Extra-Femoral Access (Trans-Radial or Trans-Cervical Carotid) for Mechanical Thrombectomy for Acute Ischemic Stroke: A Systematic Review and Meta-Analysis

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Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of timely recanalization in AIS treatment for outcomes 2) Identify alternative/extra-femoral methods for access in mechanical thrombectomy

Introduction

The standard trans-femoral artery (TFA) approach for access for mechanical thrombectomy in patients presenting with acute ischemic stroke (AIS) often proves difficult and can delay recanalization, leading to less favorable outcomes. Aortic arch tortuosity represents a common cause for this delay. There are a growing number of case series using transradial artery (TRA) and/or transcervical carotid artery (TCCA) access demonstrating these methods to be safe with low rates of post-procedural morbidity.

Methods

A systematic review and meta-analysis were performed in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Articles were identified through the Ovid Medline and Web of Science databases from inception to March 2018, as well as our center's unpublished data.

Results

Eleven studies encompassing 51 patients were included (all observational cohorts). Initial NIHSS score ranged from 1-36, average 17.6. 39 (76%) patients suffered from anterior circulation versus 12 posterior circulation occlusions. Access site included 26 (51%) radial artery punctures, 23 (45%) percutaneous cervical-carotid punctures, 1 brachial and 1 direct vertebral artery puncture. The average time from symptom onset to first pass/recanalization was 387.6 minutes (n=33, 95%CI 310.6-464.6). The average puncture to recanalization time was 40.7 minutes (n=41, 95%CI 32.7-48). Technical success defined as TICI score of 2b or greater - achieved in 43/51 (84%) of patients. There were no documented complications in patients who underwent TRA access and only 2 (8.7%) treated via TCCA access developed hematomas, one resolved with conservative management.

Conclusions

This study summarizes the best available evidence for alternative access in interventional AIS treatment, and demonstrates the safety and success possible with TRA or TCCA catheterization. Guidelines to prospectively identify patients that will need extra-femoral access, development of devices tailored for alternative access, and further standardization of these techniques will be indispensable for significant advancements in the field.

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