

Giant Olfactory Groove Meningioma

[Olfactory groove meningioma](#) (maximum diameter ≥ 6 cm)

The treatment poses special problems and represents a surgical challenge ¹⁾.

Extension into the ethmoid sinuses or extensively involves the bony floor of the anterior fossa. The traditional [bifrontal approach](#) provides only limited exposure in these situations, and a bilateral fronto-orbitonasal approach may be more effective ²⁾.

The [subfrontal approach](#) is a route preferred by most neurosurgeons for their excision. The [pterional-transsylvian](#) route represents an alternate exposure for microsurgery of frontobasal tumors. Although this approach has been already described for olfactory meningiomas, tumors of giant size were not specifically addressed in the literature ³⁾.

Case series

2011

Tomasello et al., discuss the long-term results in a series of 18 patients with giant OGMs and report the experience on a global strategy encompassing the [pterional approach](#) to manage the lesion and an extended [transbasal approach](#) to treat recurrences.

Between February 1991 and December 2007, 18 patients with giant OGMs were surgically managed via a [pterional craniotomy](#). Postoperative follow-up imaging was obtained at one, six, and 12 months and then yearly. In preoperative images, data from tumor volume were assessed. The volume of the residual right frontal porencephalic cave (ipsilateral to the operative side) was compared with the volume of the porencephalic cave measured in the left frontal lobe (internal control) in each case. Comparison between porencephalic cave and the original tumor volume for each side was also performed.

At the first operation in 17 of 18 patients (94.4%), the tumor resection was accomplished by a complete macroscopic lesion removal and coagulation of its dural attachment (Simpson grade II). In one patient, a Simpson grade V resection was obtained. The mean follow-up was 93.5 months, ranging from 12 to 214 months. Recurrences were observed in three patients (16.7%) at 103, 102, and 128 months, respectively, from the time of the first operation. These patients were operated on via an extended subfrontal transbasal approach accomplishing a complete (Simpson grade I) resection. No death occurred. The visual deficit improved in seven of 13 patients (53.8%), remained stable in five (38.5%), and worsened in one patient (7.7%). Overall, 17 of 18 patients (94.4%) had a good outcome and returned to their previous occupations. All the tumors presented with a symmetrical growth pattern. The mean meningioma volume was 23.51 ± 1.62 cm³ for the right portion of the tumor and 23.04 ± 1.35 cm³ for the left portion. The mean residual porencephalic volume was significantly smaller in the left frontal lobe (mean value 5.7 mL) than in the right frontal lobe (mean value 16.6 mL; $P < 0.05$). The mean residual porencephalic volume was significantly smaller than the tumor volume both in the left ($P < 0.01$) and in the right side ($P < 0.05$).

The pterional [transsylvian approach](#) provides two major advantages: first, it minimizes morbidity and

mortality through an early neurovascular control and by limiting parenchymal damage as demonstrated by a quantitative analysis; second it is associated with low recurrence rate at a long-term follow-up ⁴⁾.

1999

d'Avella et al., report the application of the pterional-transsylvian approach in six patients with giant olfactory meningiomas. This series is unique because it includes only patients with tumors exceeding 6 cm in diameter with bilateral symmetrical development. A radical removal was achieved in all patients and all of them made a full recovery. To investigate the relevance of the pterional-transsylvian approach for minimizing surgical morbidity, a magnetic resonance imaging protocol was designed to characterize even subtle postoperative frontal lobe structural changes. These changes, limited to the frontal lobe ipsilateral to exposure and localized in specific anatomical domains of the prefrontal area, included cystic degenerative alterations, parenchymal gliosis, and associated persistent white matter edema. Results from the present series strengthen the usefulness of the pterional-transsylvian approach as a safe surgical route for lesions affecting the anterior skull base, even with huge bilateral symmetrical expansion, such as giant olfactory meningiomas ⁵⁾.

Tamaki and Yin, reviewed the experience in five patients with resections of massive olfactory groove meningiomas to assess the advantages and risks of these two approaches. All patients were women (mean age, 45 years; range, 28-59) presenting with symptoms and signs related to increased intracranial pressure, cranial nerve impairment or brain compression. Computed tomography, magnetic resonance imaging and cerebral angiography were used for diagnosis and operative planning. The approach was bifrontal in two patients and bifronto-orbitonasal in three. Total surgical removal (Simpson grade I, three patients; Simpson grade II, one patient) was achieved in four patients (80%) and subtotal tumour removal (Simpson grade III) was performed in one (20%). One patient had two staged operations. No morbidity or mortality occurred in this series. No clinical or radiologic evidence of recurrence developed in the four patients whose tumour was resected totally. The bilateral fronto-orbitonasal approach resulted in safe and successful total removal of giant olfactory groove meningiomas, achieving long-term prevention of recurrence. They highly recommend this approach ⁶⁾.

¹⁾ ⁴⁾

Tomasello F, Angileri FF, Grasso G, Granata F, De Ponte FS, Alafaci C. Giant olfactory groove meningiomas: extent of frontal lobes damage and long-term outcome after the pterional approach. *World Neurosurg.* 2011 Sep-Oct;76(3-4):311-7; discussion 255-8. doi: 10.1016/j.wneu.2011.03.021. PubMed PMID: 21986430.

²⁾ ⁶⁾

Tamaki N, Yin D. Giant olfactory groove meningiomas: advantages of the bilateral fronto-orbitonasal approach. *J Clin Neurosci.* 1999 Jul;6(4):302-305. PubMed PMID: 10844751.

³⁾ ⁵⁾

d'Avella D, Salpietro FM, Alafaci C, Tomasello F. Giant olfactory meningiomas: the pterional approach and its relevance for minimizing surgical morbidity. *Skull Base Surg.* 1999;9(1):23-31. PubMed PMID: 17171078; PubMed Central PMCID: PMC1656717.

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