

Accepted Manuscript

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PII: S1878-8750(17)31890-9

DOI: [10.1016/j.wneu.2017.10.162](https://doi.org/10.1016/j.wneu.2017.10.162)

Reference: WNEU 6815

To appear in: *World Neurosurgery*

Received Date: 19 April 2017

Revised Date: 26 October 2017

Accepted Date: 27 October 2017

Please cite this article as: Cıkla U, Mukherjee D, Başkaya MK, Overcoming End-to-End Vessel Mismatch During STA-Radial Artery-M2 Interposition Grafting for Cerebral Ischemia: The Tapering Technique, *World Neurosurgery* (2017), doi: 10.1016/j.wneu.2017.10.162.

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**Overcoming End-to-End Vessel Mismatch During STA-Radial Artery-M2 Interposition Grafting
for Cerebral Ischemia: The Tapering Technique**

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All authors declare no conflict of interest.

ACCEPTED MANUSCRIPT

Overcoming End-to-End Vessel Mismatch During STA-Radial Artery-M2 Interposition Grafting for Cerebral Ischemia: The Tapering Technique

Cerebral revascularization procedures, such as the external carotid-internal carotid bypass, have been used in the clinical management of cerebral ischemic states. Among the most commonly performed bypasses include the superficial temporal artery-middle cerebral artery (STA-MCA) bypass to restore the cerebral blood flow. In cases of a foreshortened STA donor vessel, a radial artery (RA) graft is often used as an interposition graft between the STA and MCA. However, addressing the vessel size mismatch between the radial artery and donor can be problematic and challenging.

We present the case of an 80-year-old male presenting with positional onset expressive aphasia and right-sided hemiparesis. CT perfusion demonstrated a diffusion-perfusion mismatch in a left MCA distribution. Angiography showed a complete left internal cerebral artery occlusion and poor distal filling of the STA. We performed an EC-IC bypass through interposing an RA graft to the STA proximally with an end-to-end anastomosis and to the MCA distally using an end-to-side anastomosis. The mismatch between two bypass vessels size was corrected by removing a small piece from the RA graft at one margin and suturing it to itself to reduce its size of the RA vessel diameter opening on the side used to sew to the STA.

The patient did well clinically with improved right-sided strength, a patent graft, and no post-operative complications.

Addressing vessels mismatch when using RA interposition grafts for bypass is challenging. Various operative approaches to address mismatch should be individualized based on the particular vascular anatomy and needs of the case. Nevertheless, our method of cutting and suturing one side of the RA graft into a semi-blind end to match donor vessel diameter may be of use to cerebrovascular surgeons in select cases.

Abbreviations:

STA: Superficial temporal artery

MCA: Middle cerebral artery

STA-MCA : Superficial temporal artery to Middle cerebral artery

EC-IC: External carotid artery to Internal carotid artery

RA: Radial artery

CT: Computerized Tomography