

Falcine meningioma. A case report

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Case Report

Neurologic Surgery



Background: Falcine meningiomas are uncommon extra-axial tumors arising from the falx cerebri. Their close relationship with the superior sagittal sinus and anterior cerebral arteries makes surgical management particularly challenging, especially in elderly patients and in cases with bilateral extension.

Case Presentation: An elderly male in his ninth decade of life presented with sudden bilateral lower-extremity weakness followed by a ground-level fall. Cranial computed tomography and magnetic resonance imaging revealed a large solid-cystic extra-axial lesion arising from the falx cerebri, associated with extensive peritumoral edema. The patient underwent microsurgical resection through a right precoronal craniotomy using an interhemispheric approach. Intraoperatively, a firm bilateral falcine meningioma with dural attachment, left frontal encephalomalacia, and encasement of both anterior cerebral arteries was identified. Gross total resection was achieved while preserving the involved vascular structures.

Keywords: meningioma, falcine meningioma, craniotomy, extra-axial tumors.

Meningiomas are extra-axial tumors arising from arachnoid cap cells and represent the most common benign primary tumors of the central nervous system. They account for approximately 36.4% of all intracranial tumors.

Falx meningiomas are a distinct subtype of meningioma that originate from the cerebral falx and remain completely concealed by the overlying cerebral cortex. These tumors typically exhibit unilateral growth within one cerebral hemisphere; however, bilateral extension is frequently observed.

The incidence of meningiomas increases with age, with most cases being diagnosed in adults and a marked rise observed after 65 years of age. They occur more frequently in women than in men (female-to-male ratio >2:1 intracranially and 4:1 in the spine)¹ and are more prevalent among individuals of African descent. Approximately 80-82% of meningiomas are classified as grade I (benign), whereas the remaining cases correspond to atypical grade II meningiomas (17-18%), with malignant or anaplastic grade III tumors being considerably less common (1-3%)².

Case report

Case presentation: An elderly male in his ninth decade of life presented after a ground-level fall secondary to the sudden onset of bilateral lower-extremity weakness, resulting in direct impact to the right side of the face. There was no loss of consciousness or seizure activity. Computed tomography (CT) and magnetic resonance imaging (MRI) revealed a large solid-cystic extra-axial lesion associated with extensive peritumoral edema.

Medical history: The patient had no history of chronic degenerative diseases. He reported a previous cranial surgery, although the timing and indication were unknown. He denied any known drug allergies, previous blood transfusions, tobacco use, alcohol consumption, or illicit drug use.

The patient subsequently underwent surgical treatment consisting of a right precoronal craniotomy. After a C-shaped dural opening based on the superior sagittal sinus, an interhemispheric approach was performed. Initial devascularization of the tumor attachment was achieved, followed by central tumor debulking. The anterior, lateral, and ipsilateral posterior margins of the lesion were progressively dissected, allowing the removal of the tumor capsule. The middle third of the falx cerebri was then resected, followed by total resection of the contralateral tumor component while preserving both anterior cerebral arteries. The cystic component was opened into the lateral ventricle to facilitate decompression. A watertight dural closure was performed, the bone flap was replaced, and a subgaleal drain was left in place. **Intraoperative findings:** A firm frontal lesion with dural attachment to the falx cerebri and bilateral extension was identified. Left frontal encephalomalacia was noted, along with tumor encasement of both anterior cerebral arteries.

Postoperative course: During the first 24 hours after surgery, the patient remained stuporous but demonstrated progressive neurological improvement, ultimately becoming awake and responsive. A postoperative computed tomography (CT) scan demonstrated a small pneumocephalus measuring approximately 1 cm³. At the time of evaluation, the

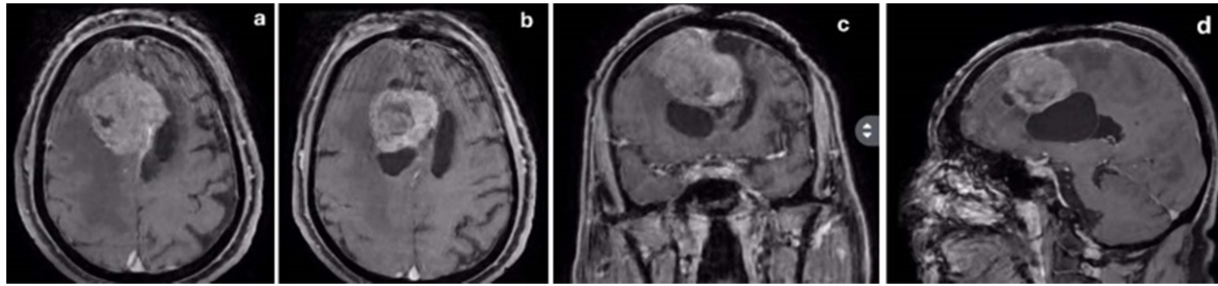


Figure 1. Pre-op MRI.

patient exhibited residual weakness of the extremities but was fully conscious, oriented to person, place, and time, and able to communicate coherently. He reported minimal pain at the surgical site and denied nausea, visual field deficits, or other neurological complaints. He remained afebrile, successfully resumed oral intake, and tolerated liquids without difficulty.

Following surgery, the patient developed transient postoperative stupor and disorientation, with a Glasgow Coma Scale (GCS) score of 13 (E4, V4, M5). Neurological examination revealed no evidence of pyramidal tract signs. Muscle strength was graded as 4/5 in all extremities according to the Medical Research Council (MRC) scale, Babinski sign with bilateral plantar flexor response. The patient's neurological status progressively improved during hospitalization, and he was discharged with a GCS score of 14, presenting only mild residual disorientation with respect to time.

Discussion

Falcine meningiomas are uncommon tumors arising from the falx cerebri and account for approximately 8–10% of all intracranial meningiomas. Their deep midline location and close relationship with the superior sagittal sinus, falx cerebri, and anterior cerebral arteries often make surgical management technically demanding. Although these tumors are generally slow-growing, they may remain clinically silent until they reach a considerable size and produce mass effect or neurological deficits.

The present case illustrates several features that increase surgical complexity. First, the lesion

demonstrated bilateral extension across the falx, requiring an extensive interhemispheric dissection to achieve complete tumor removal. In addition, preoperative neuroimaging revealed marked peritumoral edema, which has been associated with increased surgical morbidity, more difficult brain retraction, and a higher risk of postoperative neurological deterioration.

Gross total resection remains the primary therapeutic goal whenever it can be achieved without compromising neurological function. Numerous studies have demonstrated that the extent of resection is one of the strongest predictors of local tumor control and progression-free survival. However, in falcine meningiomas, the pursuit of radical resection must be balanced against the risk of vascular injury and neurological morbidity, particularly when the tumor is adherent to critical neurovascular structures.

This case highlights that complete microsurgical resection of a giant bilateral falcine meningioma involving both anterior cerebral arteries can be safely achieved through meticulous microsurgical technique, careful preservation of the surrounding neurovascular anatomy, and appropriate postoperative management. Favorable neurological recovery in this patient underscores the importance of individualized surgical planning, particularly in elderly patients with complex falcine meningiomas.

Conclusion

Meningiomas are the most common benign intracranial tumors of the central nervous system. The clinical presentation of meningiomas is largely

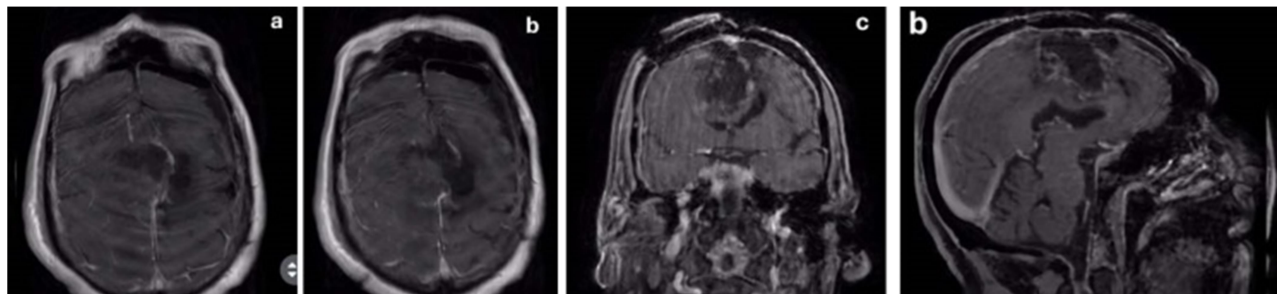


Figure 2. Post-op MRI.

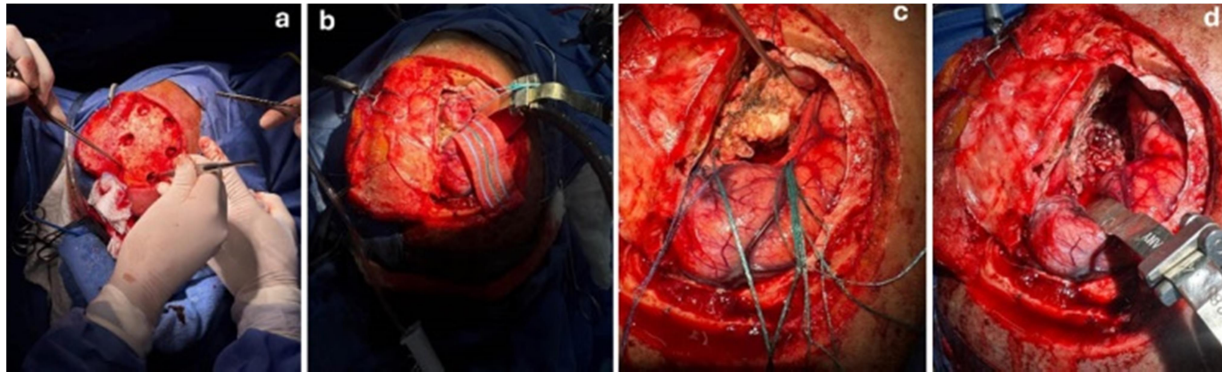


Figure 3. Intra-operative images showing meningioma location and its anatomical relationships.

determined by their anatomical location. Owing to their typically slow growth, symptoms often develop insidiously and may remain unnoticed until the lesion reaches a considerable size or exerts significant mass effect.

Microsurgical resection remains the cornerstone of treatment, and the extent of resection is the most important predictor of tumor recurrence and progression. Incomplete resection is associated with an increased risk of recurrence, which may occur within 5 to 10 years depending on the tumor's biological behavior and histopathological grade.

The reported incidence of postoperative neurological deficits ranges from 2% to 30%, primarily depending on tumor location and the extent of surgical resection.

Conflicts of interests

The authors declare no conflicts of interests.

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