

Readmission, Reoperation, and Mortality Following Resection of Brain Metastases: A Nationwide Study

Saksham Gupta BA; Wenya Linda Bi MD, PhD; Alexandra M Giantini Larsen BS; Hassan Y Dawood BS; Luis Fandino BA;

Timothy R. Smith MD PhD MPH; Ayal A. Aizer MD, MHS; Ian F. Dunn
Department of Neurosurgery, Harvard Medical School, Boston, MA 02115

Introduction

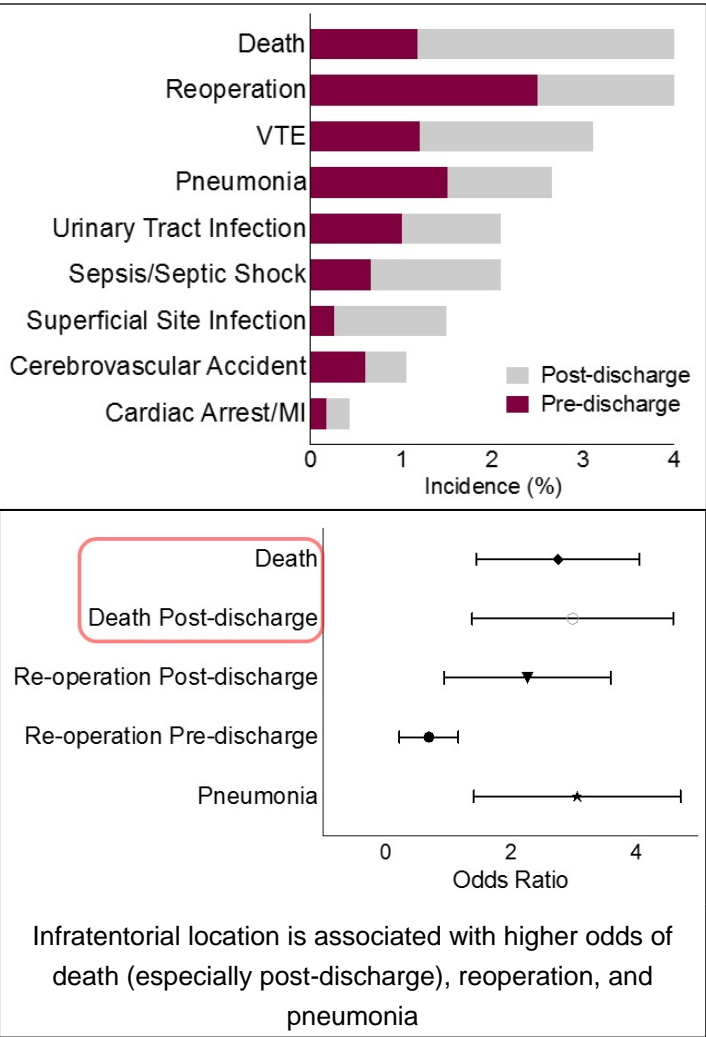
Introduction: Brain metastases are the most common type of brain tumor, though determining candidates for resection may be nuanced. Patients’ unfavorable prognoses make pre-operative risk stratification critical in the selection of patients that are likely to benefit from resection.

Methods

Methods: Multivariable logistic regression was applied to 3,649 cases in the American College of Surgeons National Surgical Quality Improvement Program database. The validated 5-criteria modified frailty index (mFI-5) score was utilized to quantify frailty, defined as mFI-5 of 2 or higher.

Results

Results: The majority of patients were female (55%) and the median age was 61 years old. Frailty was present in 17% of cases. Metastases were more commonly located supratentorially (76%). The most frequent post-operative medical complaints were venous thromboembolism (3.1%), pneumonia (2.7%), and urinary tract infections (2.1%). Unplanned readmissions occurred in 12% of patients and reoperations occurred in 5% of patients, most commonly for evacuation of hematoma and insertion of CSF shunts. The overall 30-day mortality rate was 4.2%, and the pre-discharge mortality rate was 1.2%. Infratentorial tumor location was associated with unplanned readmission (OR 1.5, p =0.001) -- in particular for hydrocephalus -- and reoperation (OR 1.7, p=0.003), especially for placement of CSF shunt and ventricular drain. In contrast, frailty was not associated with readmission or reoperation, but was associated with death overall (OR 2.8, p < 0.001) and specifically after



Conclusions

Discussion: Infratentorial tumor location is associated with post-operative complications related to poor respiration and hydrocephalus. Frailty was associated with death, in particular during the post-discharge phase. Both factors should be used in risk-stratifying patients, and frail patients may benefit from more frequent post-discharge follow-up.

Learning Objectives

By the end of this session, participants should be able to:

- 1) Describe how infratentorial brain metastasis location and patient frailty can be used as risk-stratification tools for specific post-operative complications
- 2) Apply our predictive model for post-operative death following resection of brain metastases to identify high-risk patients pre-operatively
- 3) Appreciate why frail patients may benefit from closer post-discharge follow-up