

### Learning Objectives

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

- Describe the reengineered deployment mechanism of the second-generation Pipeline embolization device (PED)
- Discuss the incidence of delivery wire recapture failure with the Pipeline Flex device

### Introduction

The second-generation Pipeline Embolization Device (PED-Flex; Medtronic Neurovascular) has a re-engineered delivery system for simplified device deployment during treatment of cerebral aneurysms. The distal-device constraining mechanism (leaflets) have been purported to complicate PED-Flex delivery wire (PDW) recapture. In this report, we characterize the technical complexity of PDW recapture by analyzing a contemporary series of PED-Flex deployments.

### Methods

- PDW recapture details were analyzed from 65 consecutive aneurysm cases for number of recapture attempts and recapture technique employed.
- Patient and aneurysm characteristics, vessel tortuosity, procedural details, and technical outcomes were collected.

### Results

85 PED-Flexes were deployed in 65 cases.

Table 1.		
	Total	
	Count / Average (range)	% / SD
Total cases	65	
Total implanted PEDs	85	
Age	59.4 years (25-87)	± 13
Female sex	54	83%
Prior SAH	13	20%
Recurrent Aneurysm	18	28%
Previously treated	20	31%
Aneurysm size (average)	5.5 mm (1-26)	± 4
Small (<10 mm)	59	91%
Large (10-25 mm)	5	8%
Giant (>25 mm)	1	2%

Demographic and baseline anatomic characteristics.

- Significant cervical carotid tortuosity and moderate to severe cavernous tortuosity (cavernous grade =2) was present in 23% and 55% of cases, respectively.
- Technical success of PDW recapture and PED-Flex implantation was achieved in 100% of cases
- The overall major complication rate was 3% (n=2), with one minor stroke and one mortality (both procedure-related hemorrhages).

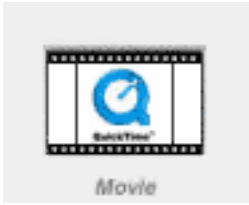
### Results

A unique grading scale was utilized to characterize the recapture of the PDW with the delivery microcatheter after all PED deployments.

#### PDW Recapture Grading Scale

- Grade I: Recapture on first attempt
- Grade II: Recapture with multiple attempts
- Grade III: Recapture, requiring a mated, single-unit withdrawal of the PDW and microcatheter
- Grade IV: Failure to retrieve PDW

Table 2. Pipeline delivery wire recapture grade.		
	Total	
	Count	%
Total cases	65	
Total implanted PEDs	85	
Grade I	82	96.5%
Grade II	2	2.4%
Grade III	1	1.2%
Grade IV	0	0



**Video 1.** Recapture Grade III of Pipeline delivery wire during Pipeline embolization of a right internal carotid artery ophthalmic segment aneurysm.

### Conclusions

Recapture of the PED-Flex delivery wire can be performed both reliably and safely. Loss of endoluminal delivery catheter access during recapture is a rare occurrence that does not affect procedural success.

### References

Mooney MA, Moon K, Gross BA, Ducruet AF, Albuquerque FC. Incidence of delivery wire recapture failure with the Pipeline Flex device. *J Neurointerv Surg* 2017;9:571-573.