A Propensity Score-matched Comparison of Readmission Rates Associated with Microsurgical Clipping and Endovascular Treatment of Ruptured Intracranial Aneurysms

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Disclosure

• The authors have no relevant financial or personal interests to disclose
Introduction

- Surgical management of ruptured aneurysms includes clipping or endovascular therapy (EVT)
- Although these treatments have been rigorously compared, the readmission rates associated with each modality are not well-defined
  - Unplanned hospital readmissions may interfere with rehabilitation and limit functional recovery
  - Hospital readmissions are a major contributor to rising healthcare costs
Methods

• Adults admitted between 2010 and 2014 for aneurysmal subarachnoid hemorrhage (aSAH) in the Nationwide Readmissions Database (NRD) were included.
• Primary outcomes of interest were 30-day readmission (30dRA) and 90-day readmission (90dRA).
• Propensity scores were calculated to match patients who underwent clipping or EVT by five factors: age, comorbidity index, hospital volume, and NIS-SAH severity score.
Results

- 13,623 and 11,160 patients were eligible for 30dRA and 90dRA analyses, respectively.
- In the 30dRA cohort, 9,335 (68.5%) patients received EVT and 4,288 (31.5%) underwent microsurgical clipping. In the 90dRA cohort, 7,636 (68.4%) patients received EVT and 3,524 (31.6%) underwent clipping.
Results (cont.)

- After creating propensity score-matched pairs, 30dRA incidence was slightly higher in the clipping group (12.4%) compared to the EVT group (11.2%), but not statistically significant ($p = 0.094$)
  - Incidence of 90dRA was higher in the clipping group (22.5%) than the EVT group (19.7%, $p = 0.003$)

- Clipping was associated with poor functional outcome after 30dRA (OR = 1.51, 95% CI 1.21 – 1.88, $p <0.001$) and 90dRA (OR = 1.60, 95% CI 1.34 – 1.91, $p = 0.001$)
Results (cont.)

- Compared to 2010, the annual odds of 30dRA and 90dRA did not change between 2011 and 2014.
Results (cont.)

- No difference in mean (± SD) time to readmission for clipping (12.07 ± 9.01 days) compared to EVT (11.50 ± 8.95 days; p = 0.229)

- Among those readmitted within 30 days, mean cost of the readmission was $26,802 ± 36,192 for those who underwent clipping compared to $23,770 ± 29,731 for those who received EVT (p = 0.094)

- Patients who underwent clipping and were readmitted within 30 days experienced a mean LOS during readmission of 10.46 ± 13.84 days compared to 8.34 ± 13.13 days for those who received EVT (p = 0.009)
Discussion

• Poor functional outcome and 90dRA more common after clipping
  – This is in concordance with one year follow-up data from ISAT and BRAT

• Findings are in concordance with those of numerous other studies that demonstrate superior outcomes with coiling

• Limitations include retrospective nature and lack of granularity associated with NRD data
Summary points

• Clipping of ruptured aneurysms is associated with higher rates of 90dRA, but not 30dRA
• Poor functional outcome is more common when readmitted after clipping
• No difference in cost and duration to readmission
• Readmission LOS higher in patients who underwent clipping