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Case Report

Meningiomas of the parieto-occipital convexity mimicking a hematoma: A case report in a third-world country

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ABSTRACT

Background: Meningiomas are benign, slow-growing tumors of the central nervous system (CNS) that arise from the arachnoid matter. It comprises one of the most common primary tumors of the CNS, occurring mostly in and after the fifth decade of life with a female gender predilection. Diagnosis is facilitated by imaging computed tomography (CT) or magnetic resonance imaging (MRI); however, atypical forms exist which augments the risk of missing the diagnosis. This is a case of a meningioma that mimics a hematoma on imaging, the diagnosis of which was only confirmed following histopathology.

Case Description: A 36-year-old patient presented with a 9-month history of intermittent moderate-intensity headaches associated with photophobia, tinnitus, and dizziness. There was no previous history of trauma. There were no focal neurological deficits on examination. Both contrast-enhanced and noncontrast-enhanced brain CT scans showed features suggestive of an intraparenchymal hematoma. She had a control CT scan 2 months and 9 months later due to the persistence of symptoms despite remaining stationary, which revealed no changes in the lesion as seen in the previous CT scans. The patient did not benefit from an MRI scan due to the socioeconomic status of the country and the patient herself. A decision to operate was made, and the sample was sent for histopathology. Histopathology confirmed the lesion to be a psammomatous meningioma.

Conclusion: Although CT findings of meningiomas are quite often typical, it is important to note that atypical forms exist as well. Knowledge of the atypical forms, such as lesions that look like an intraparenchymal hemorrhage initially but remain unchanged over a period of time, would decrease the risk of missing the diagnosis in such instances.

Keywords: Brain, Hemorrhage, Hematoma, Meningioma, Tomography

INTRODUCTION

Meningiomas are central nervous system (CNS) tumors, generally benign, arising from arachnoid cells located on the inner surface of the dura mater. They usually appear after the age of 50 and affect women predominantly with a sex ratio of 2:1.[2] Ionizing radiation has been retained as a clear risk factor for the occurrence of a meningioma, although prolonged exposure to synthetic progestins is a current subject.[1,3] Considering the most common primary tumor of the CNS,

they pose few diagnostic problems; diagnosis is facilitated by magnetic resonance imaging (MRI), which in no way takes away from the contribution that brain computed tomography (CT) scan can provide, especially in our developing countries where many patients have financial concerns. The diagnosis of meningiomas is most often fortuitous on imaging (CT scan and MRI), and they can present in atypical forms such as cystic, hemorrhagic, or metaplastic transformations, which can lead to diagnostic errors.[4]

We hereby report a case of a meningioma with an atypical presentation on imaging, where we discuss the clinical presentation, imaging, and treatment of these tumors.

CASE DESCRIPTION

This is a 36-year-old female patient with no reported personal or family medical history. In February 2022, she was seen in the emergency department for headaches of moderate intensity lasting for 9 months, associated with photophobia, tinnitus, and dizziness. There was a notion of loss of consciousness which was not well documented. However, there was no reported history of vomiting, visual disturbances nor weakness of the limbs. There was no previous history of trauma. On examination, she had a Glasgow Coma Scale of 15/15, and her pupils were isochoric and reactive to light. There were no motor deficits, cranial nerve palsies, or sensory disturbances.

She came with a brain CT scan (both contrast enhanced and noncontrast enhanced) [Figures 1-3] done a month before the presentation, which showed a spontaneously hyperdense, right parieto-occipital, homogeneous image, measuring 55 × 35 mm, surrounded by a fine edematous border, compressing the ipsilateral ventricle which suggested an acute intraparenchymal hematoma. The patient was boarded on medical treatment based on level II analgesics according to the World Health Organization (WHO) classification of analgesics.

A control CT scan was done 2 months after the initial visit which showed the same lesion as seen earlier while the clinical picture remains static. Another CT scan was done seven months later [Figure 4], which still showed the same lesion, at which point a decision for a craniotomy was made. The indication for surgery was based on the persistence of symptoms, and the headache was quite disabling, along with the fact that the density of the lesion that was thought to be a hematoma remained unchanged after 9 months, whereas

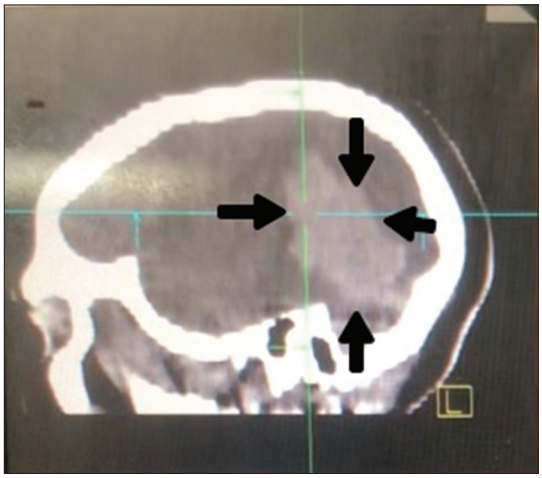

Figure 2: Computed tomography scan at initial visit: Noncontrast enhanced, parenchymal window: Sagittal view. Arrows showing the spontaneous hyperdense lesion in the right parieto-occipital region.

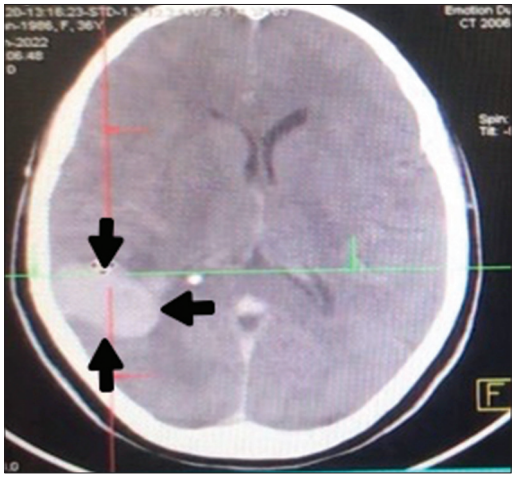

Figure 1: Computed tomography scan at initial visit: Noncontrast enhanced, parenchymal window: Axial view. Arrows pointing to the same lesion on a contrast enhanced CT scan.

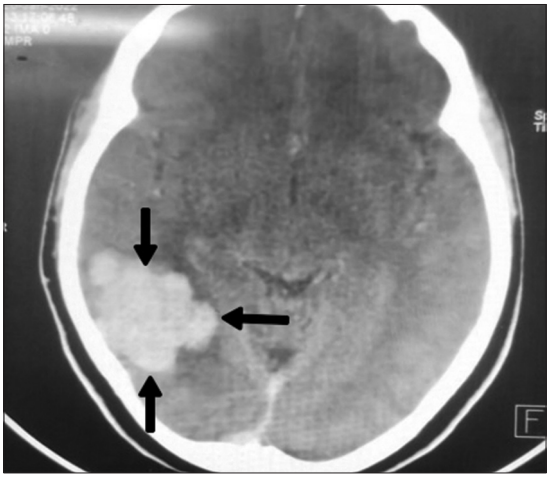

Figure 3: Computed tomography scan at initial visit: Contrast enhanced, parenchymal window: Axial view. Arrows pointing to the same lesion on a contrast enhanced CT scan.

the density of hematomas is expected to change as they age. Hence, a decision was made to explore.

The patient did not benefit from an MRI scan, which may have facilitated the diagnosis and, hence, the realization of an early excision for the following reasons: first, the country, being a third-world country, had only one MRI scanner and at the time had a breakdown and had been so for a little over a year. Second, the patient's financial status did not allow her to be able to travel out of the country to do the MRI scan.

To the time of writing this article, there was only one Neurosurgeon in the entire country, this explains the irregular follow-up of the patient pre-operatively. This coupled with the fact that during the period of follow-up for this patient, he was also appointed as the head of the department for surgery, thereby complicating matters by increasing his engagements and hence decreasing his clinical work time.

A right parieto-occipital craniotomy was realized, making it possible to perform a Simpson 1 excision. There were no intra-operative complications, the tumor was removed bloc, and the recovery from anesthesia was smooth. The lesion was pearly white, of firm consistency, hemorrhagic [Figure 5] with a clear cleavage plane, and developed from the tentorium cerebelli. Histopathology was in favor of a psammomatous meningioma.

The postoperative course was unremarkable, with no neurological deficits, and the patient was placed

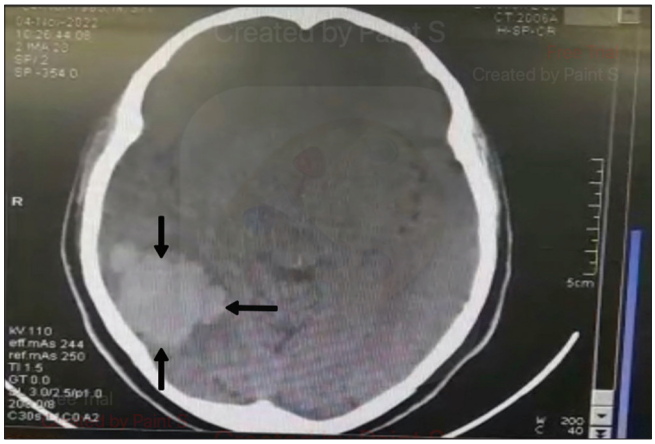

Figure 4: Control noncontrast-enhanced computed tomography scan, parenchymal window: Axial view, 9 months after initial visit. Arrows showing the same hyperdense lesion seen on initial CT scans.

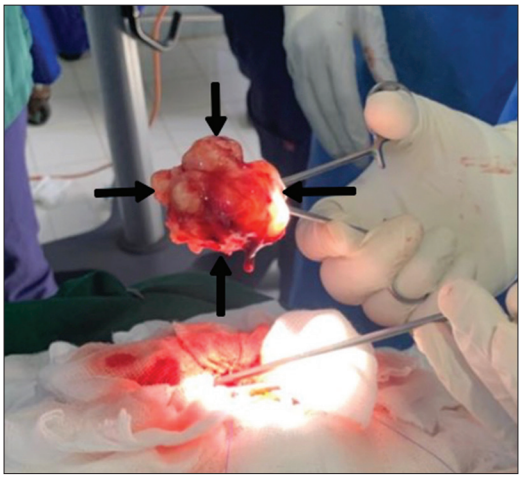

Figure 5: Intra-operative image of the lesion. Arrows showing the excised lesion en bloc.

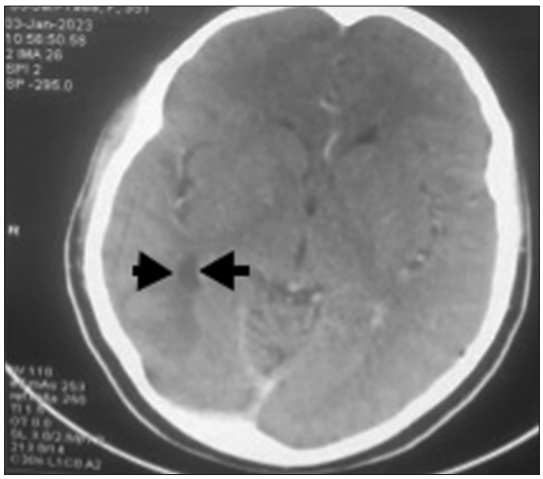

Figure 6: Postoperative contrast-enhanced computed tomography scan, parenchymal window: Axial view. Arrows showing initial lesion site which is now free of the lesion

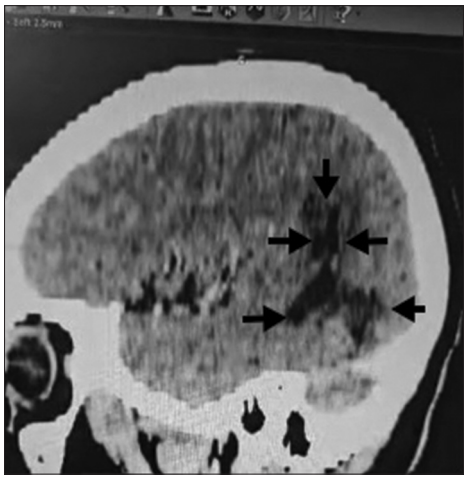

Figure 7: Postoperative contrast-enhanced computed tomography scan, parenchymal window: Sagittal view. Arrows showing initial lesion site which is now free of the lesion.

on preventive antiepileptic and analgesic treatment. A postoperative contrast-enhanced CT scan was done and shown in Figures 6 and 7. At week 2 postoperative follow-up, the headaches had improved markedly, only coming on occasionally. Follow-up at month 2 post-surgery was unremarkable. At 6-month follow-up, however, the patient had complained of visual disturbances for which she was seen by ophthalmologists and was put on prescription glasses. At one year follow up, no new complains, and as long as she wore her prescription grasses she had no visual disturbances.

DISCUSSION

Meningiomas are classified into three grades with 15 subtypes according to the 5th edition of the WHO classification of tumors of the nervous system. These subtypes combine histological and molecular criteria (SMARCE1, BAP1, KLF4/TRAF7, and CDKN2A/B), making it possible to define the anaplastic or atypical character of meningiomas.[13] Histologically, meningiomas represent 37.6% of all primary tumors of the CNS and 53.3% of all benign tumors of the CNS.

Their incidence increases with age, with a median age of diagnosis estimated at 66 years.[14] A study carried out in South Africa showed the predominance of meningiomas in black female subjects with a sex ratio of 3:2.[13] The clinical symptomatology of meningiomas is atypical, depending on their topography of development compressed adjacent neurological or vascular structures. According to Boetto *et al*., headaches are the most frequent symptom of meningiomas, found in 33.3–36.7%.[1] Therefore, according to N'dri Oka *et al*., the presence of persistent headaches should lead to a brain scan to look for a space-occupying lesion.[13] Nonetheless, in most low- and middle-income countries, late presentation due to low education, seeking traditional treatment first, lack of accessibility, and availability of neurosurgical services in nearby facilities is a common feature.[12,15]

The diagnostic suspicion of meningiomas is most often high on the basis of characteristic imaging with a globular, homogeneous, circumscribed, well-enhanced mass of extra-axial location.[4] The CT appearance of meningiomas is usually isodense in relation to the cortex but can appear hyperdense or slightly hypodense.[14]

However, even grade I meningiomas can present atypical imaging features such as hemorrhage, cyst, or metaplastic transformation that can be misleading.[4] The presence of hemorrhage in an extra-axial mass should raise fear of an atypical meningioma or another diagnosis, and this hemorrhage, reported in 1.3–2.4% of cases, can be intertumoral, subdural, subarachnoid, or intraparenchymal, which may be due to trauma or anticoagulant treatment.[4] The radiologist, as well as the neurosurgeon must be aware of these less common imaging features to avoid diagnostic wandering.

Our clinical case corresponds to a spontaneously hyperdense meningioma on CT, reminiscent of a hematoma, whose histopathology is in favor of a psammomatous meningioma. This benign histological subtype is rare, representing approximately 1.05–3.84% of all intracranial meningiomas.[11] On imaging, foci of calcifications are frequently found containing large psammomas made essentially of concentric calcic materials.[11]

MRI combined with spectroscopy can help confirm the diagnosis by showing an alanine peak at 1.48 ppm specific for meningiomas and high contrast on perfusion imaging.[4]

Unfortunately, our patient did not benefit from an MRI, and this was one of the barriers to making an early diagnosis. In fact, a study looking at barriers to neurosurgical care of brain tumors in low- and middle-income countries showed delays in neuroimaging as well as a lack of advanced diagnostic facilities as some of the barriers.[18] In addition, the lack of biomedical engineers and regular maintenance checks leads to most of the medical equipment being unusable.[18] This is true for our case, as our patient benefited from a CT scan but could not do an MRI as the only MRI in the country had a breakdown and had been so for almost a year due to a lack of qualified biomedical engineers. Furthermore, our patient could not afford traveling abroad for an MRI. A study in Nigeria, a middle-income country, suggests that CT and MRI scans are unaffordable for most people.[12]

As for that which concerns the management of spontaneous supratentorial hematomas, evidence suggests no benefit of early evacuation of the hematoma through craniotomy as compared to conservative management pertaining to functional outcomes or mortality.[5,6] As a result, in our case, which was initially thought to be a hematoma with a supratentorial location, conservative management was employed initially.

However, in the case of a large hematoma, with mass effect and midline shift causing disturbances in the level of consciousness, then there is an indication for craniotomy and evacuation as a lifesaving procedure.[6]

Minimally invasive techniques for evacuation of hematomas were suggested by some studies to have prospects for better outcomes when compared to conservative management;[5] however, a few randomized trials showed no significant superiority of the former over the latter with regard to neurological outcomes and mortality.[6] Furthermore, such techniques are yet to be common day practice in some, if not most, developing countries.

As for infratentorial hematomas, where there is a high risk for brain stem compression, early evacuation is recommended, and indications include hematomas >3 cm, signs of brain stem compression, or evidence of hydrocephalus.[5,6]

The treatment of a meningioma is decided on a case-by-case basis and includes the following modalities: radio-clinical monitoring, surgical excision, conventional or stereotactic radiotherapy, and, more rarely, chemotherapy.[1] Conservative treatment can be observed for meningiomas of 2–3 cm, asymptomatic, and discovered incidentally.[3] This is, however, not the most common treatment option in our practice, as even those patients who are symptomatic usually present late. Hence, surgical excision remains the main treatment option for most of our patients. Surgical excision of meningiomas as complete as possible is so far the most efficacious treatment option.[10] In more developed countries, patients may benefit from embolization before resection to minimize blood loss and facilitate resection.[9,16] This is not the case in our experience, as we do not have the facility or equipment. A report on the management of meningiomas in Nepal, another low-income country, suggests the lack of facilities for embolization.[15] Despite the lack of embolization service in most low- and middle-income countries, the outcome of surgical excision of meningiomas is generally satisfactory.[12,15] Nevertheless, the planning of surgeries may be delayed, as is seen in our case, due to the lack of advanced imaging difficulty in accessing neurosurgical care as there was only one neurosurgeon in the country at the time of managing this patient; these are reported as some of the barriers to neurosurgical care in most low- and middle-income countries.[18]

Adjuvant radiotherapy is a treatment option for recurrent and inoperable tumors [12] howbeit, stereotactic radiosurgery remains only a dream for most low- and middle-income countries as we lack the facility and infrastructure. A study assessing the availability of the services in Africa showed that the vast majority of African countries lack the equipment needed.[8] This is especially true for us, as we do not even have a center for conventional radiotherapy. Hence, those who need such services would have to travel out of the country.

Chemotherapy has a limited role in the treatment of meningiomas both in Africa and at large; studies suggest no benefit of chemotherapy in the treatment of refractory or recurrent meningiomas.[7,17] A small number of studies suggested some efficacy of chemotherapy in the treatment of the more aggressive forms of meningiomas; however, these studies are reported to have significant limitations.[7] We have never used chemotherapy in the treatment of meningiomas in our practice.

CONCLUSION

CT imaging of meningiomas is most often typical; however, less common features, such as a simple, spontaneous hyperdense appearance suggestive of hemorrhage, may be present and wrongly suggest another diagnosis. MRI, combined with spectroscopy, can help correct the diagnosis and avoid errors. However, in our context of developing countries where this examination is not always at hand, knowledge of these particular atypical imaging characteristics is necessary for any practitioner.

Ethical Approval

Institutional Review Board approval is not required.

Declaration of patient consent

Patient's consent not required as patients 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 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. Boetto J, Birzu C, Kalamarides M, Peyre M, Sanson M. Meningiomas: Update on current knowledge. Rev Med Interne 2021;43:98-105.
2. Brada GB, Ferszt R, Kendall BE. Les méningiomes intracrâniens: Diagnostic - biologie - thérapeutique. Paris: Springer; 1991.
3. Corniola M, Lobrinus J, Lemée JM, Meling T. Intracranial meningiomas: Patient care in the neurosurgical era. Rev Med Suisse 2020;16:283-8.
4. Damalcheruvu PR, Mian M, Sharma S, Patro S, Vattoth S, Viswamitra S. Meningioma or mimic: Look twice and save a life. Neurographics 2022;12:216-32.
5. Dastur CK, Yu W. Current management of spontaneous intracerebral haemorrhage. Stroke Vasc Neurol 2017;2:21-9.
6. De Oliveira Manoel AL. Surgery for spontaneous intracerebral hemorrhage. Crit Care 2020;24:45.
7. Drappatz J. How useful is chemotherapy for atypical and anaplastic meningiomas? Expert Opin Pharmacother 2022;23:1559-61.
8. Fiagbedzi E, Hasford F, Tagoe S, Nisbet A. Radiotherapy infrastructure for brain metastasis treatment in Africa: Practical guildelines for implementation of a stereotactic radiosurgery (SRS) program. Health Technol (Berl) 2023;13:893-904.
9. Kominami S, Watanabe A, Suzuki M, Mizunari T, Kobayashi S, Teramoto A. Preoperative embolization of meningiomas with

N-butyl cyanoacrylate. Interv Neuroradiol 2012;18:133-9.
10. Kyritsis AP. Chemotherapy for meningiomas. J Neurooncol 1996;29:269-72.
11. Lin Z, Zhao M, Ren X, Wang J, Li Z, Chen X, *et al*. Clinical features, radiologic findings, and surgical outcomes of 65 intracranial psammomatous meningiomas. World Neurosurg 2017;100:395-406.
12. Mezue W, Ndubuisi C, Ohaegbulam S, Achebe D, Chikani M. Management of intracranial meningiomas in Enugu, Nigeria. Surg Neurol Int 2012;3:110.
13. N'Dri Oka D, Broalet Maman YE, Kakou M, Broalet P, Haidara A, Boni N'guessan R, *et al*. Intracranial meningiomas in the ivorian environment: Study of a surgical series. Afr J Neurol Sci 2008;27:31-5.
14. Ogasawara C, Philbrick BD, Adamson DC. Meningioma: A review of epidemiology, pathology, diagnosis, treatment, and future directions. Biomedicines 2021;9:319.
15. Raman SG, Prakash P, Sumit J, Bikram SD, Prasanna K. Clinical outcome and recurrence after meningioma surgery: An experience from a developing country, Nepal. World Neurosurg 2021;148:e138-44.
16. Shah A, Choudhri O, Jung H, Li G. Preoperative endovascular embolization of meningiomas: Update on therapeutic options. Neurosurg Focus 2015;38:E7.
17. Shahbandi A, Shah DS, Hadley CC, Patel AJ. The role of pharmacotherapy in treatment of meningioma: A systematic review. Cancers (Basel) 2023;15:483.
18. Shakir M, Shariq SF, Irshad HA, Khowaja AH, Tahir I, Rae AI, *et al*. Barriers to neurosurgical care of brain tumors in low- and middle-income countries: A systematic review of the service delivery challenges. World Neurosurg 2024;187:211-22.e3.

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