

Percutaneous direct carotid approach using the hyperflexible large-bore Navien distal intracranial catheter for treatment of anterior circulation aneurysms

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Introduction

Direct percutaneous carotid artery puncture (DPCAP) enables endovascular treatment of cerebral aneurysms that are otherwise untreatable in patients with non-navigable proximal vessel tortuosity. Traditionally, microcatheters were advanced directly through the carotid sheath to the intracranial target. This method is insufficient for complex modern neurointerventions necessitating robust, distal large-bore intracranial support.

Methods

We retrospectively reviewed all neurointerventions performed by the senior author to identify all aneurysms treated via DPCAP with utilization of the 5F 0.058-inch inner diameter Navien distal intracranial catheter. Procedural data collected include proximal tortuosity, intra-procedural Navien position, and peri-procedural complications.

Results

DPCAP was used in 4 neurointerventions for these reasons: bilateral iliofemoral occlusion (n=1), and failed transfemoral embolization secondary to severe tortuosity of arch/supra-aortic vasculature (n=3). Mean patient age was 73.5 years (range 67-80). All treatments were for anterior circulation aneurysms (A2-3, n=2 and ophthalmic, n=2). Intra-procedural Navien position along the internal carotid artery were as follows: petrous (n=1), petrocavernous (n=1), posterior genu of cavernous (n=1), and supraclinoid (n=1). All neurointerventions (coil embolization, n=2; stent-assisted coiling, n=1; Pipeline embolization, n=1) were successful. No complications occurred during carotid puncture, Navien positioning, and aneurysm embolization. Two cervical hematomas were observed without significant adverse sequelae. All patients were discharged home at their pre-procedure neurological baseline.

Conclusions

For neurointerventions of anterior circulation cerebral aneurysms in patients with complex proximal vasculature tortuosity, DPCAP remains an effective technique. Use of the Navien catheter greatly enhances this approach by providing large-bore distal intracranial support necessary for modern neurointerventions, such as Pipeline embolization.

Learning Objectives

By the conclusion of this session, participants should be able to 1) Discuss patient characteristics in which the direct percutaneous carotid access technique may be used, and 2) Identify the advantages of using the Navien distal intracranial catheter with the direct carotid access approach.