



Incidence and Predictors of CSF Leaks, Hearing Loss, and Facial Weakness Following Acoustic Neuroma Resection, a Multi-State Analysis with 1-Year Readmission Follow-Up

Bryan Iorgulescu; Theodore H. Schwartz MD FACS; Michael E. Ivan MD, MSc; Nelson Moussazadeh MD; Andrew T. Parsa MD PhD

Weill Cornell Medical College and Northwestern Feinberg School of Medicine Depts of Neurosurgery



Introduction

Iterative refinement of skull base approaches have dramatically improved outcomes in the recent decades. Of particular importance are reducing the rates of CSF leaks and damage to acoustic or facial nerves during acoustic neuroma resection, with the goal of improving the quality of life following surgery.

Methods

Statewide inpatient datasets comprising 100% of hospital discharges in the 3 most populous states (CA, FL, NY) with longitudinal identifiers, which track patients across multiple admissions, institutions, and years, were examined for 2006-2010. Algorithms, constructed from ICD-9 codes and validated by chart review, identified acoustic neuroma resection and prospectively-designated predictors and outcomes.

Initial resections in either 2006 or 2010 were excluded to ensure at least 1yr of follow-up.

Primary outcomes analyzed were readmissions for re-operation, CSF leak, hearing loss, or facial weakness. Secondary outcomes were readmissions with neurological events or infections, death during the operative admission, and costs. Predictors included presenting neurological sequelae and comorbidities, hospital volume, Charlson comorbidity index, and demographics.

Results

CA, FL, and NY together comprise 24% of the US population. After exclusion, there were a total of 1,957 patients who underwent acoustic neuroma resection.

4% of patients were readmitted for re-operation (median time to readmission: 207 days, IQR: 36-507) and 12% were readmitted with new-onset CSF leak (6%; median 15 days, IQR: 9-44), hearing loss (5%; median 55 days, IQR: 12-268), and facial weakness (0.4%; median 18 days, IQR: 5-148). Additionally, 0.3% of patients died during the initial operative admission (median 10 days after resection, IQR: 4-28).

Readmissions for new-onset hydrocephalus (2%; median 46 days, IQR: 20-297), convulsions (1%; median 46 days, IQR: 12-269), and hemorrhage (1%; median 30 days, IQR: 12-189) were associated with comorbidities at presentation, and readmissions for infection (7%; median 38 days, IQR: 14-190), were predominantly for meningitis (2%; median 18 days, IQR: 12-41), UTI (2%; median 37 days, IQR: 12-303), and wound dehiscence (1%; median 28 days, IQR: 15-119).

Conclusions

Readmission rates with CSF leaks, hearing loss, or facial weakness are persistently low following excision of acoustic neuromas, and are associated with comorbidities at presentation. Additionally, mortality rates in the perioperative period, while almost negligible, demonstrate room for continued prudence and improvement. These findings highlight the strides made in the neurosurgical paradigms for skull base approaches and resulting improvement in outcomes.

References

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