

## Failure of Previously Coiled Anterior Communicating Artery Aneurysms: Incidence and Predictors of Subsequent Clipping

Elias Atallah MD; Sage Rahm; Carrie Andrews; Nohra Chalouhi MD; Stavropoula I. Tjoumakaris MD; Nabeel Herial MD; M. Reid Gooch MD; Robert H. Rosenwasser MD, FACS, FAHA; Hekmat Zarzour; Pascal Jabbour MD

### Introduction

Anterior communicating artery aneurysms (ACoMAs) represent the most common site of cerebral aneurysm formation and rupture. Ruptured ACoMAs often produce disabling cognitive deficits that may result in patient's incapacitation. Significant rates of aneurysm recurrence have been reported with coiled ACoMAs. We aimed to quantify the rates and the predictors of recurring coiled ACoMAs, and the subsequent need for irrevocable surgical treatment.

### Methods

We performed a retrospective cohort study of 521 consecutive patients treated in our center for their ACoMAs. Patients' electronic medical charts were reviewed between 2004 and 2016. Patients were cared for by dually trained neurovascular surgeons. Data on aneurysm characteristics, occlusion rates, recurrence rates, aneurysm re-rupture, and clipping with subsequent frontal and striatal infarct, was collected.

### Results

Of 521 patients who were coiled for their ACoMAs, 57 patients (11%; mean-age 49yo [SD=11]; females 56%) had failed treatment with depicted aneurysm persistent filling (n=2, 3.5%) or recurrence (n=55, 96.5%) on follow-up angiography. 30/57 (52.6%) patients continued to smoke. Aneurysm projection in a sagittal plane was as follows: 14 anteriorly, 10 posteriorly, 20 superiorly, 13 inferiorly. Average aneurysm size was 5.8mm (SD=2.4). 89.5% (51/57) presented initially with a ruptured ACoMA. Average aneurysm occlusion after primary coil deployment was 96% (SD=8). Occlusion rates according to Raymond Roy Scale were as follows: (77%) 44/57 Class 1, (21%) 12/57 Class 2, (1.7%) 1/57 Class 3. Average mRS at discharge was 1.8 (SD=1.2). Patients were followed on average for 27.6 months (SD=29). The average aneurysm occlusion on latest follow-up angiogram was 69%. Occlusions on follow-up were: (26.3%) 15/57 Class 2 and (73.7%) 42/57 Class 3. 2 (3.5%) patients re-ruptured their aneurysm. 6 (10.5%) patients required re-coiling. All the patients were microsurgically clipped. 6 (10.5%) patients had a subsequent frontal infarct. No other complications were clinically sighted (average mRS=1.4 [SD=0.8]).

### Conclusions

The recurrence rate of coiled ACoMAs is not negligible (11%), it should not be perceived as insignificant. It holds an imminent risk of aneurysm re-rupture, threatening with major disability and fatality.

### Learning Objectives

We recommend the selection of certain ACoMAs for a primary clipping rather than coiling as a permanent and conclusive modality of treatment.