;8:88-91.
11. Nie QB, Chen Z, Jian FZ, Wu H, Ling F. Cavernous angioma of the cauda equina: A case report and systematic review of the literature. *J Int Med Res* 2012;40:2001-8.
12. Nozaki K, Inomoto T, Takagi Y, Hashimoto N. Spinal intradural extramedullary cavernous angioma. Case report. *J Neurosurg* 2003;99:316-9.
13. Ortner WD, Kubin H, Pillz P. Ein zervikales kavernooses angiom. *Fortschr Roentgenstr* 1993;118:475-6.
14. Park J, Chung C, Kim H. Intradural-extramedullary spinal cavernous angioma as a cause of subarachnoid hemorrhage. *J Korean Neurosurg Soc* 2003;34:174-6.
15. Pétillon P, Wilms G, Raftopoulos C, Duprez T. Spinal intradural extramedullary cavernous hemangioma. *Neuroradiology* 2018; 60:1085–7.
16. Poudel P, Chiluwal AK, Nouri M. Intradural extramedullary

cavernous malformation of the spinal cord with hemorrhagic transformation and rapid expansion. *Case Rep Neurol Med* 2022;2022:8677298.

17. Rachinger J, Buslei R, Engelhorn T, Doerfler A, Strauss C. Intradural-extramedullary cavernous hemangioma of the left motor root C7 - case report and update of the literature. *Zentralbl Neurochir* 2006;67:144-8.
18. Ziechmann R, Zyck S, Krishnamurthy S, Galgano M.

Intradural extramedullary thoracic cavernoma in a man with familial multiple cavernomas. *Cureus* 2018;10:e3115.

How to cite this article: Gader G, Mansour W, Kharrat M, Hdhili H, Chelly I, Bahri K, *et al.* Intradural extramedullary cervical cavernoma. *Surg Neurol Int.* 2024;15:294. doi: 10.25259/SNI_542_2024

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Journal or its management. The information contained in this article should not be considered to be medical advice; patients should consult their own physicians for advice as to their specific medical needs.