Use of Stent-assisted and Balloon-assisted Coiling in Aneurysmal Subarachnoid Hemorrhage: Analysis of 76 Patients

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Introduction

Aneurysmal subarachnoid hemorrhage can have neurologically devastating outcomes and potential aneurysms may provide technical morphological challenges in coil embolization. Two techniques, stent-assisted and balloon assisted coiling have been utilized to ensure aneurysm occlusion without parent vessel coil prolapse.

Methods

We studied a total of 491 patients, from 2007 to 2011 at a single neurovascular center with the diagnosis of SAH and an aneurysmal source identified on diagnostic cerebral angiography. Patients' aneurysms were treated with endovascular occlusion or craniotomy for clip ligation at the discretion of the treating physician. All charts were reviewed for clinical presentation, past medical history, laboratory values, surgical procedures, radiographic obliteration, and clinical outcome at discharge. Univariate analysis was used to test covariates collected at the time of aneurysm treatment that were predictive of angiographic obliteration, GCS at discharge, and the development of infarction on follow radiographic imaging between 6 months and 5 year follow up.

Results

There were 378 aneurysms (77%) treated by coil embolization and 113 aneurysms treated by clip ligation. 76 patients (15%) were treated with balloon (51 aneurysms or 65% of this subset) or stent assisted (25 aneurysms or 32% of this subset) coiling as adjunctive measures. 425 aneurysms (86%) were located in the anterior circulation while 66 were located in the posterior circulation. Significantly, the use of balloon or stent-assistance did not have any statistically significant difference in obliteration rates compared to the general un-assisted coiling population (p=0.178). Patients treated with balloon or stent assisted techniques also did not have any significant difference in rates of infarcts on post-operative imaging evaluating for delayed ischemic neurologic deficits.

Learning Objectives

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

Describe the predictors of angiographic obliteration and clinical outcomes for a SAH treated with coil assist techniques.

Conclusions

We report that the use of balloon and stent assisted coiling embolization does not appear to significantly diminish follow-up angiographic obliteration rate or increase the likelihood of infarcts on post-operative imaging.