

Introduction

Flow diversion of ICA termination (ICAT) aneurysms is an option when surgical or other endovascular techniques are inadequate. Jailing the ACA with a flow diverter is effective when the Acom is patent. Jailing the MCA, a truly terminal circulation, is sometimes necessary and has not been reported.

Methods

A prospective, IRB-approved database was analyzed for patients with PED placement from the ACA to the ICA during cerebral aneurysm treatment.

Results

Nine cases were identified, including 5 proximal A1, 3 Pcom, and 1 ICAT aneurysm locations. Average aneurysm size was 8.3mm (range 3-17), with 67% saccular and 78% right-sided. Primary indication for treatment was significant dome irregularity (44%), recurrence or enlargement (33%), underlying collagen vascular disorder (11%), and traumatic pseudoaneurysm (11%). Preservation of the ipsilateral ACA (with PED placed in A1) was performed when the Acom (67%) or contralateral A1 (33%) were absent on angiography. Adjunctive coiling was done in 4 cases (44%). One major stroke occurred. This patient had an irregular 8mm proximal left A1 aneurysm treated with PED and coiling. Post-treatment angiography showed slight left MCA delay, however, hypotension during

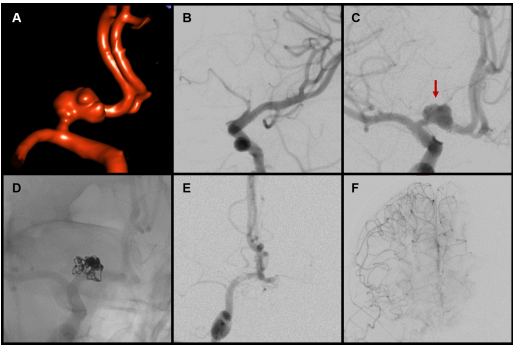
Results cont.

management of a retroperitoneal hematoma requiring surgical repair led to left MCA stroke ultimately resulting in death. Follow-up DSA in all other patients (average interval 15mos) showed complete aneurysm obliteration (100%). The jailed MCA showed minimal or mild delay (primarily antegrade flow) in 75% of cases and significant delay (reliance primarily on ACA and ECA collaterals) in 25%. One patient experienced mild weakness from MCA watershed territory ischemia during vasovagal hypotension after treatment and is currently mRS=2 at 18 months follow-up.

Conclusions

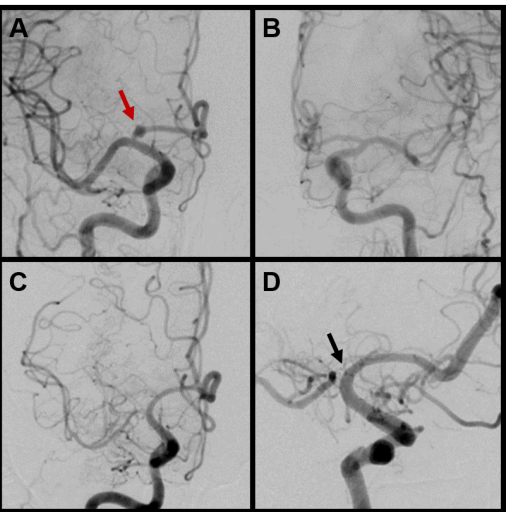
Rare circumstances necessitate jailing the MCA with a flow diverting stent. With strict attention to perfusion pressures during a period of collateral recruitment, excellent occlusion outcomes can be achieved while minimizing ischemic risks.

Figure 1. PED treatment of a dissecting 10 mm proximal right A1 segment aneurysm of the anterior cerebral artery (ACA), with a jailed right middle cerebral artery (MCA) and occlusion at 6 months and collateralization at 12 months.



(A) Pre-embolization 3D-rotational reconstructed image demonstrating the right A1 aneurysm, (B) digital subtraction angiogram (DSA; anterior-posterior view) of left internal carotid artery (ICA) demonstrating absence of a left A1 and (C) DSA (AP view) of right ICA illustrating bilateral filling of ACA territories via right A1 with aneurysm (arrow). (D) Coils were inserted and a PED was placed across the length of the aneurysm, jailing the vessel orifice of the right MCA. At 6 months (E), follow-up DSA of right ICA confirms complete occlusion of the aneurysm with 12-month follow-up (F) demonstrating ACA and external carotid artery collaterals supplying the right MCA territory.

Figure 2. PED treatment of a proximal right A1 segment aneurysm of the anterior cerebral artery (ACA) in the absence of an anterior communicating artery (ACoA), with a PED-jailed right middle cerebral artery (MCA) and occlusion at 12-month follow-up.



(A) Pre-embolization digital subtraction angiogram (DSA; anterior-posterior view, AP) of right internal carotid artery (ICA) demonstrating the right A1 aneurysm (red arrow), (B) DSA (AP view) of left common carotid artery (CCA) demonstrating absence of an ACoA. A PED was placed across the length of the aneurysm, effectively jailing the right MCA orifice. Follow-up DSA of (C) right CCA demonstrated shadowing across MCA with delayed flow and pial collateral development from ACA, while (D) the right ICA injection confirmed both antegrade grade flow through the MCA and aneurysm obliteration (black arrow).