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Giant right parasagittal and periventricular parietal meningioma in an 86-year-old female patient: a multidisciplinary challenge. Experience of the Neurosurgery Department “Sfântul Andrei” Emergency Clinical Hospital, Constanța, Romania

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ABSTRACT

Meningiomas are the most common intracranial tumors. Given the increase in life expectancy and the widespread access and use of brain imaging, the incidence in the elderly population (≥ 65 years) is continuously increasing. Meningiomas in adults are mainly benign tumors that develop from the meninges. We present the case of an 86-year-old female patient admitted on an emergency basis to our department with severe left-sided hemiparesis (left brachial plegia, severe left crural paresis) of approximately 4 days duration, drowsy, GCS 14 points, Karnofsky score 70, headache of moderate intensity (VAS 5/10). Brain imaging (contrast-enhanced CT scan) revealed a giant cerebral meningioma (60 x 57 x 62 mm) located in the right parietal region, in a parasagittal and paraventricular position. The procedure was performed under magnification, with subtotal resection and a 2–3 mm residual fragment. The postoperative status was very good, with significant improvement of the motor deficit—allowing for effective mobilization with a walker—and a Karnofsky score that reached 90. The headache disappeared.

INTRODUCTION

They are common, accounting for about 18% to 20% of primary intracranial tumors, and they are slow-growing, with a predominance in women². Meningiomas are the most common intracranial tumors, with a prevalence of approximately 97.5/100,000^{3,4}. This estimate is set to increase due to the widespread access to and use of brain imaging.

Keywords

elderly meningioma,
surgery,
complication



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The overall occurrence of meningiomas varies between 5 and 12 new cases per 100,000 person-years in Western populations such as Europe, the UK, and the USA^{3,1}. In individuals aged 65–69 years, incidence rates approximate 25–30 per 100,000, increasing to over 50 per 100,000 among those aged 85 and above^{3,1}.

From a histological standpoint, the vast majority of meningiomas (approximately 80–90%) are classified as WHO Grade I (benign), while 15–20% fall under the atypical Grade II category, and fewer than 5% are considered malignant or anaplastic (Grade III)⁷.

Although more common in women, studies conducted in the United Kingdom⁶ have demonstrated an increasing incidence of intracranial meningiomas with age for both sexes.

The SKALE score—incorporating sex, Karnofsky Performance Status (KPS), tumor location, and presence of edema—offers a more tailored neurosurgical framework. Patients scoring ≥ 8 on SKALE are more likely to benefit from surgical intervention with reduced perioperative morbidity and improved functional recovery⁸.

Different aspects influence the multidisciplinary approach to elderly patients with intracranial meningiomas: first, the general conditions and comorbidities of the patients, determining the independence level; second, the cognitive state, the presence of brain atrophy, and the location and the size of the lesion; and finally, an important aspect linked to hospitalization and intensive care time that should not be overlooked¹. The main comorbidities were hypertension (41.4%), chronic obstructive pulmonary disease (10.2%), atrial fibrillation (9.6%), diabetes (7.7%) and cardiomyopathy (6.2%)¹.

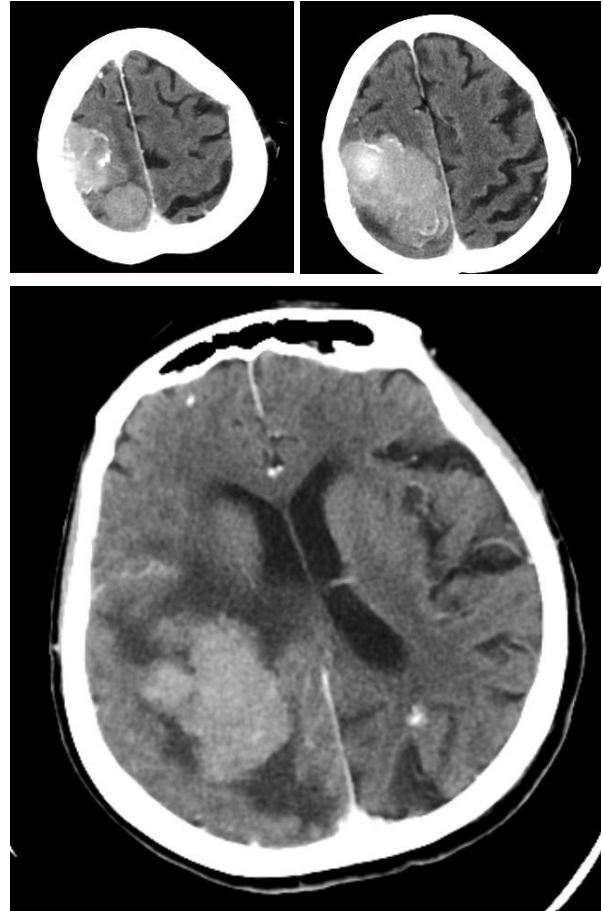
CLINICAL PRESENTATION

We present the case of an 86-year-old female patient admitted on an emergency basis to our department with severe left-sided hemiparesis (left brachial plegia (ASIA 1/5), severe left crural paresis (ASIA 3/5)) of approximately 4 days duration, drowsy, GCS 14 points, Karnofsky score 70, headache of moderate intensity (VAS 5/10).

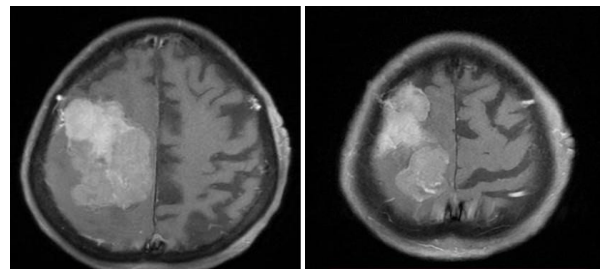
Medical history indicates atrial fibrillation (under treatment) and arterial hypertension.

Contrast-enhanced cranial CT scan and angio-CT scan (Figures 1–3): giant, hyperdense, polylobed, right parietal, parasagittal and paraventricular, extra-

axial mass (60/57/62 mm) causing severe intraparenchymal compression (blue arrow). Perilesional edema (yellow arrow). Significant mass effect on the right lateral ventricle (purple arrow).



Figures 1–3. Preoperative contrast-enhanced cranial CT scan and angio-CT scan.



Figures 4 and 5. T1 contrast-enhanced cranial MRI: giant, hyperintense, heterogeneous, polylobed, right parietal, parasagittal giant tumor (blue arrows).

Preoperative embolization of the peritumoral feeding vessels was performed 24 hours before the surgical intervention. As a result, intraoperative haemorrhage was 300 ml instead of 1500–2,000 ml.

A neurosurgical procedure was performed (right parietal craniotomy, subtotal resection under magnification (Zeiss 3.5x loupes)), with a 2–3 mm residual fragment. The resection was subtotal due to a drop in blood pressure, which necessitated expediting the neurosurgical intervention. Duration of surgery: 4 hours and 30 minutes.

Corticoids (Dexamethasone) were administered a day before surgery to prepare the patient for surgery and 5 days post-operatively (to reduce and prevent cerebral edema), together with anticoagulant treatment and analgesics.

The patient received postoperative prophylactic anticonvulsant phenytoin (5 mg/kg/day, oral) for 1 week.

Histopathologic grading was classified according to WHO classification of meningioma grading³.

Postoperative cranial CT scan (Figures 6, 7, and 8) reveals subtotal tumor resection (residual tumor tissue 2–3 mm – red arrow).



Figures 6–8. Postoperative cranial CT scan: subtotal tumor resection (residual tumor tissue 2–3 mm, red arrow).

Intraoperative pathological examination: WHO Grade 1 meningioma.

Neurotropic treatment for neuroprotection (Cerebrolysin: two 10 mg IV ampoules/day; Cerebleu: one ampoule per day) for 30 days. Nursing care, chest percussion.

Daily mobilization: initially passive, then progressively active.

The postoperative course was favorable, with progressive improvement in the lower-limb motor deficit and level of consciousness. The severe left-sided hemiparesis improved as follows: brachial plegia (from ASIA 1 to ASIA 3) and lower-limb paresis (from ASIA 2 to ASIA 4). Postoperative follow-up: 110 days.

DISCUSSION

Given the increase in life expectancy and the widespread access and use of brain imaging, the incidence in the elderly population (≥ 65 years) is continuously increasing⁴.

Surgical management of symptomatic meningioma in the elderly is still a high-risk surgery due to the increased complication rate³.

In regard to the elderly patient, even more so, the therapeutic options become a matter of profound debate¹:

- the wait-and-see strategy;
- partial removal;
- total removal;
- radiosurgery.

In terms of the surgical time, the lower the duration of the surgical procedure, the better the outcome; Simpson Grades I and II were significantly correlated with good outcomes¹.

The length of hospitalization was significantly related to the outcome¹. There was a statistically significant correlation between the extent of tumor resection; Simpson Grades III and IV were associated with a poor post-operative KPS score (< 80)¹.

KPS > 70 is a favorable prognostic factor³. Elderly patients usually had a chronic illness: 71.4% had hypertension (HTN), 31% had diabetes mellitus (DM), and 14.3% of patients suffered from a respiratory disease as they were smokers^{1,3}.

Patients aged 70 years or more, Karnofsky score less than 70, duration of surgery more than 4 h, and extent of tumor resection are suggested as predictive factors for surgical outcome^{1,3}.

Asymptomatic meningiomas are usually followed up without surgery, especially in the elderly, where there is a higher incidence of both morbidity and mortality³.

Surgical resection of meningioma in the elderly is not a low-risk surgery. The literature reveals a wide range of mortality, extending from 1.2 up to 45% in some studies^{3,5}.

In elderly patients, comorbidities and the level of independence for daily activities have a major impact on the clinical and neurological outcomes, at both short- and long-term post-operative follow-up⁵.

In elderly patients, progressive cognitive decline could be appreciated in the form of cognitive impairment or even full-blown dementia⁵. Cognitive impairment hinders individuals' daily activities due to decline of memory, attention and cognitive function⁹.

The selection criteria for adjuvant radiosurgery were the partial removal of the tumor and a residue less than 3 cm in diameter that showed a volumetric increase at the first radiological follow-up. The adjuvant role of the Gamma Knife in reducing recurrence for residual meningiomas is well established^{10,11}.

Surgical removal of giant cerebral meningiomas (diameter ≥ 5 cm) entails a high complication rate¹².

Despite short-term excess mortality, very old patients operated for intracranial meningiomas seem to have similar long-term survival rates as compared to the matched general population. As most operated patients sustained or regained their capability to live at home, surgery of selected, symptomatic and very old IM patients may be justified.

CONCLUSIONS

- The pre-operative Karnofsky score is the main factor influencing clinical outcomes.
- The patient's age cannot be considered an absolute contraindication for the surgical procedure.
- Combined surgical and adjuvant radiosurgical treatments allow the reduction of intraoperative bleeding, surgical timing, post-operative complications and length of hospitalization.
- Resection of giant symptomatic intracranial meningioma in elderly patients is a mandatory method for improving life expectancy with a good quality of life, even if the procedure carries a life-threatening risk and a potentially high complication rate.

Authors' contributions

All authors contributed to the study conception. Material preparation, data collection and analysis were performed by BD and TL. TA embolized the tumor's arterial feeders. The first draft of the manuscript was written by BD and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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