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Analysis of Wide Neck Aneurysms in the Barrow Ruptured Aneurysm Trial

Justin Robert Mascitelli MD; Michael T. Lawton MD; Peter Nakaji MD; Joseph M. Zabramski MD, FAANS, FACS; Robert F. Spetzler MD
The Barrow Neurological Institute

BARROW Neurological Institute

Introduction

Ruptured wide-neck aneurysms (WNAs) are difficult to treat and few publications have compared clipping to coiling in this specific cohort. The Barrow Ruptured Aneurysm Trial (BRAT) was a prospective, randomized trial comparing clipping and coiling for ruptured aneurysms. Using BRAT data, we aimed to determine (1) How many aneurysms had a wide neck? (2) Did wide-neck status influence treatment? (3) How did clipping outcomes compare to coiling outcomes for WNAs?

Methods

A post hoc analysis was conducted of saccular WNAs in the BRAT. Exclusion criteria from the original data set (n=471) included non-saccular aneurysm morphology (n=52), non-aneurysmal SAH (n=57), death before treatment (n=6), and insufficient angiographic data (n=29). A WNA was defined as maximum neck width =4 mm or maximum aneurysm dome-diameter–to–neck-width ratio <2. Both intent-to-treat and as-treated analyses were performed.

Results

Of the 327 patients analyzed, 177 (54.1%) had a WNA. WNAs were more likely to occur in older patients (p=0.03) with worse presenting clinical grade (p=0.02); they were more likely to arise from the MCA, basilar tip, or ICA other than the junction with the posterior communicating artery (p=0.001) and they were associated with worse clinical outcomes at all time points (p=0.01). WNAs were equally distributed in the assigned treatment groups (clip, 90/159 [56.6%] vs coil, 87/168 [51.8%]; p=0.38), but were overrepresented in the actual clipping group (clip, 136/218 [62.4%] vs coil, 41/109 [37.6%], p<0.001). Most patients (46/60, 76.7%) in the coil-to-clip crossover group had a WNA. There was no difference in clinical outcomes at any time point in either the intent-to-treat analysis or the as-treated analysis (p=0.33). The aneurysm obliteration rate was lower (p<0.001) and the retreatment rate higher (p<0.001) in the group of aneurysms actually coiled versus clipped.

Conclusions

This study is the first to compare clipping and coiling of WNAs on a large scale. Wide-neck status appeared to significantly impact treatment strategy in the BRAT, favoring clipping. Clipping and coiling of ruptured WNAs resulted in statistically similar long-term clinical outcomes. These results should be viewed in light of improved endovascular technology that has occurred over the last decade.

Learning Objectives

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

1) Understand the frequency of ruptured WNAs

2) Understand how WNAs compare to narrow neck aneurysms

3) Understand how wide neck status impacted treatment in BRAT

4) Understand how clipping compared to coiling for WNAs within BRAT