Value and Safety of Intracranial Imaging During Transcarotid Artery Revascularization

Peter L Faries, Christopher M Faries, Justin M George, Kelsey Berger, Peter V Cooke, Rami O Tadros, Michael L Marin

Icahn School of Medicine at Mount Sinai
New York, NY

Mount Sinai

Disclosures

- None

Introduction

- The pivotal ROADSTER trial reported an incidence of CVA of 1.4%
- Similar event rates in the subsequent Roadster trials and in the VQI registry have been confirmed
- The risk of CVA during TCAR is low, but is still present and results in significant clinical sequelae

Background

- TCAR is performed under general anesthesia in 79% of cases which limits the capacity for intraprocedural neurological evaluation
- The IFU for TCAR does not currently include intracranial imaging to identify complications such as cerebral embolization
- Intraprocedural intracranial imaging has the potential to dramatically improve time to neuro-rescue if an embolic event is identified
- Intraprocedural identification would be particularly useful in patients with challenging common carotid artery access

Background

- Intraprocedural cerebral angiography allows for assessment of patency of the Circle of Willis to evaluate the adequacy of collateral perfusion
- The patency of collateral circulation has the potential to influence the impact of the duration of flow reversal on the risk of cerebral ischemia

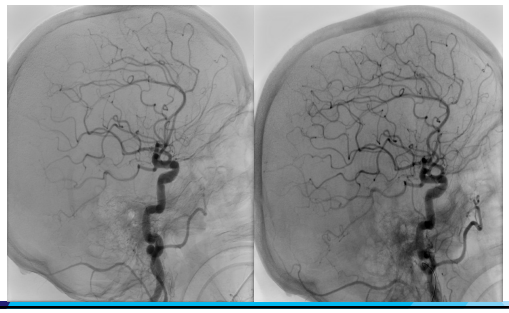
Objective

- This study aims to demonstrate the feasibility, utility and safety of intracranial cerebral angiography during TCAR

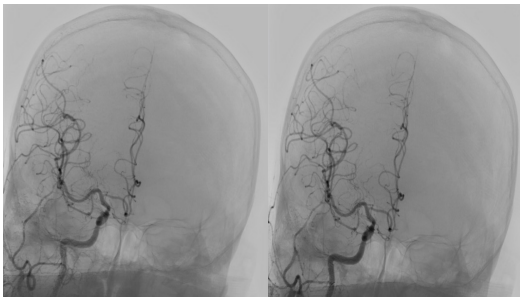
Methods

- A single center pilot program was created to prospectively assess the feasibility of intracranial imaging during TCAR
- 147 consecutive patients were enrolled from September 2013 to November 2024
- The primary outcome was technical success of the imaging procedure

Lateral View



Towne's View



Results: Demographic Characteristics

Characteristic	% (N)
Age (years)	74 ± 11
Male	82% (109)
Diabetes	43% (57)
Hyperlipidemia	90% (117)
Hypertension	86% (114)
Coronary Artery Disease	58% (77)
Peripheral Arterial Disease	42% (56)
Renal Insufficiency	31% (41)

Results: Indications

Indication	
Symptomatic Carotid Disease	46%
Unfavorable Surgical/Transfemoral Anatomy	52%
High Operative Risk	42%
Neck Irradiation	3%

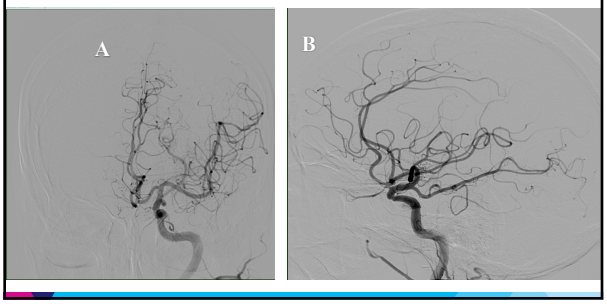
Results: Intraprocedural Characteristics

Characteristic	
Flow Reversal Time (min)	11.9 ± 4.9
Total Procedure Time (min)	105.5 ± 26.3
Successful Intracranial Imaging	100.0%
Patent Anterior Communicating Artery	62%
Patent Posterior Communicating Artery	36%
Periprocedural CVA	0.0%
Periprocedural MI	0.0%
30-Day Mortality	0.0%

Results: Complications

Complication Type	N (%)
Cervical Hematoma	4 (2.7%; 1 ETT, 0 RTOR)
Access site injury of the CCA	2 dissections – 1 stented (1.3%)
Restenosis Reintervention	1 (0.68%)

Towne's (A) and Lateral (B) Views



Conclusions

- Intracranial imaging prior to and after flow reversal is both safe and feasible during TCAR and was performed successfully in all 147 patients.
- Flow reversal times in this study were comparable to those reported in the ROADSTER clinical trials without intracranial imaging.
- Collateral perfusion of at least 1 communicating vessel was demonstrated in 72% of patients.
- Intracranial cerebral angiography during TCAR has the potential to identify embolic complications, provide more rapid treatment, and avoid challenging access anatomy.