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Middle Fossa Extension of Posterior Fossa Meningiomas is Associated with Poorer Clinical Outcomes

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Draft: 10/18/2019

Donald Y. Ye, MD; Michael P. Baldassari, BA; David Morgan, BS; Omaditya Khanna, MD; Aria Mahtabfar, MD; Tyler Henry, BA; Haley Wendt, BS; David W. Andrews, MD; Christopher J. Farrell, MD; James J. Evans, MD; Kevin D. Judy, MD

Introduction:

Progression of posterior fossa meningiomas (PFMs) can lead to extension into the middle cranial fossa. Pre-operative imaging allows for quantification of middle fossa extension (MFE). We aimed to determine the clinical impact of MFE on surgical and clinical outcomes during resection of PFMs.

Methods:

Craniotomies for meningiomas performed at a large single center academic institution from January 2012 to December 2018 were identified. Preoperative MRI and CT imaging was reviewed to determine the presence of MFE of posterior fossa meningiomas and correlated to post-operative outcomes.

Results:

65 PFMs were identified and mean follow-up was 28.8 ± 20.1 months. 13/65 PFMs showed MFE preoperatively. Average size of PFMs with MFE ($36.1 \text{ cm} \pm 12.1 \text{ cm}$) was similar to PFMs without MFE ($33.5 \text{ cm} \pm 9.2 \text{ cm}$, $p > 0.05$). 9/13 PFMs with MFE were petrous or petroclival, and 4/13 involved the cavernous sinus. Retrosigmoid craniotomy was the most utilized approach for both isolated PFMs (51.9%) and PFMs with MFE (76.9%). Anterior approaches were used in 2/13 PFMs with MFE. Presence of MFE was strongly associated with decreased rates of GTR (RR= 0.1; $p < 0.05$). MFE wasn't associated with longer LOS or rates of readmission within 30

Student Contributions:

1. Michael Baldassari – Abstract, Variable Design, Data Collection
2. David Morgan – Data Collection (Primary), Variable Design, Literature Review, Abstract
3. Haley Wendt – Data Collection
4. Tyler Henry – Analysis

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days of discharge, but was associated with a significantly higher rate of overall mortality at last follow-up (RR=5.3; 95%; $p < 0.05$).

Conclusion:

PFMs with MFE are easily identifiable and are associated with decreased rates of GTR and overall prognosis and may suggest the need for anterior or combined approaches.

Student Contributions:

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3. Haley Wendt – Data Collection
4. Tyler Henry – Analysis