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Image Report

A rare case of a right infratentorial meningioma and a left giant posterior communicating thrombosed aneurysm

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ABSTRACT

Background: Giant intracranial aneurysms cause symptoms due to mass effect and can mimic other lesions in imaging studies. The coexistence of tumors and aneurysms is relatively rare, with meningiomas being the predominant tumors found in such cases. The relationship between these two entities is complex and represent a neurosurgical challenge.

Case Description: A 61-year-old woman presented with intermittent headache, vertigo, right peripheral facial palsy, hearing loss, and left hemiparesis. Magnetic resonance imaging revealed two lesions: a supratentorial paraclinoid lesion in the left frontotemporal region and a right infratentorial extra-axial mass, suggestive of a meningioma. The patient underwent a two-staged surgical intervention to address both lesions.

Conclusion: In this particular case, the lesions were located on different sides and in different cranial compartments, making it even rarer.

Keywords: Aneurysm, Concomitant, Giant, Meningioma

INTRODUCTION

The co-occurrence of tumors and aneurysms has been documented with an incidence rate of 0.7 to 7.0%. Meningiomas are the predominant tumors found in such cases.[1] Others, such as pituitary adenomas, gliomas, vestibular schwannomas, lipomas, metastatic tumors, dermoid cyst, and epidermoid cyst have also been reported, although with a lower frequency. These findings suggest a complex relationship between tumors and aneurysms that warrants further research.[6,11] Herein, we present a rare case of a female patient harboring two giant lesions, located in different intracranial compartments.

CASE REPORT

A 61-year-old woman presented with an 8-month history of intermittent headache, vertigo, right peripheral facial palsy, and left hemiparesis. Neurologic examination revealed right sensorineural

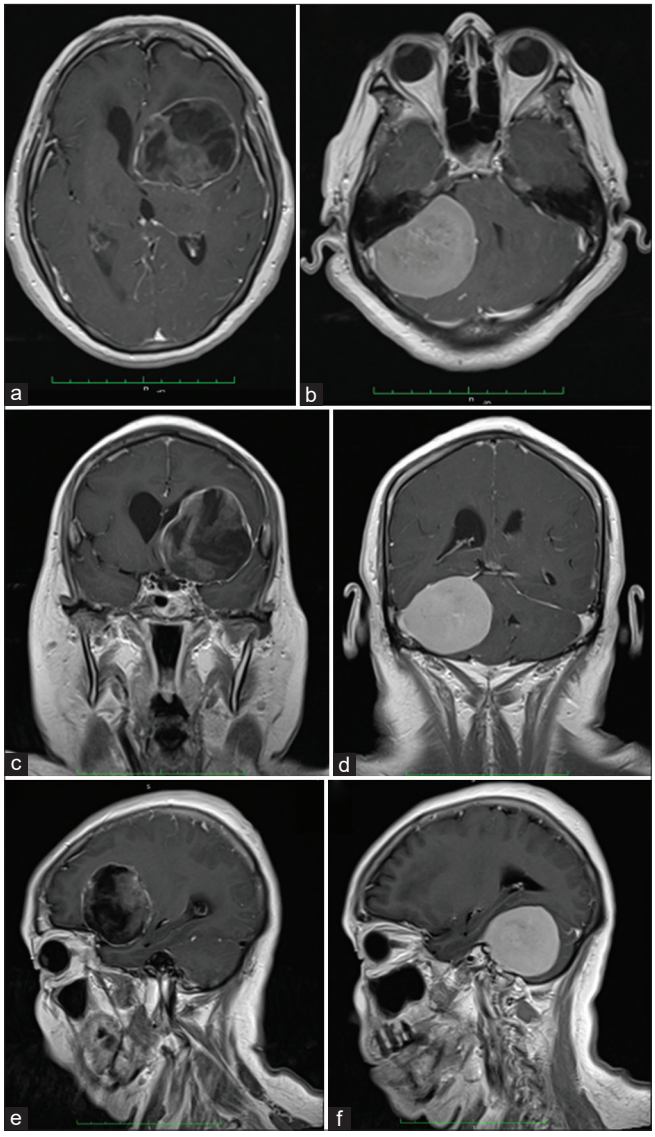

Figure 1: T1 weighted image with contrast magnetic resonance imaging (MRI) (a) axial, (b) coronal, and (c) sagittal planes revealed a left sided frontal mass, with a heterogeneously enhancing central content along with a peripherally enhancing component. The lesion measured 48 × 60 × 55 mm in the rostro-caudal, dorso-ventral, and latero-lateral directions, respectively, and seems to be external to the brain parenchyma. It extends upward into the left lateral ventricle, exerting mass effect, and displacing it medially. The heterogeneously enhancing center is compatible with a flow void sign, which, when associated with an internal enhancement, is suggestive of partial lumen patency, in the context of a giant internal carotid artery (ICA) aneurysm. The peripheral enhancement is consistent with the aneurysmatic arterial wall. (d) Axial, (e) coronal, and (f) sagittal planes revealed a right sided, homogeneously enhancing solid extra axial mass, suggestive of a meningioma, arising from the lateral outer tentorial ring and extending downward to the infratentorial space and medially indenting the pons and right.

hearing loss. Magnetic resonance imaging (MRI) revealed two lesions: a supratentorial paraclinoid lesion that occupied the left frontotemporal region and a right infratentorial solid extra axial mass, suggestive of a tentorial meningioma [Figures 1 and 2]. The patient underwent a two-phased surgical intervention, to approach both lesions.

Meningiomas are common and mostly benign tumors arising from the arachnoid cap cells, they represent 15% of all intracranial tumors and are more prevalent in aging women.[10] Tentorial meningiomas of the posterior fossa, however, represent 3–5% of all meningiomas.[5] These lesions tend to have an indolent course and are lately diagnosed.[2] Resection must be performed and complete excision pursued. There is a risk of local recurrence, depending on the extent of resection. The most common cause of recurrence is due to invasion of the dural venous sinuses.[13] Differential diagnosis includes epidermoid cyst, chondroma, chordoma, and sarcomas.[12] This lesion was initially approached in the first stage through a right paramedian suboccipital craniotomy, with no further complications, achieving gross total resection.

The giant posterior communicating aneurysm was initially misdiagnosed as a cavernoma due to its popcorn-like appearance and a low-signal intensity rim on MRI. However, various substances such as methemoglobin, melanin, lipid, protein, calcium, iron, copper, and manganese can cause intrinsically high-signal intensity on T1 weighted image (T1WI).[8] The presence of a hyperintense halo around the lesion on T1WI is a useful finding to differentiate cavernous malformations from hemorrhagic tumors and other intracranial hemorrhages such as giant aneurysms,[16] which are those with a diameter >2.5 cm and often present as large intracranial lesions causing signs and symptoms due to the mass effect.[14] The reported incidence of aneurysms presenting as mass lesions rather than subarachnoid hemorrhage is rare and has also been reported to mimic arteriovenous malformations and brain tumors in imaging studies.[3,4] This lesion was treated through a left pterional approach, through which the aneurysmal dome was resected and, as clipping was not deemed possible due to a wide neck, *en bloc* resection, with the remodeling of the parental internal carotid artery (ICA) with a termino-terminal anastomosis termino-terminal anastomosis was performed. Unfortunately, due to complications related to cerebral vasospasm, multiple cerebral infarcts occurred and the patient had a fatal outcome.

CONCLUSION

The etiology of coexisting meningiomas and intracranial aneurysms has been the subject of intensive investigation in which various hypotheses suggest that the enhanced regional blood flow resulting from the meningioma may promote aneurysm formation on the feeding artery, as the increased blood supply to the tumor leads to an augmented directional

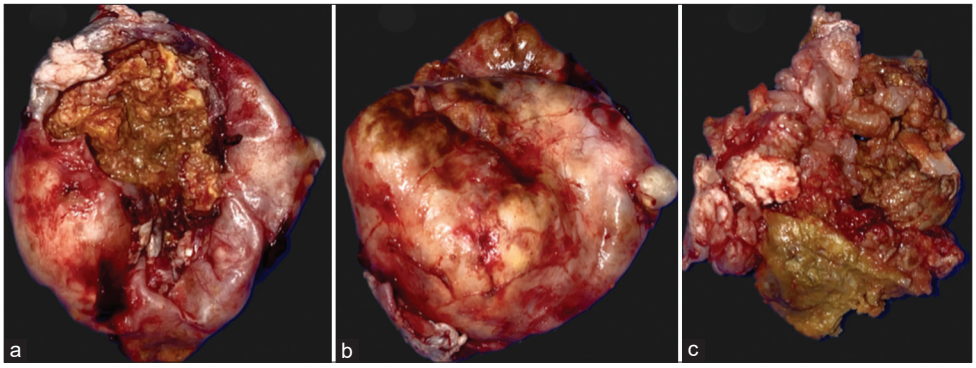

Figure 2: Macroscopic findings. (a-c) An ovoid, extra-axial lesion was found with an adequate dissection plane firmly adhered to blood vessels at the level of the operculoinsular region of the Sylvian fissure. The lesion capsule was opened to access the contents, revealing solid, yellowish material suggestive of cholesterol deposits. Zones of old bleeding were found peripherally to the lesion. During the dissection of the peripheral blood vessel capsule, a solution of continuity of the left internal carotid artery communicating segment occurred, which was suggestive of an aneurysmal neck at that level. The resected lesion was suggestive of a thrombosed giant aneurysm, which ruptured the aneurysmal neck during dissection, despite being repaired with suture there was a high risk of thrombosis and/or extensive cerebral infarction.

blood flow that generates hemodynamic stress on the cerebral arterial walls. Moreover, the pathogenesis of aneurysm formation may involve the action of signaling molecules secreted by the tumor, such as vascular endothelial growth factor and growth hormone-like estrogen.[7,9,15] However, it must be noted that in our patient, the lesions were located on different sides, and even, in different cranial compartments, thus leading to the rarity of this case.

Declaration of patient consent

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

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Conflicts of interest

There are no conflicts of interest.

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

The author(s) confirms 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. Algburi HA, Sharma M, Ismail M, Albulaihed SA, Al-Gertani MR, Majeed SN, *et al*. The coexistence of anterior communicating artery aneurysm and meningioma: A literature review and illustrative case. Surg Neurol Int 2022;13:569.
2. Barrows HS, Harter DH. Tentorial meningiomas. J Neurol Neurosurg Psychiatry 1962;25:40-4.
3. Belec L, Cesaro P, Brugieres P, Gray F. Tumor-simulating giant serpentine aneurysm of the posterior cerebral artery. Surg Neurol 1988;29:210-5.
4. Bose B, Northrup B, Osterholm J. Giant basilar artery aneurysm presenting as a third ventricular tumor. Neurosurgery 1983;13:699-702.
5. Colli BO, Assirati JA Jr., Deriggi DJ, Neder L, Dos Santos AC, Carlotti CG Jr. Tentorial meningiomas: Follow-up review. Neurosurg Rev 2008;31:421-30; discussion 430.
6. De Souza MR, Fagundes CF, Rabelo NN, Teixeira MJ, Figueiredo EG. Association between intracranial aneurysm and meningiomas: An integrative survival analysis with identification of prognostic factors. Clin Neurol Neurosurg 2020;198:106128.
7. Fischer BR, Palkovic S, Holling M, Niederstadt T, Jeibmann A, Wassmann H. Coexistence of cerebral aneurysm and meningioma--pure accident? Clin Neurol Neurosurg 2009;111:647-54.
8. Ginat DT, Meyers SP. Intracranial lesions with high signal intensity on T1-weighted MR images: Differential diagnosis. Radiographics 2012;32:499-516.
9. Kim YH, Lee YJ, Han JH, Ahn S, Lee J, Kim JH, *et al*. Association of intracranial aneurysms and meningiomas: A case-control study. J Neurosurg 2015;123:357-61.
10. Marosi C, Hassler M, Roessler K, Reni M, Sant M, Mazza E, *et al*. Meningioma. Crit Rev Oncol Hematol 2008;67:153-71.
11. Pia HW, Obrador S, Martin JG. Association of brain tumours and arterial intracranial aneurysms. Acta Neurochir (Wien) 1972;27:189-204.
12. Ploncard P. Differential diagnosis for posterior cerebral fossa meningiomas. Neurochirurgie 1972;18:57-64.

13. Simpson D. The recurrence of intracranial meningiomas after surgical treatment. J Neurol Neurosurg Psychiatry 1957;20:22-39.
14. Smith KA, Kraus GE, Johnson BA, Spetzler RF. Giant posterior communicating artery aneurysm presenting as third ventricle mass with obstructive hydrocephalus: Case report. J Neurosurg 1994;81:299-303.
15. Tachikawa T, Adachi J, Nishikawa R, Matsutani M. An anterior ethmoidal artery aneurysm associated with an olfactory groove meningioma: Case illustration. J Neurosurg 2002;97:1479.
16. Yun TJ, Na DG, Kwon BJ, Rho HG, Park SH, Suh YL, *et al.* A T1 hyperintense perilesional signal aids in the differentiation of a cavernous angioma from other hemorrhagic masses. AJNR Am J Neuroradiol 2008;29:494-500.

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