Continued Concern of Parent Vessel Steno-Occlusive Progression with Onyx HD-500 and the Utility of Quantitative MRI in Serial Assessment

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Learning Objectives

1- Understand that Onyx embolization of aneurysms is associated with a risk of delayed parent vessel occlusion

2- Describe the potential role of Quantitative MRI in serial assessment of these patients

Introduction

Onyx HD-500 is an alternative endovascular treatment in selected cerebral aneurysms. Widespread use is limited by technical demands and by competing advances in flow diversion technologies. Parent vessel steno-occlusive progression is reported, however the etiology and management is controversial.

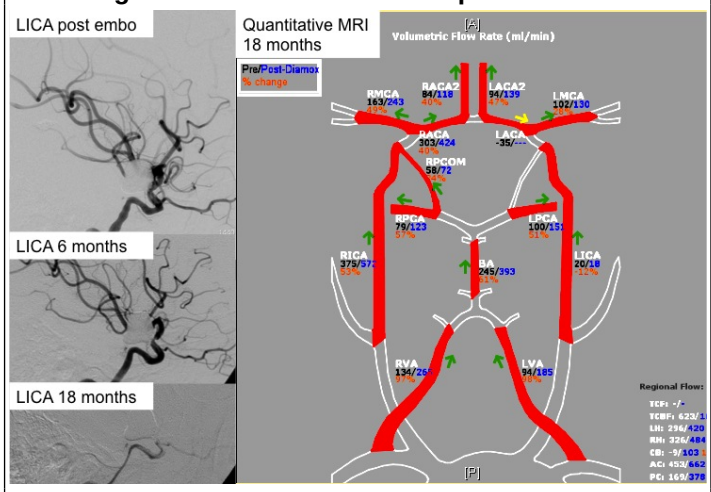
Methods

Medical records of patients treated with Onyx HD-500 were retrospectively reviewed under IRB approval at the University of Illinois at Chicago for 2008-2011. Clinical and radiographic evaluations were assessed.

Results

17 patients underwent treatment of unruptured ICA aneurysms with Onyx HD-500. Three patients (17.6%) developed visual symptoms post procedure: 2 permanent, and one temporary. Four patients (23.5%) developed delayed ICA stenosis at 6-8 month follow-up angiography despite a standard regimen of antiplatelet medication. Quantitative MRI (Q-MRI) was obtained on all of these patients. One slowly progressed to complete but asymptomatic ICA occlusion with stable MCA flow. The second developed asymptomatic 40% stenosis with normal flow values. The third patient had transient delayed worsening to 70% stenosis, proximal to the aneurysm neck with normal flow which returned to near baseline by 27-month follow -up. The fourth patient developed critical stenosis 5mm distal to the aneurysm neck and possible TIA. Q-MRI showed decreased MCA flow and angioplasty was performed with improvement in vessel caliber and increased flow. Repeat Q-MRI 11 months later demonstrated progressive reduction in MCA flow and angioplasty with stenting was performed. Prolonged dual antiplatelets were continued in 2/4 patients, one with progression of stenosis and one with improvement of stenosis.

Progression to occlusion with preserved flow



The ICA distal to the ophthalmic aneurysm gradually occluded. The MCA flow on Q-MRI showed stable, symmetric flow.

Conclusions

We observed a higher rate of delayed parent vessel steno-occlusive progression with Onyx HD-500 than reported despite overall low morbidity. In two cases, the stenosis involved a carotid segment separate from the aneurysm neck. The role of prolonged dual antiplatelet therapy in these patients is not clear. Quantitative vessel flow imaging was useful in management and decision-making.