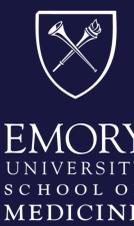




Petroclival versus Sphenoid Wing Meningiomas: An Analysis of Postoperative Complications



Karthik Papisetty, BA; Karen Salmeron-Moreno, MD, MSc; Travis Atchley, MD; Rommi Kashlan, BS; Hithardhi Duggireddy, MS; Josephine Buclez, MSc; Thomas McCaffery, BS; Chris D Kim; Karthik Valiveti; Uday Thakar; Derek Hu; Jennifer M Kim; Justin Maldonado, MD; Youssef Zohdy, MD; Gustavo Pradilla, MD; Tomas Garzon-Muvdi, MD, MSc

Department of Neurosurgery, Emory University

Introduction

Skull base meningiomas (SBM) often present with distinct anatomical challenges due to their proximity to essential structural pathways and neurovascular structures. With a wide variety of locations for SBMs, varying postoperative morbidity profiles can be expected.

Petroclival and sphenoid wing meningiomas are two common subtypes of SBMs and are intimately associated with the cranial nerves. However, there is a limited number of studies that directly compare the two pathologies concerning postoperative outcomes and morbidity.

Aims

To compare postoperative morbidity profiles between petroclival and sphenoid wing meningiomas by evaluating cranial nerve and visual outcomes, and to determine how tumor location influences the pattern of complications in order to guide surgical planning and patient counseling.

Methods

We retrospectively analyzed 110 patients (40 petroclival, 70 sphenoid wing) from our meningioma outcomes database who were treated between 2000 and 2022. Tumor location was determined from operative records and preoperative imaging studies, and postoperative complications were extracted from follow-up records. Outcomes included diplopia, tinnitus, sensory complaints, visual acuity, visual field defects, and facial pain. Group comparisons were performed with chi-square or Fisher's exact tests as appropriate.

Results

- Postoperative diplopia was more common in petroclival than sphenoid wing tumors (32.5% vs 14.3%, $p = 0.044$).
- Tinnitus occurred in 90% of petroclival patients compared with 1% of sphenoid wing patients ($p < 0.001$), and sensory complaints were similarly more frequent (87.5% vs 1%, $p < 0.001$).
- Visual acuity decline, however, was more frequent in sphenoid wing tumors (45.7% vs 15.0%, $p = 0.002$). Facial pain was also more common in petroclival tumors (30.0% vs 11.4%, $p = 0.030$).

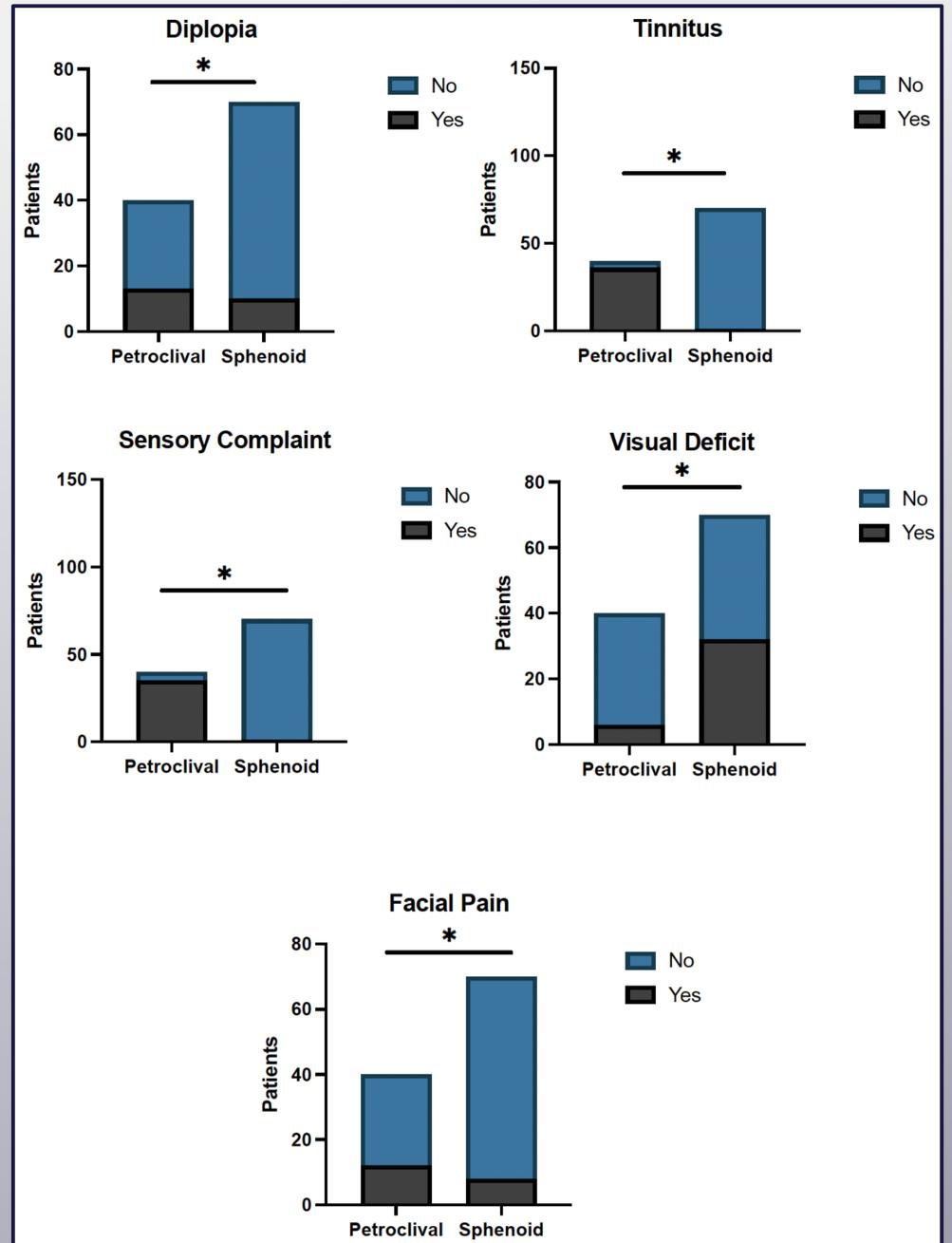


Figure 1: Differences in diplopia, tinnitus, sensory complaint, visual deficit, and facial pain between patients with petroclival or sphenoid wing meningiomas

Conclusion

Postoperative morbidity varies significantly depending on the location of meningiomas, particularly between petroclival and sphenoid wing tumors. Petroclival meningiomas, located near the brainstem and cranial nerves, are more likely to cause postoperative complications such as tinnitus, sensory deficits, and diplopia due to their proximity to critical neural structures.

In contrast, sphenoid wing meningiomas, situated closer to the optic nerve and orbit, are more commonly associated with postoperative visual deficits. The specific location of skull base meningiomas plays a crucial role in shaping the postoperative morbidity profile. Further comparative studies across meningiomas of different locations are needed to better inform patient education and set realistic postoperative expectations.

