

Pineal region meningioma

[Pineal region intracranial meningioma](#) are extremely rare

Classification

[Falcotentorial meningioma](#) and [velum interpositum meningiomas](#). It is very difficult to discriminate between these two lesions and description of the clinical presentation and the surgical technique in approaching these tumors is limited.

Treatment

see [Pineal Region Meningioma Surgery](#)

Case series

2017

In 27 consecutive patients who underwent tumor resection through the [Poppen approach](#) for [tentorial meningioma](#) or [pineal region meningiomas](#), the following morphologic parameters were assessed on a preoperative MRI: 1) tentorial angle; 2) tentorial length; 3) the shortest distance from the confluence of sinus to the tumor. All these parameters, together with tumor size, texture, and resection extent, were correlated with occipital lobe damage by using the ANOVA test, chi-square test, or Fisher's exact test.

The mean value was $55.3 \pm 5.6^\circ$ (range 45-66°) for the tentorial angle, which was significantly associated with the occipital lobe damage grades ($p=0.008$), but this was not the case for the tentorial length ($p=0.802$) and the shortest distance from the confluence of sinus to the tumor ($p=0.695$). Interestingly, age was also strongly associated with occipital lobe damage risk ($p=0.020$). The patients in the subgroup with no occipital damage (Grade 4) were the youngest (aged 47.3 years), compared with other grades, with age of 58.0 years for Grade 1, 54.3 years for Grade 2, and 58.6 years for Grade 3. These two parameters were also significant after multivariate analysis. No correlation was observed between either tumor nature or the extent of resection and damage grades.

The risk of occipital lobe damage increases in the presence of a steep tentorial angle during the Poppen approach for tentorial or pineal area tumors. Awareness of such anatomical features preoperatively is important for minimizing operative complications ¹⁾.

2014

[Clinical data](#) were obtained on 15 [meningiomas](#) of the [pineal region](#) from March 2009 to June 2012. These [patients](#) were hospitalized in the Department of Neurosurgery, the First Affiliated Hospital of

China Medical University , Shenyang, Liaoning , P.R. [China](#).; their [data](#) were collected and analyzed [retrospectively](#).

The tumors were removed via the right Poppen's approach in 12 cases and left Poppen's approach in 3 cases, and intraoperative [external ventricular drainage](#) was performed for [hydrocephalus](#) in 3 cases. As a result, [gross total resection](#) was achieved in 11 cases, [near total resection](#) in 3 cases and [subtotal resection](#) in 1 case. All resected tumors were pathologically confirmed.

The postoperative complications included two cases of [homonymous hemianopsia](#), and deteriorated [Parinaud syndrome](#) and [diplopia](#) in one case. Ten cases were followed up (range 1-4 years) and no [death](#) occurred. On the basis of the existing literature, the unilateral Poppen's approach is appropriate for most meningiomas of the pineal region that are small or intermediate in size. However, gross total resection might be difficult via the unilateral Poppen's approach for large-sized meningiomas with much contralateral infratentorial extension due to limited exposure. For these cases, combined supra-infratentorial or bilateral Poppen's approaches are recommended. Preoperative or intraoperative external ventricular drainage can increase tumor exposure and improve microsurgical effects ²⁾.

1996

Ten cases of meningioma of the pineal region were histologically verified at a single institution during an 8-year period. These represented 0.3% of 3061 intracranial meningiomas, as well as 6.2% of 164 pineal tumors. Patients were predominantly women. Symptoms and signs of increased intracranial pressure were most common, whereas Parinaud's syndrome was observed in only one case. Computerized tomography (CT) was the main diagnostic test used in the present series. It usually revealed a hyperdense mass with high-intensity contrast enhancement and a calcified mass eccentrically located at the periphery, which returned to its central location postsurgically and was likely to represent a calcified pineal gland. Magnetic resonance imaging was performed in the more recent cases and confirmed the suspicion raised by CT of a meningioma with a calcified mass at its periphery. Surgery was performed using an occipital transtentorial microsurgical approach with the patient placed in the semisitting position. Gross-total tumor removal was achieved in all cases, although this required sacrifice of the vein of Galen in six patients. Venous occlusion was performed only after adequate intraoperative verification of functional occlusion and blood flow diversion from the galenic system and had no consequences in any case but one. This latter patient had an infiltrative meningioma that was removed at the expense of intraoperative sacrifice of the two internal cerebral veins, as well as unavoidable trauma to the region of the quadrigeminal plate. All the remaining patients improved postsurgery, and only one had a permanent visual field deficit as a result of the surgical approach. Pineal meningiomas represent a rare subgroup of pineal tumors that can be treated surgically with reasonably good results. Sacrifice of major basal veins may be required to achieve radical tumor removal and can be tolerated by the patient provided that functional occlusion of the galenic system, as indicated by preoperative angiography, is verified during surgery ³⁾.

Case reports

2015

In Case 1, a 37-year-old woman presented with a progressing headache. Magnetic resonance imaging

(MRI) showed a large tumor in the pineal region, displacing the [vein of Galen](#) upward. Angiography disclosed occlusion of the vein of Galen, with deep venous flow draining through the veins on the right medial surface of the occipital lobe to the superior sagittal sinus.

In Case 2, a 67-year-old man presented with dizziness. MRI demonstrated a large mass in the pineal region, displacing the vein of Galen inferiorly. Angiography disclosed occlusion of the vein of Galen, with deep venous flow draining through the collateral venous channel into the transverse sinus. Both tumors were totally excised (Simpson Grade III for Case 1, Grade I for Case 2) via a left occipital transtentorial approach. No dural attachment was recognized in either case, but the tumor in Case 1 was firmly adherent to the inferior portion of the AMG, while that in Case 2 was attached to the superior portion of the AMG, but remained dissectible.

The reported two cases of pineal-region meningiomas originating from the arachnoid membrane over the vein of Galen, resulting in meningioma without dural attachment. These tumors can be totally resected by careful dissection of the tumor from the arachnoid membrane surrounding the vein of Galen ⁴⁾.

1)

Li D, Zhang H, Jia W, Zhang L, Zhang J, Liu W, Ni M, Jia G. Significance of the tentorial alignment in protecting the occipital lobe through the Poppen approach for tentorial or pineal area meningiomas. *World Neurosurg*. 2017 Aug 10. pii: S1878-8750(17)31310-4. doi: 10.1016/j.wneu.2017.08.013. [Epub ahead of print] PubMed PMID: 28804040.

2)

Qiu B, Wang Y, Ou S, Guo Z, Wang Y. The unilateral occipital transtentorial approach for pineal region meningiomas: a report of 15 cases. *Int J Neurosci*. 2014 Oct;124(10):741-7. doi: 10.3109/00207454.2013.878341. Epub 2014 Feb 7. PubMed PMID: 24397496.

3)

Konovalov AN, Spallone A, Pitzkhelauri DI. Meningioma of the pineal region: a surgical series of 10 cases. *J Neurosurg*. 1996 Oct;85(4):586-90. PubMed PMID: 8814160.

4)

Inoue A, Ohnishi T, Kohno S, Ohtsuka Y, Nakamura Y, Mizuno Y, Kitazawa R, Ohue S. Two cases of pineal-region meningiomas derived from arachnoid membrane over the vein of Galen without dural attachment. *World J Surg Oncol*. 2015 Jul 25;13:226. doi: 10.1186/s12957-015-0645-z. PubMed PMID: 26205525; PubMed Central PMCID: PMC4513678.

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