

Direct V1 segment vertebral artery surgical exposure and cannulation for endovascular coil embolization of ruptured basilar apex aneurysm.

Sadashiva Karanth MBBS; Sean Meagher MD; Kenneth Fraser MD; Jeffrey Klopfenstein MD

Department of Neurosurgery and Interventional Neuroradiology
Illinois Neurological Institute, Peoria, Illinois



Introduction

Vertebral artery osteal stenosis, hypoplasia, or proximal tortuosity when present bilaterally can preclude catheter access via the conventional transfemoral approach. Described is a novel technique for selective cannulation of the vertebral artery V1 segment by direct open surgical exposure in a patient with high surgical morbidity with ruptured basilar bifurcation aneurysm.

Methods

A 75- year-old female with mechanical aortic valve requiring anticoagulation presented with ruptured 6 mm basilar bifurcation aneurysm. Digital subtraction angiogram revealed a hypoplastic right vertebral artery and a tortuous proximal left vertebral artery preventing selective cannulation for intervention (Fig. 1). Upon multidisciplinary review, it was concluded that direct surgical access of the vertebral artery for endovascular management was superior to craniotomy for clip occlusion of the aneurysm given the patient’s anticoagulation requirements for her mechanical heart valve.



Fig. 1 DSA demonstrating tortuous V1 segment



Fig. 2 Proposed supraclavicular incision

Technique

A transverse incision was placed an inch above the medial 1/3rd of clavicle (Fig. 2). Upon excision of sternal head of sternocleidomastoid, the internal jugular vein was retracted laterally to expose the V1 segment of vertebral artery. An access sheath was inserted into the V1 segment under direct visualization (Fig. 3). Successful coil embolization then was carried out in the angiography suite and the patient subsequently was taken back to the operating room for removal of the sheath under direct visualization. A small, asymptomatic dissection occurred during sheath placement presumably due to the limited access angle to the artery created by the

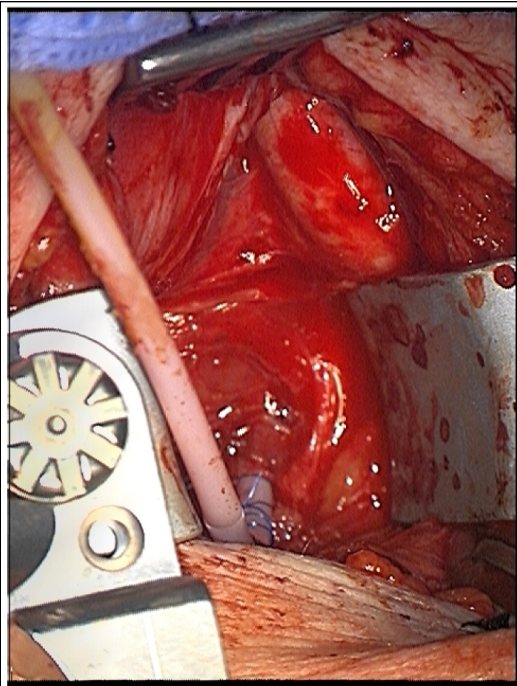


Fig. 3 Access sheath inserted into V1 segment

position of the clavicle in relation to the V1 segment.

Conclusions

When conventional transarterial routes are unavailable and yet endovascular management is deemed markedly superior to open surgery for management of posterior circulation pathology, the V1 segment of vertebral artery can be exposed surgically and cannulated effectively for endovascular intervention.



Fig. 4 Access sheath exiting cervical wound upon insertion into V1 segment after direct cannulation.