



Decompressive Hemicraniectomy: Predictors of Functional Outcome in Patients with Ischemic Stroke

Badih Daou MD; Anthony P Kent; Maria Montano; Nohra Chalouhi MD; Robert M. Starke MD MSc; Stavropoula I. Tjournakaris MD; Robert H. Rosenwasser MD, FACS, FAHA; Pascal Jabbour MD

Department of Neurosurgery, Thomas Jefferson University and Jefferson Hospital for Neuroscience, Philadelphia, Pennsylvania, USA

Introduction

Patients presenting with large-territory ischemic strokes may develop intractable cerebral edema that risks death unless intervention is performed. The purpose of this study is to identify predictors of outcome for decompressive hemicraniectomy (DH) in ischemic stroke.

Methods

Retrospective electronic medical record review of 1,624 subjects from 2006 to 2014 was conducted. Subjects were screened for DH secondary to ischemic stroke involving the middle cerebral artery, internal carotid artery or both. 95 subjects were identified. Univariate and multivariate analyses were performed for an array of clinical variables in relationship to functional outcome according to the modified Rankin Scale (mRS). Clinical outcome was assessed at 90 days and at the latest follow-up (mean 16.5 months).

Results

Mean mRS score at 90 days and at the latest follow-up post-DH was 4. Good functional outcome was observed in 40% of patients at 90 days and in 48% of patient at the latest follow-up. Mortality at 90 days was 18% and 20% at the last follow-up. Univariate analysis identified a greater likelihood of poor functional outcome (mRS 4-6) in patients with previous history of stroke (OR = 6.54; p = 0.017; [1.39-30.66]), peak midline shift (MLS) >10mm (OR = 3.35; p = 0.011; [1.33-8.47]), or history of myocardial infarction (OR = 8.95; p = 0.04; [1.10-72.76]). Multivariate analysis demonstrated elevated odds of poor functional outcome for previous history of stroke (OR = 9.14; p = 0.008; [1.78-47.05]), MLS >10mm (OR = 5.08; p = 0.002; [1.79-14.36]), history of diabetes (OR=3.07; [1.03-9.16]; P=0.045), delayed time from onset of stroke to DH (OR=1.32; [1.02-1.72]; P=0.037) and evidence of pupillary dilation prior to DH (OR= 4.19;[1.06 - 16.51]; P= 0.04). Patients with infarction involving the dominant hemisphere had higher odds of unfavorable functional outcome at 90 days (OR= 4.73; 95% CI: 1.36 - 16.44; p=0.014), however at the latest follow-up, cerebral dominance was not significantly related to outcome (OR= 1.63, 95% CI: 0.61 - 4.34, p=0.328).

Conclusion

History of stroke, diabetes, MI, peak MLS >10mm, increasing duration from onset of stroke to decompressive hemicraniectomy and presence of pupillary dilation prior to intervention are associated with a worse functional outcome.

Learning Objectives

To identify predictors of outcome for decompressive hemicraniectomy (DH) in the treatment of acute ischemic stroke.

References

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