

Preoperative and Histological Features Predict Recurrence and Survival in Atypical Meningioma after Primary Total Resection

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Introduction

Atypical (WHO grade II) meningiomas (AM) are associated with a substantial risk for recurrence even following a complete, gross total resection (GTR). In 2007 the WHO outlined key histopathological features to diagnose this heterogeneous type of tumor including high proliferative index and presence of brain invasion. The present study aimed to evaluate clinical and AM tumor characteristics that may predict risk of recurrence and survival within this patient population.

Methods

72 consecutive patients and corresponding tumor specimens who received a primary GTR for an AM from 2007-2016 at a single institution were reviewed. Preoperative patient and tumor characteristics and treatment parameters were correlated with post-resection outcomes including recurrence and 1-year survival. Cox regression models on recurrence-free survival (RFS) and Kaplan-Meier survival estimates were performed.

Results

Overall 1-, 3-, and 5-year RFS estimates for the AM cohort were 100.0, 82.4, and 78.1%, respectively, post-resection. High mitotic index was found to be an independent predictor of RFS on Cox regression analysis (HR = 1.26, $p = 0.008$), while tumor size trended towards a significant association (HR = 0.93, $p = 0.079$). Age and mitotic index were significantly associated with 1-year mortality (OR = 1.11 and 1.36, $p = 0.028$ and 0.045 , respectively).

Conclusions

AM tumors with a high proliferative index increased the likelihood of recurrence and short-term mortality even after complete resection. Tumor size may also contribute to recurrence risk within AM patients. While other histopathological features were not linked to recurrence or mortality within AM patients in the present cohort, biopsy examination can indicate key predictive information, and further molecular analysis may reveal additional prognostic markers.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Describe challenges that neurosurgeons encounter in the management of atypical meningiomas after gross total resection
- 2) Identify clinical and histopathological factors of atypical meningiomas that are suggestive of increased risk for tumor recurrence or survival

References

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