

Introduction

The Pipeline Embolization Device (PED) has demonstrated safety and efficacy in a variety of off-label applications, with limited reports of its use for aneurysms along the middle cerebral artery.

Methods

Patients with middle cerebral artery (MCA) aneurysms treated with flow diversion were identified. Follow-up angiography was performed at 6 and 12 months. Occlusion was graded as complete, trace filling, entry remnant, or aneurysm filling. Clopidogrel was discontinued at 6 months; aspirin was reduced to 81 mg from 325 mg daily at 12 months.

Results

There were 40 cases of flow diversion for 41 MCA aneurysms, with 93% (38/40) successful rate. Twenty-nine patients (76%) were female. Average age was 53 ± 15 years, average size 5.4 ± 4.7 mm, neck size 2.7 ± 1.1 mm. Ten aneurysms arose from M1 (26%), 22 from MCA bifurcation (58%), 5 from M2 (13%) and 1 from distal MCA (3%). Average size of MCA bifurcation aneurysms was 5.2 mm (range 1.8 - 15mm), neck size 3 mm (range 1.5 - 5.5mm). Thirteen cases (34%) had previous treatment, and 14 (37%) had a history of subarachnoid hemorrhage. Morphology was 89% saccular, 8% fusiform and 1% dissecting. Balloon remodeling was performed in 2 cases (5%), adjunctive coiling in 4 cases (11%).

Results Continued

There were 2 in-situ thromboses (5%). One occurrence resolved following abciximab administration with no clinical significance. The other, an irregular right MCA bifurcation aneurysm treated with PED and coiling, was complicated by intra-procedural in-stent platelet accumulation and resolved with abciximab administration, however, the patient suffered left lower extremity paresis with mRS 4 at last follow-up. This was the only major complication (1/38; 2.6%), and no mortalities. Minor complications (3/38; 8%) included one minor stroke, one asymptomatic ICA dissection, and one post-operative cranial nerve III palsy without evidence for carotid cavernous fistula.

Follow-up angiography was available for 34/38 (89%) cases at average 12.4 months. Complete occlusion was achieved in 66% (n = 25), and 74% (n=28), at 6-, and 12-months, respectively. Of 14/19 MCA bifurcation aneurysms with available follow-up, 74% were completely occluded at average 11 months.

Conclusions

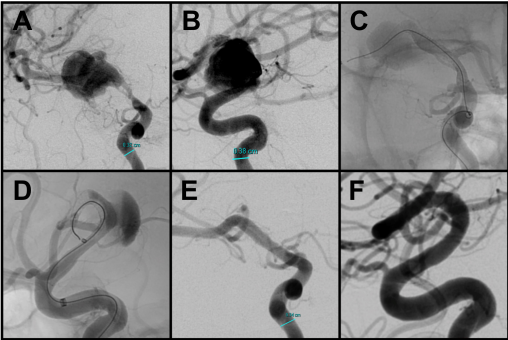
Treatment of MCA aneurysms with PED offers a favorable occlusion rate (74%) with acceptable major complication rate (2.6%).

Learning Objectives

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

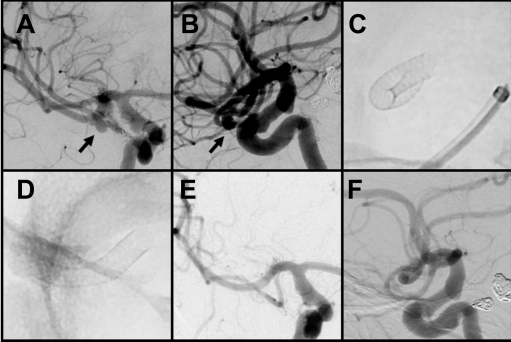
- 1) Describe the safety and efficacy of flow diversion embolization in treating MCA aneurysms.

Figure 1



42 year old male with a history of giant right M1(25 mm) aneurysm (A, B) treated with PED (C, D). (E, F) Complete aneurysm occlusion at 6-month follow-up DSA.

Figure 2



51 year old female with a history of small MCA bifurcation aneurysm (A, B) treated with PED (C, D). (E, F) Complete aneurysm occlusion at 6-month follow-up DSA. No anterograde filling of the covered superior division. The dependent MCA territory is supplied by pial collaterals arising from the inferior division of the MCA and the ACA and is without apparent filling defect.