

## **Pipeline Embolization Device for Small Intracranial Aneurysms: Evaluation of Safety and Efficacy in a Multicenter Cohort**

Christoph Johannes Griessenauer MD; Christopher S. Ogilvy MD; Paul M Foreman MD; Michelle Hui Juan Chua BS; Mark R. Harrigan MD; Lucy He MD; Matthew Fusco MD; J D. Mocco MD; Christopher J Stapleton MD; Aman B. Patel MD; Ashish Sonig MD MS MCh neurosurgery; Adnan Hussain Siddiqui MD, PhD; Ajith J. Thomas MD



### **Introduction**

To date, the use of the flow diverting Pipeline Embolization Device (PED) for small intracranial aneurysms (= 7 mm) has only been reported in single center series. The purpose of this study was to evaluate safety and efficacy in a multicenter cohort.

### **Methods**

Five major academic institutions in the United States provided data on patient demographics, aneurysm features, and treatment characteristics of consecutive patients with aneurysms = 7 mm treated with PED between 2009-2015.

Radiographic outcome was assessed using digital subtraction angiography. Clinical outcome was recorded as modified Rankin Scale at last follow up.

### **Results**

The cumulative number of aneurysms = 7 mm treated with PED at the five institutions was 149 in 117 patients ( $54.6 \pm 13.1$  years, male to female = 1 to 5.9). Aneurysms were most commonly located in the paraophthalmic (67.1%) segment of the internal carotid artery. Radiographic outcome at last follow up was available for 123 aneurysms (82.6%) with a complete occlusion rate of 87%. Thromboembolic and symptomatic procedural complications occurred in 8.7% and 6% of aneurysms treated, respectively. There was one mortality (0.9%) unrelated to the PED procedure. Multivariate logistic regression identified size < 4 mm, balloon angioplasty to open device, and previous treatment as predictors of procedural complications. Good clinical outcome was achieved in 96% of electively treated patients.

### **Conclusions**

In the largest series on PED for small aneurysms to date, data suggest that treatment with the flow diverting PED is safe and efficacious with complication rates comparable to traditional endovascular techniques.

### **Learning Objectives**

By the conclusion of this session, participants should be able to describe the role of flow diversion as a treatment for small intracranial aneurysms.