Open Access Library Journal
2025, Volume 12, e12840
ISSN Online: 2333-9721
ISSN Print: 2333-9705

Hemangiopericytoma of the Falx Cerebri: A Rare Intracranial Tumor: A Case Study

Ilias Zahir, Kaoutar Stitou, Oualid Mohammed Hmamouche, Marouane Hammoud, Faycal Lakhdar, Mohammed Benzagmout, Khalid Chakour, Mohammed El Faiz Chaoui

Department of Neurosurgery, University Hospital of Fez, Fez, Morocco

Email: zahirilias92@gmail.com, kaoutar.stitou23@gmail.com, oualid.hmamouche@usmba.ac.ma, marouane.hammoud@gmail.com, lakhdar.faycal@gmail.com, benzagmout@hotmail.fr, chakour.khalid@gmail.com, fmchaoui@yahoo.fr

How to cite this paper: Zahir, I., Stitou, K., Hmamouche, O.M., Hammoud, M., Lakhdar, F., Benzagmout, M., Chakour, K. and Chaoui, M.E.F. (2025) Hemangiopericytoma of the Falx Cerebri: A Rare Intracranial Tumor: A Case Study. *Open Access Library Journal*, **12**: e12840.
https://doi.org/10.4236/oalib.1112840

Received: December 20, 2024
Accepted: January 27, 2025
Published: January 30, 2025

Abstract

Meningeal hemangiopericytoma is a rare tumor that accounts for less than 1% of brain tumors. Its radiological appearance can be misleading and may lead to a misdiagnosis of meningioma. The definitive diagnosis is histological. Treatment primarily involves surgery and radiotherapy. The post-treatment course is characterized by frequent recurrences and distant metastases, requiring long-term follow-up. We report the case of a patient with a falx cerebri hemangiopericytoma whose progression was notable for the absence of recurrence after four years of follow-up.

Subject Areas

Surgery & Surgical Specialties

Keywords

Meningeal Hemangiopericytoma, Falx Cerebri, Tumor Surgery, Radiotherapy

1. Introduction

Intracranial hemangiopericytomas are rare mesenchymal tumors originating from Zimmerman's pericytes, which are contractile cells surrounding the capillaries. These tumors make up less than 1% of all brain tumors and are often misdiagnosed as meningiomas due to their nonspecific radiological appearance. Hemangiopericytomas have malignant potential, frequent recurrences, and the ability to metastasize, making wide surgical excision and postoperative radiotherapy essential for management.

2. Case Report

Mr. BA, a 41-year-old male, presented with a four-month history of severe headaches and diminished visual acuity. A CT scan revealed a tumor in the median temporo-occipital region, measuring 90 × 57 × 51 mm, with a hyperdense base, well-defined contours, and poly-lobulated shape. This lesion showed intense enhancement, surrounded by a hypodense area infiltrating adjacent white matter. Brain MRI confirmed an extra-parenchymal lesion located at the falx cerebri, with significant enhancement and surrounding edema, causing a slight displacement of midline structures. Radiological findings were suggestive of either an atypical hypervascular meningioma or a hemangiopericytoma (see Figure 1).

The patient underwent surgery with complete resection of the hemorrhagic mass infiltrating the falx cerebri. A postoperative MRI confirmed complete excision of the tumor (Figure 2). Histological and immunohistochemical analyses

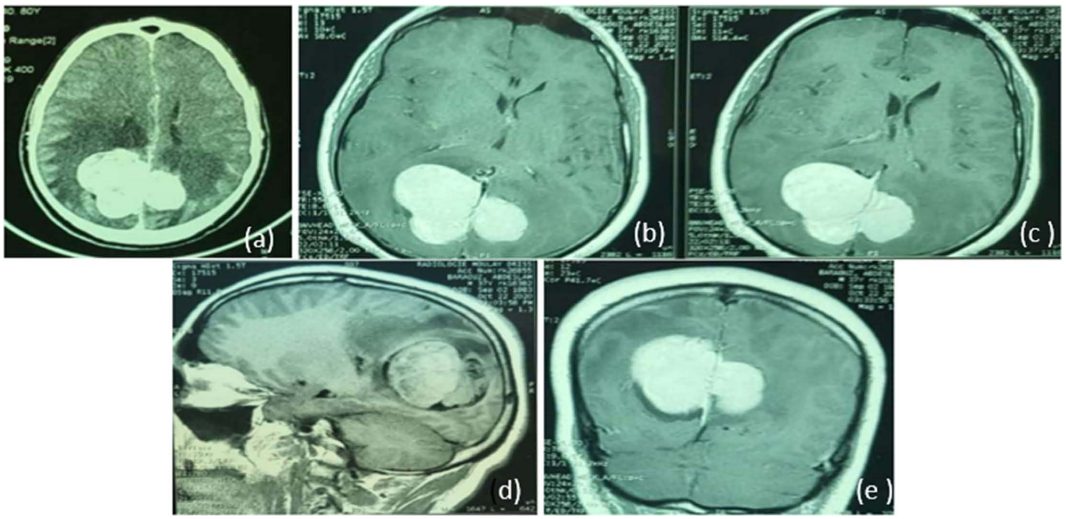

Figure 1. (a) Contrast-enhanced brain CT scan revealed a tumor in the median temporo-occipital region, measuring 90 × 57 × 51 mm, with a hyperdense base, well-defined contours, and poly-lobulated shape. This lesion showed intense enhancement, surrounded by a hypodense area infiltrating adjacent white matter., axial section; (b) (c) MRI, axial T1 with contrast; (d) (e) MRI, sagittal and coronal T1 with contrast, coronal T1 with contrast, extra-parenchymal lesion located at the falx cerebri, with significant enhancement and surrounding edema, causing a slight displacement of midline structures.

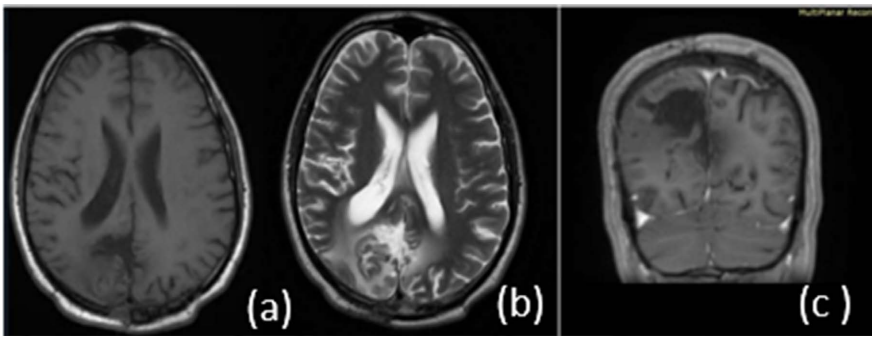

Figure 2. Postoperative MRI: (a) T1 axial, (b) T2 axial and (c) coronal T1 with contrast, showing complete tumor resection with no residual tumor.

were critical in confirming the diagnosis of grade 2 hemangiopericytoma, distinguishing it from other grade 2 mesenchymal tumors. Key markers used included CD34 and STAT6 positivity, as well as mitotic activity assessment to establish the grade.

Postoperatively, the patient was referred for radiotherapy, receiving 45 sessions with favorable clinical and radiological progress, although bilateral blindness persisted as a sequela. Postoperative follow-up was planned with regular imaging studies every three months during the first year, followed by annual evaluations. Neurological assessments were also scheduled to monitor any functional recovery or signs of recurrence. Radiotherapy was administered in 45 sessions, demonstrating satisfactory tumor control despite the visual deficit remaining unchanged.

3. Discussion

Hemangiopericytomas (HPs) are rare, accounting for less than 1% of all intracranial tumors. They typically occur in individuals between the ages of 38 and 42 and often involve the supratentorial region, as observed in our patient. Initially considered subtypes of meningiomas by Bayley *et al.* [1], HPs differ significantly in their cellular origin, as they arise from pericytes surrounding capillaries, while meningiomas originate from arachnoid cells. The term "hemangiopericytoma" was first introduced by Stout and Murray in 1942 [2]. The World Health Organization (WHO) later classified it as a malignant non-meningothelial mesenchymal tumor of the meninges.

Clinically, symptoms vary depending on the tumor's location and size. Supratentorial HPs present with headaches and, less frequently, sensory-motor deficits, visual disturbances, or seizures. Lesions in the posterior fossa often cause balance issues, and parasellar tumors may be presented as cavernous sinus syndrome. Imaging modalities such as CT or MRI are instrumental in characterizing the tumor, though they often do not distinguish HP from meningioma [3]. Angiography can aid in identifying the hypervascular nature of HPs. Definitive diagnosis is made via immunohistochemistry, with HPs typically expressing mesenchymal markers such as CD34 but negative for anti-factor VIII and S-100 protein antibodies [4].

Treatment involves surgical resection followed by radiotherapy. Complete surgical excision is recommended, though the tumor's hemorrhagic nature often complicates the procedure [5].

Preoperative embolization may be considered to reduce vascularity, though its effectiveness varies [2].

Radiotherapy is essential to reduce recurrence and improve survival. Studies show that doses above 50 Gy significantly lower recurrence rates. Immediate postoperative radiotherapy, even after complete excision, is crucial for prolonging remission [6]. For example, Jeong *et al.* [7] reported a 100% 5-year remission rate for patients receiving both surgery and radiotherapy compared to 70.3% for those undergoing surgery alone.

The recurrence rate of HP is high, with local recurrence rates ranging from 26% to 86% [8]. The likelihood of metastasis also increases with time, with common metastatic sites including bones, lungs, and liver. Metastases can spread via the cerebrospinal fluid or hematogenously. The risk of metastasis is greater after 10 years, with 33% of patients showing distant spread, and 64% at 15 years.

4. Conclusion

Hemangiopericytoma of the meninges is a rare and challenging diagnosis that is often mistaken for meningioma due to similar radiological features. However, it is critical to consider HP in the differential diagnosis because of the surgical risks associated with its hemorrhagic nature. Imaging alone is insufficient for definitive diagnosis, and histopathological confirmation, aided by immunohistochemical staining, is essential. Treatment typically involves surgical resection followed by radiotherapy, which significantly reduces recurrence rates and improves survival. Due to the high recurrence rate and delayed metastasis, long-term follow-up is essential for these patients.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Bayley, P., Cushing, H. and Eisenhardt, L. (1928) Angioblastic Meningiomas. *Archives of Pathology & Laboratory Medicine*, **6**, 953-990.

[2] Stout, A.P. and Murray, M.R. (1942) Hemangiopericytoma a Vascular Tumor Featuring Zimmermann's Pericytes. *Annals of Surgery*, **116**, 26-33. https://doi.org/10.1097/00000658-194207000-00004

[3] Akiyama, M., Sakai, H., Onoue, H., Miyazaki, Y. and Abe, T. (2004) Imaging Intracranial Haemangiopericytomas: Study of Seven Cases. *Neuroradiology*, **46**, 194-197. https://doi.org/10.1007/s00234-003-1157-z

[4] Bouvier-Labit, C., Liprandi, A., Piercecchi, M.D., Hosseini, H., Henin, D. and Figarella-Branger, D. (2000) Apport de l'immunohistochimie et de la microscopie électronique dans le diagnostic des hémangiopéricytomes méningés: À propos de 15 cas. *Annales de Pathologie*, **20**, 492-498.

[5] Jalali, R., Srinivas, C., Nadkarni, T.D. and Rajasekharan, P. (2008) Suprasellar Haemangiopericytoma—Challenges in Diagnosis and Treatment. *Acta Neurochirurgica*, **150**, 67-71. https://doi.org/10.1007/s00701-007-1474-9

[6] Sheehan, J., Kondziolka, D., Flickinger, J. and Lunsford, L.D. (2002) Radiosurgery for Treatment of Recurrent Intracranial Hemangiopericytomas. *Neurosurgery*, **51**, 905-911. https://doi.org/10.1227/00006123-200210000-00008

[7] Kim, J.H., Jung, H., Kim, Y.U., Kim, C.J., Hwang, S., Paek, S.H.A., *et al.* (2003) Meningeal Hemangiopericytomas: Long-Term Outcome and Biological Behaviour. *Surgical Neurology*, **59**, 47-53. https://doi.org/10.1016/s0090-3019(02)00917-5

[8] Guthrie, B.L., Ebersold, M.J., Scheithauer, B.W. and Shaw, E.G. (1989) Meningeal Hemangiopericytoma: Histopathological Features, Treatment, and Long-Term Follow-Up of 44 Cases. *Neurosurgery*, **25**, 514-522. https://doi.org/10.1227/00006123-198910000-00003