2022 MID-ATLANTIC CONFERENCE

10th ANNUAL CURRENT CONCEPTS IN VASCULAR THERAPIES

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Timing of Carotid Revascularization after Ischemic stroke

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Timeline of Ischemic Stroke Care

First 24h:

- Reperfusion
  - Thrombolytics
  - Thrombectomy
- Permissive Hypertension
- Antithrombotics
- Prevent Aspiration

24-72h:

- Mitigate fever >99.6F
- Manage ICP
  - Osmotherapy
  - Craniectomy
- Tailor secondary prevention plan
- Prevent Aspiration

>72h

- Rehabilitation plan
- Continued secondary prevention

Onset

Cervical Carotid Atherosclerosis

- Moderate to severe stenosis (50-99%) is present in 1-3%
- Accounts for 15-20% of ischemic strokes
- High recurrence risk after ischemic symptoms
  - 27% within 2 weeks after TIA or mild stroke
  - 20% within first 72h
  - Note recurrence risk may be lower with modern maximal medical therapy
- Potential early perioperative risks of revascularization:
  - Unstable plaque increasing distal embolization
  - Hemodynamic fluctuations in setting of residual penumbra
  - Reperfusion injury to friable tissue
  - Note changing landscape of surgical techniques to reduce embolization
- Optimal timing to balance risk/benefits has been a moving target

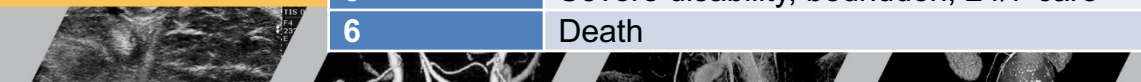
Ois et al. Stroke 2009
Tsantilas et al. J Cardiovasc Surg 2015

Yee et al J Med Cases 11(1): 12-15

Benefit of Carotid Endarterectomy (CEA)

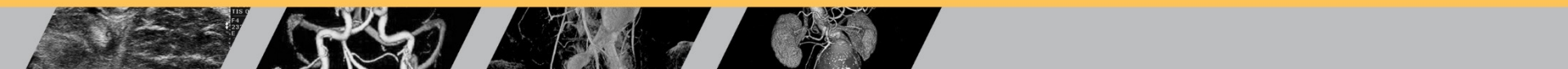
- Benefit for >50% stenosis within 6 months established by 3 RTCs
  - European Carotid Surgery Trial (Lancet 1998)
  - North American Symptomatic Carotid Endarterectomy (N Engl J Med 1998)
  - Veterans Affairs Cooperative Studies 309 Program (JAMA 1991)
- In >70% stenosis, approx. 11-17% absolute risk reduction
- Note included mRS 0-2

Score	Functional status
0	No symptoms
1	Symptoms, no disability
2	Slight disability, mostly independent
3	Moderate disability, needs some help but ambulatory
4	Moderate-to-severe disability, substantial help ADLs, non-ambulatory
5	Severe disability, bedridden, 24/7 care
6	Death



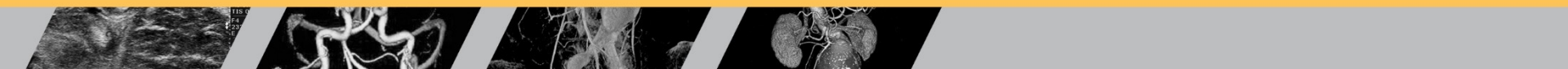
Benefit of Early Surgery

- Rothwell et al, Lancet 2004 - pooled analysis of ECST and NASCET
- 5893 patients, 3157 surgeries
- 30 day perioperative stroke/death 7%
- In >70% stenosis, 30% risk reduction when surgery done <14 days, 17.6% between 2-4 weeks, 11% between 4-12 weeks, 9% >12 weeks
- In 50-69% stenosis, no benefit after 2 weeks
- In 2006, AHA recommended CEA < 2 weeks

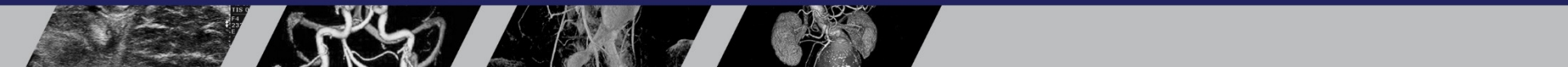


How Early is Too Early?

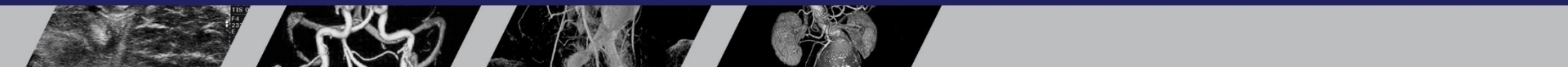
- Swedish Vascular Registry 2,596 CEAs, compared timing 0-2 days, 3-7 days, 8-14 days, 15-180 days (Stromberg et al. Stroke 2012)
  - 30-day Stroke/death 11.5% in 0-2 day group, 3.6-5.4% in other groups
  - Odds of stroke/death 4x greater 0-2 days compared to 3-7 days
- Similar results in:
  - Nordanstig et al. Eur J Vasc Endovasc Surg 2017
  - Avgerinos et al. J Vasc Surg 2017
  - Tanious et al. Ann Surg 2018
  - Hasan et al. J Vasc Surg 2022
  - Cui et al. J Vasc Surg 2021 (THIS WAS A TCAR STUDY)



- Following intravenous thrombolysis
  - Brinster and Sternbergh J Cardiovasc Surg 2020; reviewed 21 published reports, 1,165 cases
  - Generally safe <2 weeks
  - However, caution within first 72h



- Society for Vascular Surgery 2022 Guidelines
  - Stable stroke, mRS 0-2, >50% stenosis
    - CEA recommended between 48h and 14 days
    - CEA preferred over transfemoral CAS within 2 weeks (higher ischemic stroke risk)
  - Avoid revascularization with disabling stroke, mRS 3-5, >30% of ipsilateral MCA territory, altered consciousness



Any Exceptions to 48h delay?

- Stuttering (crescendo)TIA presentations
  - Recurrent ischemic events 1.1% with CEA <48h compared to 11.1% later, Pini et al. Vascular 2019
  - Possible benefit supported in review by Fereydooni et al JAMA 2019
- Emergent CEA or CAS may provide benefit in Tandem Occlusions
  - Ongoing trials TITAN and EASI-TOC
  - Supportive results in:
    - Zhu et al Front Neurol 2019
    - Marko et al. NeuroIntervent Surg 2021
    - Andani et al. Stroke 2021, roughly 9% increase in good functional outcome (mRS 0-2) and 13% chance excellent outcome (mRS 0-1)