

Clinical and imaging characteristics of intracranial meningioma in the elderly: Case report

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INTRODUCTION

Meningiomas, the most common primary intracranial tumors, originate in the cranospinal meninges, and are generally benign and slow-growing. This characteristic often allows for a complete and potentially curative surgical resection, thanks to the cleavage plane between the tumor area and normal brain tissue (BUERKI et al., 2018; SOUTO et al., 2002; MAGGIO et al., 2021).

These tumors predominate in adults, representing about one third of all intracranial neoplasms, being the most frequent of the central nervous system (CNS) (OSTROM et al., 2019). Commonly benign, these tumors arise from meningothelial cells (arachnoids), considered as "cap" cells of the arachnoid in which their cellular concentration in the arachnoid granulations, along the dural venous sinuses, contributes directly to their origin, and are also found associated with cranial nerves and the choroid plexus (HUNTOON; TOLAND; DAHIYA, 2020; OGASAWARA; PHILBRICK; ADAMSON, 2021).

The management of meningiomas in the elderly is an additional challenge in contemporary medicine. As a result, it is important to consider the complexity of the decision between traditional surgical resection and other therapeutic strategies in this population group, given that the physiology of aging and comorbidities strongly increase the risk of surgical complications, requiring a personalized approach to patients in these conditions (POON et al., 2014).

The distinction between benign meningiomas and malignant dedifferentiations is crucial in the treatment of these intracranial tumors. Complete surgical resection, which is often possible in benign meningiomas, contrasts with the more aggressive approach required for malignant forms, evidencing the importance of accurate classification to guide the best therapeutic choice for the patient (SOUTO et al., 2002; BUERKI et al., 2018; MAGGIO et al., 2021).

The prevalence of meningiomas increases with age, presenting demographic factors, such as prevalence in women and black population for non-malignant meningiomas (ACHEY et al., 2019).

In summary, the treatment of meningiomas in the elderly requires a careful evaluation, considering the physiology of aging, comorbidities, tumor classification, and demographic characteristics. This personalized approach aims to optimize clinical outcomes and preserve quality of life, recognizing the

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clinical and epidemiological nuances of these intracranial neoplasms (SOUTO et al., 2002; POON et al., 2014; BUERKI et al., 2018; ACHEY et al., 2019; MAGGIO et al., 2021).

Thus, this study aims to report a case of meningioma in an elderly patient, addressing its possible causes and discussing the associated clinical implications.

CASE REPORT

MEDICAL HISTORY

An 80-year-old female patient, brown, retired, living in the rural area of a city in the interior of Paraíba, was admitted to the hospital in mid-February 2024, was evaluated and underwent an imaging exam, including cranial computed tomography (CT) at the service itself, after being referred from a private cardiology outpatient clinic in order to rule out stroke involvement.

In view of the anamnesis, it was found that the patient had the following comorbidities: decompensated congestive heart failure (CHF), atrial fibrillation (AF), peripheral venous insufficiency, systemic arterial hypertension (SAH), hypothyroidism, dyslipidemia, and dyspnea at rest, in addition to orthopnea.

PHYSICAL EXAMINATION

At the time of the physical examination, the patient was conscious, but disoriented and had intense headache for consecutive days, according to the companion's report. During cardiac and pulmonary auscultation, an irregular heart rhythm was identified, considering tachycardia without murmurs. At the lung level, abnormal and discontinuous sounds were identified, characterizing rales at the base of the right hemithorax. The capillary refill time (TEC) was < 3 seconds. On abdominal examination, the patient reported pain on palpation and a flaccid abdomen was also observed.

CARDIOLOGICAL IMAGING TESTS

The echocardiogram (ECHO) found that the left ventricular ejection fraction corresponded to 27%, thus it is classified as a reduced ejection fraction, a factor that is also used to confirm CHF.

NEUROLOGICAL IMAGING

As mentioned above, the initial examination was cranial CT, using the axial section technique without the intravenous administration of water-soluble iodinated contrast. The report describes a lobulated, calcified extra-axial expansive formation with a dural implantation base located in the sagittal region of the right frontal convexity in close contact with the interhemispheric sickle, measuring approximately 5.6 cm x 5.0 cm x 3.2 cm (Figs 1 and 2). The lesion determines compression on the adjacent brain parenchyma, and

the main diagnostic hypothesis should be considered: atypical neoplasm of the meningotheial lining (meningioma).

In addition, it was also found that the Turkish saddle is enlarged, measuring 2.1 cm x 2.2 cm x 1.6 cm, filled with cerebrospinal fluid and with compression of the pituitary tissue against the sellar floor. The skullcap does not show significant changes, accentuation of cortical sulci and cerebral fissures.

In addition, the ectasia of the supratentorial ventricular system did not show signs of cerebrospinal fluid transudation. The IV ventricle presented usual morphology and situation, hypoatenuation of the periventricular white matter, radiated crowns, and semioval centers, suggesting microangiopathy.

The remainder of the brain parenchyma and posterior fossa structures with usual attenuation coefficients are within the proposed protocol. The center-median structures have no deviations from the midline. Absence of extra-axial collections and parietal calcifications in the internal carotid arteries and vertebrobasilar system.

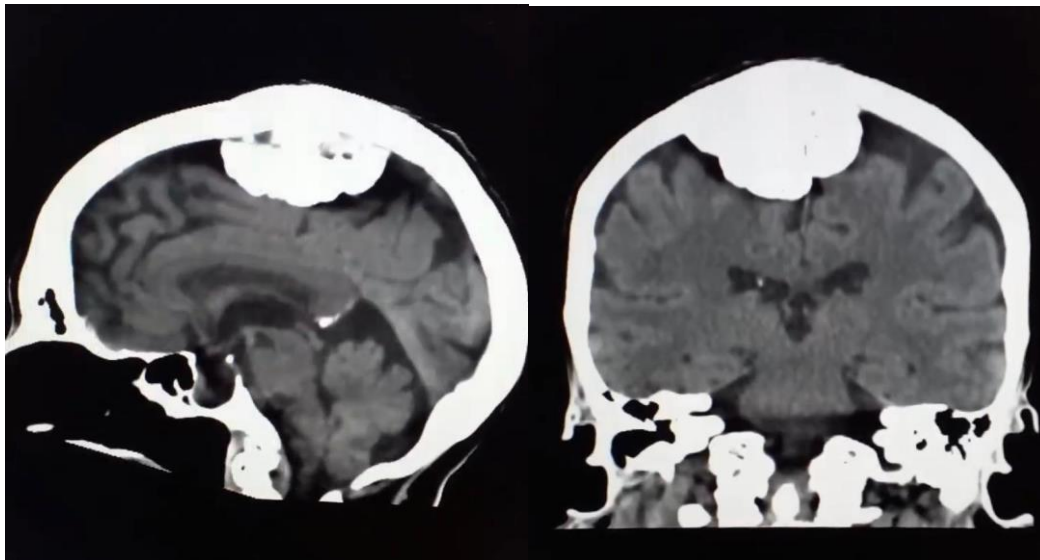


Fig 1. Cranial tomography identifying lobulated formation with dural implantation base located in the sagittal region.

Fig 2. Meningioma in close contact with interhemispheric sickle

DISCUSSION

Although she was diagnosed at the age of 80, it is possible that the appearance of the tumor in the patient began within the most common age group, since this pathology is of slow development and the patient reported severe headache, leading to disorientation for consecutive days, common symptoms in this condition.

Usually, these tumors have a slow growth rate and may manifest with focal neurological symptoms, seizure (generalized or partial), and increased intracranial pressure, which can cause headache (MAGGIO et al., 2021).



In the case study reported, imaging tests such as CT were used to diagnose the tumor, assess the degree of involvement, and the involvement of adjacent structures. Although, like the health service, which was referred does not offer neurosurgical procedures or more detailed exams such as an angioresonance, the patient was referred to a more complex service in another city in Paraíba. Generally, magnetic resonance angiography, CT, and magnetic resonance imaging are the main tests used for the diagnosis and evaluation of meningiomas, including even foramen magnum meningiomas – MFM (GOLDBRUNNER et al., 2021; PAUN et al., 2021).

The patient's tumor, identified in the neuroimaging performed, was present in the sagittal region of the right frontal convexity in contact with the interhemispheric sickle, the tumor is well delimited with apparent homogeneity in its composition, with no evidence of extra-axial collections and parietal calcifications in the internal carotid arteries and vertebrobasilar system.

The most commonly used treatment for meningiomas, including the subtype addressed, is surgery, however, in some cases radiotherapy and radiosurgery can be used as substitutes or adjuvants, especially in patients with worse health, advanced age, or in cases where only partial tumor resection is possible (AKYOLDAS et al., 2020; FATIMA et al., 2021).

The RANO 2015 study (ROGERS et al., 2015) evaluated publications carried out between 2000 and 2013 on the clinical evolution of 923 patients treated with surgery or radiosurgery in meningiomas, showing that the degree of resection can be identified as an important prognostic factor in WHO Grade I tumors (much rarer lesions, about 3% of newly diagnosed meningiomas, also called anaplastic or malignant and have a mean global survival of about two to three years and poor local control) (FERRAGUT et al., 2014) and that, in these cases, complete resection is achieved in about more than 95% of the cases of localization in the convexity (ROGERS et al., 2015).

Meningiomas located in the convexity represent a clear surgical indication, because in addition to safe resection, radiosurgery at this site is related to higher complication rates (ALVERNIA et al., 2011; MARTÍNEZ, 2012), especially local edema. Lesions close to the venous sinuses, especially the superior longitudinal sinus, represent a higher surgical risk and less possibility of complete resection. In this group of patients, radiosurgery allows a more conservative surgery, since there is severe morbidity when the Simpson I and II surgical treatment reaches about 20% (SUGHRUE et al., 2011).

In the case of this patient, if a neuroimaging study had been performed early, she could have had a better prognosis, since the tumor would not have reached this magnitude and she would not have been referred to a neurosurgical emergency situation.

CONCLUSION

In summary, the narrative presented in this study highlights the imperative need for agility in the diagnosis of meningioma, especially in the elderly, where vague signs can be mistakenly attributed to the aging



process. As a result, the early introduction of more precise imaging tests, such as magnetic resonance angiography and magnetic resonance imaging, would possibly have allowed early identification, paving the way for less invasive and potentially more effective therapeutic approaches. In addition, the existing demand for comprehensive health services, provided with neurosurgical procedures and advanced exams, underlines the essential accessibility to specialized resources to ensure adequate management of complex conditions, such as meningiomas, in the elderly.

In a second crucial aspect, the importance of continuous follow-up of these elderly patients, particularly those with persistent neurological symptoms, is emphasized, in order to anticipate the diagnosis of brain conditions such as meningiomas. The current scientific literature supports the idea that early interventions, when feasible, not only optimize clinical outcomes, but also reduce the need for invasive emergency procedures. Thus, the promotion of clinical practices that emphasize diligence in the investigation of neurological symptoms in the elderly, together with the availability of advanced diagnostic resources, can contribute substantially to a more effective and compassionate approach to the care of patients with brain tumors, including meningiomas.

Keywords: Meningioma, Computed tomography, Radiosurgery.



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