

Internal Maxillary Artery to MCA bypass: infratemporal approach to the Internal Maxillary Artery. Erez Nossek MD; Peter Costantino; Mark B. Eisenberg MD; David J. Langer MD Lenox Hill Hospital, North-Shore LIJ Health System



Introduction

Internal maxillary artery (IMax) - to -Middle cerebral artery (MCA) has been recently described as an alternative to cervical EC-IC bypass. This technique utilized a "key hole" craniectomy in the temporal fossa floor that requires a technically challenging end-to-side anastomosis. We describe a lateral subtemporal craniectomy of the middle cranial fossa floor to facilitate wide exposure of the IMax.

Methods

Orbito-Zygomatic osteotomy was used followed by fronto-temporal craniotomy and subsequently lateral temporal fossa craniectomy reaching its medial border designated by a virtual line connecting foramen rotundum and foramen ovale. The IMax was identified by anatomical landmarks, neuronavigation and/or microdoppler. Proximal anastomoses were performed by either end-to-side or end-to-end fashion. We additionally studied the approach and internal maxillary artery anatomy in a cadaveric specimen.



Contemplated IMax-to-MCA bypass. The light blue arrow demonstrates the location of the bypass.



The red area demonstrates the contemplated craniectomy of the middle cranial fossa floor to unroof the infratemporal fossa. The craniectomy will reach a line 2 mm lateral to the line between the f. ovale and f. rotundum.



Proximal end-to-end anastomosis and a permanent clip on the distal IMax artery. Distal end-to-side anastomosis to the M3.

Results

There were four cases in which the technique was utilized. One bypass was performed as flow augmentation for hypoperfused hemisphere. The other three were performed due to MCA giant aneurysms. A vein graft was used in all patients. One patient was proximally anastomosed as end-to-side while the other three patients were done as end -to-end anastomoses. Intraoperative flow using the Transonic flow probe ranged from 20-60 cc/min. Post operative angiography demonstrated good filling of the graft with robust distal flow in all cases. All patients tolerated the procedure well.



The craniectomy is done up to the virtual line 2 mm lateral to V2 and V3 entering foramen rotundum and foramen ovale respectively (thin arrows). The IMax artery is dissected in the



Intraoperative craniectomy of the middle cranial fossa floor



IMax in the infratemporal fossa.



Proximal end-to-end anastomosis. Permanent clip on distal Imax.



Post op CT 3D- The graft bypassing through the floor of the middle cranial fossa.

Conclusions

The IMax-to-MCA, Subcranial to Intracranial (SC-IC) bypass is safe and effective. The lateral temporal fossa craniectomy technique resulted in reliable identification and wide exposure facilitating easy access to the IMax artery.



CCA injection demonstrates patent bypass and filling of the entire hemisphere.



Final result demonstrates the vein graft emerging from the infratemporal fossa into the Sylvian fissure in the same operative field.