Direct suction decompression and fenestrated clip reconstruction of complex paraclinoid carotid artery aneurysm: operative video and nuances of skull base technique

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Direct microsurgical clipping of complex paraclinoid carotid artery aneurysms remains a formidable technical challenge due to the aneurysm’s deep location at the skull base, with adjacent bony anatomy, large size, wide neck, and complex neuroanatomical relationships. In this operative video atlas manuscript, the author demonstrates a step-by-step technique for microsurgical clip reconstruction of a large complex ventral paraclinoid carotid artery aneurysm, using a trapping and direct suction decompression strategy followed by multiple fenestrated clip reconstruction of the internal carotid artery (ICA) via a modified orbitozygomatic approach. The nuances of skull base techniques are illustrated including extradural optic nerve decompression, extradural anterior clinoidectomy, incision of the falciform ligament to untether the optic nerve, and release of the distal dural ring to obtain proximal control. Reconstruction of the ICA and preservation of the anterior choroidal artery were achieved with multiple fenestrated clips. Aneurysm obliteration and patency of flow through the ICA was confirmed on video indocyanine green and catheter angiography. Although novel endovascular strategies continue to evolve, these microsurgical skull base techniques should remain in the surgical armamentarium for treating these complex cranial base vascular lesions.

The video can be found here: http://youtu.be/lPS6lsk1ds.

KEYWORDS complex cerebral aneurysm; ventral paraclinoid aneurysm; suction decompression; fenestrated clip reconstruction; skull base surgery; trapping; operative video