

Effect of Annual Hospital Procedure Volume on Outcomes After Mechanical Thrombectomy in Acute Ischemic Stroke Patients: An Analysis of 13,502 Procedures

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Introduction

We aim to analyze impact of annual hospital volume on outcomes of endovascular mechanical thrombectomy (EMT) for Acute Ischemic Stroke (AIS). In the recent past increasing number of hospitals are acquiring capabilities for EMT procedure for the treatment of AIS, including some low volume centers. There is little data on outcomes comparing these hospitals with high volumes centers.

Methods

We queried NIS from 2008 to 2011 using ICD-9 CM diagnosis codes of 433-437.1 in any position for AIS. Adult patients with ICD-9 CM procedure code of 39.74 for mechanical thrombectomy were included in final cohort. Annual hospital procedure volume was computed using the unique hospital identification number (HOSPID) and was dichotomized corresponding to <10(low) and ≥ 10 (high) procedures per year. Co-morbid conditions were defined using the Deyo modification of Charlson's Co-morbidity Index (CCI). Primary outcomes were in-hospital mortality and any complications (combination of in-hospital mortality, ICH, vascular complications). We built hierarchical two level models adjusted for multiple confounding factors, with HOSPID incorporated as random effects in the model.

Results

A total of 13,502 procedures were available for analysis, out of which 3,352 (24.8%) were performed in low volume hospitals. Overall in-hospital mortality and any complications were higher in low volume hospital 25.6% vs. 21.1% ($p < 0.001$) and 34.2% vs. 30.2% ($p < 0.001$) respectively. However, in a multivariate hierarchical model, low volume hospitals was not associated with higher odds of in-hospital mortality and any complications [OR (Odd Ratio) 0.95; (95% confidence interval (95%CI) 0.74-1.23, $p = 0.684$)] and [OR 0.96; 95%CI 0.76-1.21, $p = 0.720$]. Similar results were observed even in sensitivity analysis.

Conclusions

Although proportion of in-hospital mortality was higher among patients undergoing EMT at low volume centers, risk adjusted odds of in-hospital mortality was similar to high volume EMT centers. Our findings raises important question on this phenomena for EMT procedure for AIS and warrant further studies.

Learning Objectives

Is standard of care treatment mechanical thrombectomy better performed at large volume center or can it be done safely and efficiently at low volume center as well?

References

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