

# Direct Carotid Exposure for Aneurysm Embolization with the Pipeline Embolization Device

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## Introduction

Direct cervical carotid exposure for endovascular access provides a means of bypassing difficult anatomy of the aortic arch or proximal brachiocephalic vessels in those patients with cerebrovascular anomalies most amenable to endovascular therapy, while additionally providing the security of a direct visualization of the arteriotomy closure in the setting of a mandatory antiplatelet regimen.

## Case Report

### Background

An 82-year-old female initially presented five years prior with a ruptured right posterior communicating artery aneurysm, which was treated with standard coil embolization. She ultimately required a VP shunt, but otherwise recovered well from her hemorrhage. She returned a year later with radiographic evidence of aneurysm regrowth, which was treated by stent-assisted coiling. She returned in 2015 with significant aneurysm regrowth. Due to the tortuosity of her proximal vasculature, we proceeded with direct carotid exposure for access in order to proceed with coil and pipeline embolization.

### Technical Description

Before the procedure, the patient was continued on her daily regimen of aspirin 325mg and clopidogrel 75mg.

### Carotid exposure and isolation

In the OR, the patient was placed under GETA, and she was positioned supine, with her head turned to the left for a right-sided carotid exposure. A straight incision was made along the anterior edge of the sternocleidomastoid. Dissection was carried down through the platysma and investing fascia. The carotid sheath was opened over the long axis of the CCA. The CCA was isolated and two vessel loops were placed, distally and proximally. These were placed in the cavity and the incision closed in layers. She was extubated and taken to the ICU. She was continued on her dual antiplatelet regimen.



DSA showing regrowth of right posterior communicating artery aneurysm

### Endovascular portion

In the IR suite, the incision was reopened. The right ICA was accessed with direct microstick and exchanged for a 5Fr short groin sheath. An angiogram revealed a partially-coiled, narrow-necked aneurysm on the dorsal wall of the supraclinoid ICA, with the regrown portion measuring 1.2 x 1cm. Next, a microstick outer cannula with a Flexor Tuohy-Borst was used as an introducer, and a Prowler 10 with X-pedion 10 microwire was used to cannulate the aneurysm, and embolization with bare platinum coils was performed. Next, the microcatheter and sheath were exchanged for a Navien 058. A Marksman microcatheter was introduced, and then a 14 wire. The Navien was driven into the distal ICA, and the Marksman was passed into the distal right M1 segment. The wire was withdrawn. Next, a 4.25 x 14 Pipeline embolization device was advanced over a guidewire into the proximal MCA. It was unsheathed, with the proximal portion just proximal to the takeoff of the ACA. A final DSA was performed, confirming stagnant flow within the aneurysm. After all catheters and the sheath were removed, the vessel loops around the ICA were used to briefly arrest flow in the ICA. Two 6-0 Prolene sutures were used to close the defect in the carotid. The vessel loops were removed, and then wound closed in standard fashion.

### Post-operative course

The patient tolerated the procedure well. She was discharged home on post-operative day 1, and continued on her dual antiplatelet regimen. At her thirty-day follow up, the patient remained at her neurological baseline and was doing well.

## Conclusion

Surgical exposure of the cervical carotid artery may be safely utilized as a means of providing vascular access for deployment of Pipeline embolization device in patients for whom the standard transfemoral approach is not feasible.

Image 2



Lateral angiogram showing coiled aneurysm mass with deployed Pipeline device