The Impact of Preoperative Endovascular Embolization on Immediate Meningioma Resection Outcomes

Poster ID: 42608

Michael G. Brandel, Robert C. Rennert, Jeffrey A. Steinberg, David R. Santiago-Dieppa, Christian Lopez, Peter Abraham, Arvin R. Wali, Kevin Porras, Yazeed Almosa, Brian R. Hirshman, J. Scott Pannell, Alexander A. Khalessi
Disclosures:

The project described was partially supported by the National Institutes of Health, Grant 1TL1TR001443. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.
Introduction

• Preoperative embolization of meningiomas facilitates surgical resection, but increases morbidity and mortality.
• The optimal use and timing of this procedure remains controversial.
• In this work, we study the impact of immediate preoperative embolization on immediate postoperative outcomes of meningioma resection using a large national database.
Methods

• **Patients:** Meningioma patients who underwent elective surgical resection.

• **Data Source:** National Inpatient Sample (NIS) 2002-2014.

• **Statistical Analysis:**
  - Patients who did or did not undergo preoperative embolization in the same admission prior to resection were matched 1:1 based on their Charlson Comorbidity Index (CCI).
  - This was intended to balance preoperative risk between patient groups.
  - Multivariate regression models with end points morbidity, mortality, and non-routine discharge disposition were used to test preoperative embolization, patient demographics, and hospital characteristics as predictors of adverse outcome.
Results

- 610 CCI-matched patients met inclusion criteria
  - 305 who underwent preoperative embolization and 305 who did not.
- Number of days between embolization and resection: 1.3 (range 0-17).
- **Adverse Outcomes** (Embolization versus non-embolization patients):
  - Stroke/infarction/hemorrhage (9.8% vs. 4.3%, p=0.007)
  - Cerebral edema (19.3% vs. 11.1%, p=0.005)
  - Non-routine discharge disposition (37.8% vs. 29.2%, p=0.024)
  - Cranial nerve deficits (3.3% vs. 3.6%, p=0.824)
  - Death (1.6 vs. 1.3%, p=0.733)
Results

• Multivariate regression:

  - Embolization (OR=1.58, p=0.021), stroke/infarction/hemorrhage (OR=6.56, p<0.001), and age (OR=1.06, p<0.001) were each independent risk factors for non-routine discharge.

  - Increased number of days between embolization and resection was also associated with non-routine discharge (OR=1.35, p=0.014) and major complications (OR=1.19, p=0.034), but not death.
Discussion

• Relative to meningioma patients who do not undergo preoperative embolization in the same admission, preoperative embolization patients may be more likely to experience complications and non-routine discharge, but not death. However, among embolization patients, early resection may be protective against some adverse outcomes, but timing does not impact mortality.
Summary Points

• A matched cohort of meningioma resection patients with or without preoperative embolization was identified.
• Patients undergoing preoperative embolization had increased adverse discharge, suggesting that they may be a high-risk group.
• The timing of resection following embolization did not impact mortality.