Endovascular Treatment of Proximal and Distal Posterior Inferior Cerebellar Artery Aneurysms

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Introduction

Surgical clipping of posterior inferior cerebellar artery (PICA) aneurysms can be challenging and carries a potentially significant risk of morbidity and mortality. Experience with endovascular therapy has been limited to a few studies. We assess the feasibility, safety, and efficacy of endovascular therapy in the largest series of proximal and distal PICA aneurysms to date.

Methods

A total of 76 patients, 54 with proximal and 22 with distal PICA aneurysms, underwent endovascular treatment at Jefferson Hospital for Neuroscience between 2001 and 2011. Dissecting aneurysms accounted for 7.4% (4/54) of proximal aneurysms and 22.7% of distal aneurysms (5/22). Proximal PICA aneurysms were defined as aneurysms arising from the PICA-vertebral artery junction or the anteromedullary segment of the vessel. Those arising beyond the anteromedullary segment were classified as distal.

In wide-necked aneurysms or when the PICA originated from the aneurysm sac, selective endosaccular coiling was attempted before resorting to parent vessel occlusion.

Distal PICA Aneurysm

Angiogram showing a left-sided dysplastic 5 mm aneurysm arising from the distal PICA (left). The aneurysm was selectively coiled (center), and remained occluded at the 9-month follow-up angiogram (right).

Results

Endovascular treatment was successful in 52 (96.3%) patients with proximal aneurysms and 19 (86.4%) patients with distal aneurysms. Treatment consisted of selective aneurysm coiling in 60 (84.5%) patients (including 4 with stent assistance and 4 with balloon assistance) and parent vessel trapping in 11 (15.5%) patients. Specifically, a deconstructive procedure was necessary in 9.6% (5/52) of proximal aneurysms and 31.6% (6/19) of distal aneurysms.

There were 9 (12.7%) overall procedural complications, 6 (8.5%) infarcts (4 occurring after deliberate occlusion of PICA) and 3 (4.2%) intra-procedural ruptures. The rate of procedure-related permanent morbidity was 2.8%. The rate of overall in-hospital mortality was 7.0% (4/57) among SAH patients.

Complete aneurysm occlusion was achieved in 63.4% (45/71) of patients. One patient (1.4%) treated with selective aneurysm coiling suffered a rehemorrhage on post-operative day 15. Mean angiographic follow-up time was 17.2 months. Recurrence and retreatment rates were respectively 20% and 17.1% for proximal aneurysms compared with 30.8% and 23.1% for distal aneurysms.

Favorable outcomes (moderate, mild, or no disability) were seen in 100% of patients with unruptured aneurysms and 64.9% of those with ruptured aneurysms. Eleven of 26 (42.3%) patients who presented with a poor clinical grade (HH IV or V) had a good outcome (moderate, mild, or no disability) at the time of discharge.

Conclusions

Endovascular therapy is a feasible, safe and effective treatment in patients with proximal and distal PICA aneurysms, providing excellent patient outcomes and adequate protection against rehemorrhage. The long-term incidence of aneurysm recanalization appears to be high, especially in distal aneurysms, and requires careful angiographic follow-up.

Learning Objectives

By the conclusion of this session, participants should be able to:
Discuss the advantages and limitations of endovascular therapy in the treatment of PICA aneurysms.

Proximal PICA Aneurysm
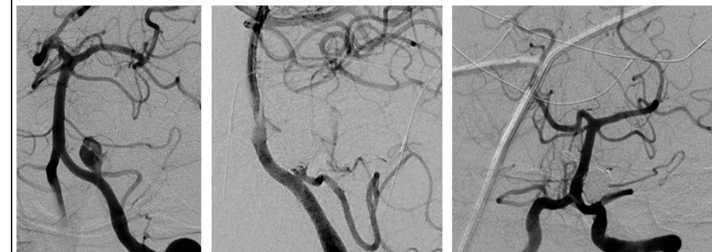
Angiogram demonstrating a large 9 mm aneurysm arising from the proximal PICA (left). Note that the PICA originates from the neck of the aneurysm. The aneurysm was successfully coiled with balloon assistance for parent vessel protection (center). The follow-up (1-year) angiogram (right) showed near-complete occlusion of the aneurysm with parent artery preservation.