Extubation Failure After Aneurysmal Subarachnoid Hemorrhage: A NSQIP Analysis



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Introduction

Extubation failure is common in patients with subarachnoid hemorrhage (SAH), but the potential for reintubation must be weighed against the morbidity of tracheostomy. The goal of this study was to 1) evaluate the predictors of reintubation and 2) assess its impact on mortality after open cerebral aneurysm repair.

Methods

- <u>Data Source</u>: National Surgical Quality Improvement Program (NSQIP, 2007-2013).
- <u>Inclusion Criteria</u>: Patients with SAH who underwent microsurgical clipping of an aneurysm.
- *Stratification*: By reintubation.
- <u>Predictor Variables</u>: Patient age; sex; comorbidities; premorbid functional status; American Society of Anesthesiology class; preoperative laboratory values; estimated Hunt -Hess grade; aneuerysm location; preoperative endotracheal intubation; and postoperative complications.
- <u>Statistical Analyses</u>: Multivariate logistic regression with forward prediction to evaluate predictors & hierarchical multivariate logistic to examine the impact of reintubation on other outcomes.





Results

- 373 patients were included, in whom extubation failure occurred in 11.0% (*n*=41).
- Reintubation occurred at a median 4 (interquartile range 1-7) days postprocedurally.
- In multivariate regression modeling, independent risk factors of extubation failure were diabetes (OR: 3.71, 95% confidence interval (CI): 1.41, 9.74, P=0.008), venous thromboembolic events (OR: 3.91, 95% CI: 1.18, 12.95, P=0.03), pneumonia (OR: 3.37, 95% CI: 1.38, 8.23, P=0.008), and sepsis (OR: 3.82, 95% CI: 1.54, 9.40, P=0.004).
- Dependent premorbid functional status (OR: 0.09, 95% CI: 0.02, 0.56, P=0.009) was protective against reintubation.
- Extubation failure was found to be associated with a significantly greater thirty-day mortality (19.5 versus 11.1%, OR: 9.66, 95% CI: 1.23, 75.74, P=0.03) and a higher odds of a length of stay of at least 24 days (OR: 4.33, 95% CI: 1.63, 11.46, P=0.003).
- However, extubation failure was not associated with differential odds of a non-routine hospital discharge (OR: 1.35, 95% CI: 0.24, 7.64, P=0.73).



Conclusions

- In this NSQIP analysis, extubation failure was common after aneurysm repair for SAH, and primarily associated with post-procedural complications rather than pre-morbid health status or comorbidities.
- Moreover, reintubation was significantly associated with inferior outcomes on some measures including thirty-day mortality and length of hospital stay.
- However, less that one-half of patients who required reintubation ultimately underwent tracheostomy placement.
- Future studies will be needed to compare patients undergoing a trial of extubation to early tracheostomy.

References

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