Resolution of Cranial Neuropathies Following Treatment of Intracranial Aneurysms with the Pipeline Embolization Device

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Introduction

Intracranial aneurysms, especially those of the cavernous segment of the internal carotid artery (ICA), can present with cranial nerve palsies. Few studies exist reporting the outcomes of cranial neuropathies following treatment with the Pipeline Embolization Device (PED).

Methods

A prospectively maintained endovascular database was reviewed for all patients treated with the PED after presenting with one or more cranial nerve palsies secondary to a cerebral aneurysm since May 2011. Patient charts were reviewed to report clinical and angiographic outcomes. Only patients with clinical follow-up were included in the analysis.

Results

Since FDA approval, 127 patients were treated with the PED at our institution. Twenty-two patients presented with cranial neuropathies for initial inclusion in this study. Of these, 20 patients had sufficient follow-up for analysis. Cranial neuropathies included those of CN II, III, V, and VI, with presenting symptoms of diplopia, decreased visual acuity, and facial numbness/pain. Thirteen lesions were cavernous segment ICA aneurysms, whereas the remainder included supraclinoid and petrous segment ICA, posterior communicating artery and basilar trunk aneurysms. At a mean follow-up of 9.55 months, 15 patients (75%) had resolution or significant improvement of their cranial neuropathies and 5 had stable symptoms. Twelve (66.7%) of 18 patients with angiographic follow-up demonstrated complete obliteration or small neck residual, whereas 6 (30.0%) had residual lesion. Patients with complete/near-complete obliteration were significantly more likely to demonstrate symptomatic improvement at follow-up (p=.009). Two patients with persistent symptoms were eventually treated with microsurgical bypass. Complications in this series included six (30.0%) transient extracranial hemorrhagic complications related to antiplatelet therapy, and one delayed asymptomatic ICA occlusion following retreatment.

Conclusions

Treatment of intracranial aneurysms presenting with one or more cranial nerve palsies results in a high rate of clinical improvement after treatment with the PED. Clinical outcomes must be weighed against the risks and challenges faced with flow diverters.

Learning Objectives

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

1) Describe the incidence and treatment options for cranial neuropathies secondary to intracranial aneurysms.

2) Describe rates of clinical improvement following treatment with the PED.

3) Discuss theories for mechanism of clinical improvement following treatment with the PED.

4) Discuss the complication profile associated with use of the PED.

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