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The Relevance of Simpson Grade Resections in the Modern Neurosurgical Treatment of World Health Organization Grade 1, 2, and 3 Meningiomas

Jeff Ehresman BS; Kelly Gassie; Tomas Garzon-Muvdi MD MS; Davis Rogers BA; Michael Lim MD; Gary L. Gallia MD; Jon D. Weingart MD; Henry Brem MD; Chetan Bettegowda MD, PhD; Kaisorn L. Chaichana MD

Introduction

The Simpson grading system has played an important role in the surgical resections of meningiomas. This study set out to determine if this grading system predicts meningioma recurrence in a modern cohort of patients with tumors of all World Health Organization (WHO)

Methods

Adult patients who underwent primary, non-biopsy resection of a meningioma at a tertiary care institution between 2007 and 2015 were retrospectively reviewed. Stepwise multivariate proportional hazard analyses were used to identify associations with recurrence following resection. Log-rank analyses were used to compare Kaplan-Meier plots for time to recurrence between each Simpson grade.

Results

Of the 572 patients who met the inclusion criteria, 72 (12.6%) presented with recurrence. The factors associated with recurrence after gross-total resection (Simpson I-III) were non-WHO grade 1 (HR [95 % CI] 6.215 [2.864-12.419], $p < .0001$) and preoperative neurological deficits (HR [95 % CI] 2.862 [1.512-5.499], $p = 0.001$). Factors associated with recurrence after subtotal resections (Simpson IV) were African-American patients (HR [95 % CI] 2.776 [1.232-5.890], $p = 0.02$) and parafalcine location (HR [95 % CI] 3.956 [1.624-8.775], $p = 0.004$). Notably, the Simpson grading scale was not an independent risk factor for recurrence.

Conclusions

The identification and consideration of the factors associated with recurrence after gross-total or subtotal resections may help guide treatment strategies for patients with meningiomas.

Learning Objectives

By conclusion of this session, participants should be able to: 1) identify the role that Simpson grade can play in meningioma resections and 2) describe risk factors associated with greater risk of recurrence after meningioma resection