

Anatomical Considerations for Treatment of Anterior Communicating Artery Aneurysms with Flow Diversión

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Introduction

Anterior communicating artery (ACoA) aneurysms remain challenging aneurysms to treat. There are scattered reports of use of flow diversion for treatment of ACoA aneurysms. We aim to specifically identify favorable anatomy and different considerations for successful treatment of ACoA aneurysms with flow diversion.

Methods

We performed a retrospective review of a prospectively collected database on treatment of aneurysms with flow diversion. Clinical and radiological data were collected for analysis including clinical presentation and demographics, anatomy of ACoA complex, complications, follow-up and outcome data.

Results

Our review yielded 11 patients with ACoA aneurysms treated with a Pipeline embolization device (PED). Nine of the patients were unruptured and 2 patients were treated in a delayed fashion after a hemorrhage. Four out of 11 failed previous treatment (n=2 coils, n=2 surgical clipping). In 5 cases, one of the A1 vessels was dominant and in 6 cases the A1 vessels were co-dominant. In the single dominant A1 configuration, the PED was used from A1 to ipsilateral A2 and in 60% of the cases adjunctive coiling was used. In the co-dominant configurations, 1 case utilized bilateral A1-A2 pipeline construct without coils; three cases utilized unilateral PED without coils; two cases utilized a unilateral PED with coils. When the contralateral A1 provided access to the aneurysm, coiling was often done utilizing the A1 vessel contralateral to the A1-A2 PED. In 10 cases, the aneurysm neck included the ACoA artery and the A1 or A2 Vessel. In 1 case the aneurysm neck was isolated to the ACoA artery and a bilateral PED complex in the A1-2 segments were used. In no cases did a PED cross the anterior communicator into the contralateral A2. Obliteration was noted in 100% of the cases with adequate follow-up (n=5). No complications such as hemorrhage or infarcts were seen.

Conclusions

The unique anatomy and configuration of different ACoA aneurysms allow for a variety of treatment options. For those patients undergoing consideration for flow diversion, careful consideration of the bilateral A1/A2 and ACoA anatomy and location of the vessels giving rise to the aneurysm neck, can lead to successful and safe treatment with flow diversion.

Learning Objectives

Flow diversion is a possible treatment for Anterior communicating artery aneurysms.