

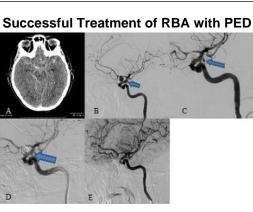
Feasibility and Safety of Pipeline Embolization Device in Patients with Ruptured Blister Aneurysms Jang W Yoon MD; Giuseppe Lanzino MD; Demetrius K Lopes MD; Roham Moftakhar MD; Joshua T Billingsley MD; Babu G Welch MD; Junichi Yamamoto MD PhD; Travis M Dumont MD; Adnan H Siddiqui MD, PhD; Elad I. Levy MD; Alan S Boulos MD; L Nelson Hopkins MD; Rabih G Tawk MD; Andrew J Ringer MD; Ricardo A Hanel MD, PhD

Introduction: Treatment of ruptured blister aneurysms (RBA) presents many challenges to neurosurgeons due to a high propensity for re-bleeding during intervention. The pipeline embolization device (PED) is a low porosity mesh approved for treatment of unruptured aneurysms larger than 10mm on the internal carpotid artery from the petrous to ophthalmic segment. The authors present a series of 11 patients treated with PED and discuss the decision making process and results of this novel application of flow diverters.

Methods: Medical records of patients who presented with RBA from May 2011 to March 2013 were retrospectively reviewed at six institutions in the United States. All relevant data points including patient demographic information, medical and medication history, initial clinical assessment, aneurysm characteristics, antiplatelet regimen, procedural characteristics, perioperative complication rates, aneurysm obliteration rates, and postoperative outcomes were independently compiled.

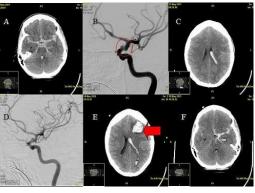
	Results										
Pt	Age/ Sex	Location	Size (mm x mm)	H 8 H	f is her	PEDs	Coils (YiN)	mRS at Day 30	Complications	Last Imaging Follow up	
1	40 F	L ICA, supracinoid	1.5 x 2	з	з	2	N	0	Sin all , asympton atic dissection flap at the L ICA	Con plete obliteration at 4 m onth DSA	
2	44 F	L IC A supraclinoid	2 × 2	2	4	1	N	6	Hen orrhagic infarct in L pre-motor area and death	NA	
3	46 F	L IC A, anterior wall	2.6 × 1.6	з	э	1	Y	1	throm bosis of stent and occlusion of carotid, EVD tract hem orthages (sm all)	Complete obliteration at 1 month on DSA	
4	33 F	L ICA, posterior well	2.0×2.0	4	3	1	N	1	Large L M C A infarct	Smallneck remnant seen at 6 month DSA	
5	46 F	L ICA, lateral wall	1.0 × 1.5	2	2	1	N	0	None	NA	
6	49 F	R ICA	2.5 × 3.2	3	2	1	N	1	None	Complete obliteration at 3 month on DSA	
7	48 F	L Con n unicating	2 × 3	1	÷.	i	N	0	None	Complete obliteration at 5 month on DSA	
0	54 F	L Con n unicating x2	3 × 2 3 × 2	5	4	1	N	2	None	Complete obliteration at 3 month on DSA	
9	19 F	L side wall comin unicating segmient and ophthalm ic segmient	3 × 2	4	2	-1	N	NA	NA	NA	
10	52 M	L ICA, Dorsal Isteral wall of supractinoid	2.96 x 1.98	3	4	2	Y	2	Complete L eye blindness	Complete obliteration at 18 month	
11	54 P	R ICA, posterior wall of ophthelm ic	2.33 x 1.04	1	a	1	N	D	None	Complete obliteration at 9 month on DSA	

Five (45%) had perioperative complications; three (27%) were major complications. None re-ruptured. None required additional treatment. 88% of patients demonstrated a complete obliteration of the aneurysm at follow-up. mRS < 2 in all 10 survivors.



 A) Initial CT, B) saccular aneurysm and blister aneurysm x 2 on LICA, C) Post coiling of saccular aneurysm, D) A PED covers the neck of all three aneurysms, E) Complete obliteration of all three aneurysms at 3 month

IPH Distant From Aneurysmal Rupture Site



A) Initial CT, B) Persistent aneurysm filling,
C) 20 hour post-op CT, D) No growth or rerupture of the aneurysm, E) A large left frontal hematoma at 24 hour post-op, F) SAH/IPH away from aneurysm **Conclusions:** This study demonstrates feasibility and safety of using PED to treat RBA with good initial results. A decision making process with proper antiplatelet regimen introduction and management is key for successful results. Dual antiplatelet-related bleeding complications seem similar to previously reported stent assisted coiling therapy studies for the same population. More cases are needed to define the precise role of flow diverters in this complex rupture aneurysm subtype.

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Learning Objectives: By the conclusion of this session, participants should be able to: 1) Appreciate the complexity and challenges of treating ruptured blister aneurysms and be aware of peri-operative complications of treating RBA with PED 2) Discuss, in small groups pros and cons of different treatment options for ruptured RBA 3) Identify PED as a feasible and safe treatment option for the ruptured blister aneurysms

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