StenTing foR ischemic strokes secondary to medIcally refraCTory IntraCranial atherosclerotic diSease: STRICT-ICAS

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Study Title: StenTing foR ischemic strokes secondary to medIcally refraCTory IntraCranial atherosclerotic diSease: STRICT-ICAS

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Collaborators: up to 10 centers.

Background and Rationale

Intracranial atherosclerotic disease (ICAD) accounts for approximately 10% of ischemic strokes in the United States and is a major cause of recurrent strokes. Although three randomized controlled trials (RCT) have failed to show the benefit of endovascular treatment [1-3], there exists a subset of patients who experience recurrent strokes despite maximum medical therapy. These patients may benefit from Percutaneous Angioplasty and Stenting (PTAS), especially when selecting flow-related stroke subtypes rather than perforator or embolic strokes or patients with recurrent transient ischemic attacks. A follow-up post-market surveillance study mandated by the FDA to evaluate peri-procedural safety of the Wingspan Stent (Stryker, Kalamazoo, MI) demonstrated reduced perioperative stroke and death rates, further suggesting that patients could benefit from PTAS.[4] The experience of neurointerventionalists and proper patient selection were the main reported factors for a lower periprocedural stroke and death rate in the WEAVE trial in comparison to the SAMMPRIS trial.

The practice pattern of endovascular treatment for medically refractory ICAD has been evolving since the publication of the WEAVE trial with an increasing off-label utilization of balloon-mounted coronary stents or other self-expanding stents. Since the publication of the three negative RCTs, there has been a lack of prospective data regarding current endovascular practice patterns for ICAD. There is likely variation in patient selection, timing of intervention, and devices used. Analyzing these may provide insight into optimal practices for the endovascular treatment of ICAD and the design of future trials.

Study Purpose: Establish a prospective multicenter registry of the patients undergoing intracranial stenting for ischemic strokes caused by medically refractory ICAD to evaluate current practice pattern, periprocedural and delayed outcomes.

Study Design: Prospective, multicenter, single arm, observational study

Study Population: Consecutive patients with ischemic strokes caused by medically refractory ICAD undergoing intracranial stenting, and meeting study inclusion criteria will be included.

Study Intervention/Product and its Intended Use: Participating centers will follow their standard of care protocols for intracranial stenting for medically refractory ICAD. We will not advertise use of any specific on-label or off-label device for intracranial stenting. No new products will be studied or promoted.

Study Duration: 2 years

Inclusion Criteria (adopted from [4])

- Adult patients with ICAD resulting in 70-99% vessel stenosis who undergo PTAS with any device will be included.
- Patients will have to experience a stroke despite medical management involving risk factor modification and an antiplatelet agent.
- Baseline modified Rankin Scale (mRS) ≤ 3
- Performance of the endovascular procedure at least 3 days after the last stroke.

Exclusion Criteria:

- Large vessel occlusion strokes undergoing rescue intracranial stenting will not be included
- Baseline modified Rankin Scale (mRS) >3
- Performance of the endovascular procedure less than 3 days after the last stroke.
- Patients undergoing intracranial stenting for first stroke caused by ICAD
- Adult patients with ICAD resulting in <70% vessel stenosis

Objectives and Endpoint:

Aim 1: To establish a prospective multicenter registry evaluating current endovascular practice patterns of patients undergoing PTAS for medically refractory ICAD.
Hypothesis 1: A variety of devices besides the Wingspan stent system (Stryker Neurovascular, Fremont, CA, USA) will be used for PTAS, including off label use of coronary balloon-mounted stents or Neuroform atlas stents

Aim 2: To establish a prospective multicenter registry evaluating current periprocedural and delayed outcomes for PTAS in patients with medically refractory ICAD.

Hypothesis 2a: The periprocedural stroke, bleed, and death rate will be similar to that published in the WEAVE trial.[4]

Hypothesis 2b: The 1-year follow-up rates of stroke within the target artery territory, non-traumatic hemorrhage, or neurologic death will be similar to that published in the WOVEN trial.[5]

Outcomes:

The primary outcomes will include:

1. Recurrent ischemic stroke within the territory treated, intracranial hemorrhage, or death within 72 hours after the procedure. All of the patients enrolled in the trial will be assessed at 72 hours post-stenting either in the hospital by the study interventionalist or, if the patient had already been discharged home, by telephone interview by a core study nurse or interventionalist

2. Stroke within the territory treated, intracranial hemorrhage, or neurologic death within 6 months to 1 year after PTAS. All the patient enrolled in the trial will undergo
   - Follow up clinic visit between 6 months to 1 year per standard of care
   - Follow up vascular imaging (modality of imaging will be decided based on standard of care at participating centers)

3. Secondary outcomes will include-
   - Stent patency on follow up vascular imaging
   - Re-stenosis ≥ 70% on follow up vascular imaging

- mRS between days 180-360 after the procedure
- Any death within 1 year after the procedure
- Myocardial infarction within 72 hours after the procedure.

Variables collected

Age, sex, race, comorbidities (hypertension, hyperlipidemia, diabetes, coronary artery disease), smoking status, baseline mRS, affected artery, number of prior strokes attributable to target lesion, type of stroke (embolic, borderzone, perforator, etc.), degree of stenosis of target lesion, Mori classification, medical management for ICAD, type of antiplatelets, P2Y12 test value, aortic arch type, proximal tortuosity, collaterals, device used for PTAS, plaque anatomy, diameter of proximal and distal vessels, type of anesthesia, intraprocedural blood pressure, use of anticoagulation or IV antiplatelet therapy intraprocedurally, clinical status at 72 hours, periprocedural antiplatelet regimen, intraprocedural and post procedural complications, degree of residual stenosis, follow up vascular imaging data between 6-12 months post procedure, follow up clinical data between 6-12months post procedure.

Sample Size: 150 patients

Safety Considerations and Adverse Event Reporting: Will be done according to standard of care at participating centers

Ethics and Regulatory Consideration: IRB approval will be taken at all participating centers. We will encourage centers to request waiver of informed consent process as we will be obtaining deidentified data regarding current practice pattern by following standard of care at participating centers.

Data Management: Participating centers will provide data through REDCap. Study coordinator at Semmes Murphey Foundation will manage the REDCap database and keep it secured with access only to principal investigators and key study personnel.

Publication Plan: JAMA or JAMA Neurology. Sequence of co-authorship will be decided based on level of contribution from participating centers. Will aim for 2 co-authors from each center.

Imaging Core Lab: New England Imaging Core Lab

Bibliography:

1. Gao P, Wang T, Wang D, Liebeskind DS, Shi H, Li T, et al. Effect of Stenting Plus Medical Therapy vs Medical Therapy Alone on Risk of Stroke and Death in Patients With Symptomatic Intracranial Stenosis: The CASSISS Randomized Clinical Trial. JAMA. 2022;328(6):534-42. doi: 10.1001/jama.2022.12000.
2. Derdeyn CP, Chimowitz MI, Lynn MJ, Fiorella D, Turan TN, Janis LS, et al. Aggressive medical treatment with or without stenting in high-risk patients with intracranial artery stenosis (SAMMPRIS): the final results of a randomised trial. Lancet. 2014;383(9914):333-41. doi: 10.1016/S0140-6736(13)62038-3.
3. Zaidat OO, Fitzsimmons BF, Woodward BK, Wang Z, Killer-Oberpfalzer M, Wakhloo A, et al. Effect of a balloon-expandable intracranial stent vs medical therapy on risk of stroke in patients with symptomatic intracranial stenosis: the VISSIT randomized clinical trial. JAMA. 2015;313(12):1240-8. doi: 10.1001/jama.2015.1693.
4. Alexander MJ, Zauner A, Chaloupka JC, Baxter B, Callison RC, Gupta R, et al. WEAVE Trial: Final Results in 152 On-Label Patients. Stroke. 2019;50(4):889-94. doi: 10.1161/STROKEAHA.118.023996.
5. Alexander MJ, Zauner A, Gupta R, Alshekhlee A, Fraser JF, Toth G, et al. The WOVEN trial: Wingspan One-year Vascular Events and Neurologic Outcomes. J Neurointerv Surg. 2021;13(4):307-10. doi: 10.1136/neurintsurg-2020-016208.