

Falcotentorial meningioma treatment

Falcotentorial meningiomas represent a rare subgroup of complex meningiomas. Debate remains regarding the appropriate treatment strategy for and optimal surgical approach to these tumors.

Meningiomas originated at the falco-tentorial region: Analysis of topographical and diagnostic features guiding an optimal surgical planning ¹⁾.

The primary aim of surgical treatment for falcotentorial meningiomas is gross total excision. The vital surrounding brain structures make this a complex task.

Several surgical approaches have been described to treat falcotentorial meningiomas:

- 1.-Supracerebellar infratentorial approach
- 2.-Suboccipital approach
- 3.-Occipital transtentorial approach
- 4.- Combined supratentorial and infratentorial approaches ^{2) 3) 4)}.

A steep tentorial angle is an unfavorable preoperative radiographic factor for achieving maximal resection with the supracerebellar infratentorial approach. Collectively, a study of Zhao et al. showed that versatility is required to treat patients with falcotentorial meningiomas and that treatment goals and surgical approach must be individualized to obtain optimal surgical results ⁵⁾.

There are two main issues in treating falcotentorial meningiomas. One is selecting the surgical approach, which includes design of the bone flap. The other main issue is whether main venous structures will be sacrificed for a radical tumor resection.

In all of the cases, Hong et al. tried to make an adequately sized bone flap, even when the tumor was quite large. Some authors have insisted on performing wide craniotomies for large falcotentorial meningiomas ⁶⁾.

Quiñones-Hinojosa, et al. ⁷⁾ described a bilateral occipital transtentorial/transfalcine approach for large falcotentorial meningiomas. They ligated and cut the transverse sinus after checking the patency of the occluded sinus, and used permanent aneurysmal clips to ligate the vein of Galen when the straight sinus was occluded. The area above and below the tentorium can provide wide exposure and reduce occipital lobe retraction during prolonged operation times. Moreover, this approach may allow surgeons some form of intraoperative flexibility in terms of their surgical plan.

Hong et al. do not suggest routine application of wide craniotomies, such as the combined supratentorial and infratentorial approach. This is because wide craniotomies may increase the total amount of bleeding, prolong the operation time, and increase the risk of cerebral cortex injury. Moreover, it is possible to completely remove huge falcotentorial meningiomas without neurological deficit via relatively small craniotomies.

A catheter for CSF drainage was inserted into the ventricle or cisternal space through the safest area in each patient. They also designed small craniotomies through which the possible access area

covered the entire tumor territory. Thus, if a CSF drain is possible, then appropriately designed small craniotomies are sufficient to achieve complete tumor resection without cortex injury ⁸⁾.

There are some reports that have described usage of ligation and sectioning of the transverse sinus with or without reanastomosis ^{9) 10)}.

Although many authors have reported safe ligation of the transverse-sigmoid sinus, some complications have been described ^{11) 12)}.

Every venous structure should be preserved even if they seem to lack significant function. This will help prevent complications associated with delayed lobar parenchymal hemorrhage that can be attributed to [venous infarction](#).

In conclusion, surgical approaches should be tailored to each patient according to the origin and direction of tumor growth, feeding arteries, and the surrounding venous drainage system.

Hong et al. found that a relatively small craniotomy was sufficient to completely remove each tumor. Moreover, they found that the most important factors for avoiding surgical complications were to preserve vital deep neurovascular structures, as well as flow through the venous sinuses.

The results showed that falcotentorial meningiomas could be cured via single-stage operations without complications by applying careful perioperative planning and a delicate microsurgical technique ¹³⁾.

Videos

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In this operative video, the authors demonstrate an illustrative step-by-step technique for endoscopic-assisted microsurgical resection of a falcotentorial meningioma using the posterior interhemispheric retrocallosal transfalcine approach for a superiorly positioned falcotentorial meningioma. The surgical nuances are discussed, including the surgical anatomy, gravity-assisted interhemispheric approach in the lateral position, retrocallosal dissection, transfalcine exposure, tumor removal, and preservation of the vein of Galen complex. In summary, the posterior interhemispheric retrocallosal transfalcine approach is a useful surgical strategy for select superiorly positioned falcotentorial meningiomas.

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