TITLE: Preoperative Meningioma Embolization Is Safe but Costs More Than Non-Embolization Resections: A Multi-Center Retrospective Matched Case-Control Study

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ABSTRACT:

Introduction:
The literature has been mixed regarding the potential benefit of reduced blood loss with preoperative menigioma embolization (ME). However, a comparison of embolization-associated costs with non-embolization meningioma (NE) patients has not been completed.

Methods:
This is a retrospective case control study matched for tumor location, size, and radiographic appearance between two centers. We reviewed demographic and clinical data for 29 matched meningioma patients from each center. Studied variables included: EBL, Pre/Post operative Hg/HCT, and perioperative complications. Meningiomas were analyzed as a group and subdivided into whether from a skull base location or not. The additional ME cost was calculated.

Results:
Both groups had similar baseline characteristics. There was no significantly decreased blood loss based on EBL or Pre/Post operative Hg/HCT comparisons, although there was a trend towards decreased blood loss in the ME cohort. This was true for all meningiomas and when subdivided by skull base location. Successful embolization of a feeding vessel occurred in 76% of the ME patients (22/29 pts) while the other patients had angiograms due to unfavorable feeding vessel anatomy. Importantly, there were no complications associated with angiogram/embolization in the ME group. The mean additional charge per patient, which included procedural charges, embolic agent costs, as well as 1 night in the intensive care unit, was $88,767.

Conclusion:
The ME group had a trend towards reduced blood loss but required more transfusions but there was no blood-loss related morbidity in either group. Angiogram/Embolization was safe with no complications. However, in comparison to the NE control group, this did not reduce the rate of blood transfusion nor postoperative morbidity. Embolization accrued nearly an additional $90,000 in hospital charges. These findings were unchanged when meningiomas were further subdivided into skull base location or non-skull base location.