A New System For Stroke Prediction in ACS Patients:
When is Invasive Treatment ( CEA / CAS ) Mandatory and Justified ?

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Legacy Studies on Asymptomatic Carotid Stenosis

These RCTs showed the benefit of CEA in patients with ACS. However these results are based on a very low ARR and high NNT. These pivotal studies were also conducted when best medical therapy was not as effective as now with increasing use of statins and newer antiplatelet agents.

Guidelines for Repair of Asymptomatic Carotid Stenosis

Despite these limitations and shortcomings, the guidelines of the AAN, AHA & ESVS concur with the SVS:

“Neurologically asymptomatic patients with 60% diameter stenosis should be considered for CEA for reduction of long-term risk of stroke, provided the patient has a 3- to 5-year life expectancy and perioperative stroke/death rates can be 3% (GRADE 1, Level of Evidence A).”

Controversy on Asymptomatic Carotid Stenosis

“Therefore, best evidence now indicates that common-place, current vascular disease medical intervention is now as effective in preventing stroke and TIA associated with this lesion as the combination of medical intervention and CEA used in past randomized surgical trials.”

“In conclusion, current vascular disease medical intervention alone is now best for stroke prevention associated with asymptomatic severe carotid stenosis given this new evidence, other cardiovascular benefits, and because high-risk patients who benefit from additional carotid surgery or angioplasty/stenting cannot be identified.”

Study Population on ACS

Between 2009-2015, patients with asymptomatic carotid stenosis identified by ICD-9 code 433.10

- 80-99% Stenosis: EDV >140 cm/sec
- Asymptomatic: No INS 6 months prior to the index DUS
- INS: Ipsilateral Neurologic Symptoms ( TIA or CVA )
- OMT: ASA or Clopidogrel + Statin ( only 64.2% patients)
Natural History of high grade ACS

- Over mean follow up 1.3 year, There were 9 (11.1%) INS (8 CVA & 1 TIA)
- Risk of INS was 5.8% for patients on OMT, and 20.7% for patients not on OMT

Risk Factors for INS in ACS

Demographics and Comorbidity Impact on Ipsilateral Neurologic Symptoms

Risk Factors for INS in ACS

Impact of Medical Therapy on INS

Multivariate regression analysis found that only EDV > 200 cm/s was independently associated with risk for ipsilateral TIA or ischemic CVA (odds ratio: 15.75; 95% confidence interval: 1.247-198.7; P=0.033)

Predictive Model for INS in ACS

ROC curve showed that the presence of 52 risk factors (Diabetes, EDV >200 cm/sec, or lack of clopidogrel) was predictive of INS
- sensitivity 89%, specificity 78%
- positive predictive value 33.3%
- negative predictive value 98.2%

Kaplan-Meier Survival Free of INS in ACS

Impact of 2 or more risk factors on INS

Impact of OMT on INS
Every effort should be made to ensure that all patients with Asymptomatic Carotid Stenosis received Optimal Medical Therapy irrespective of the decision to revascularize or not.

We identified these risk factors for predicting stroke in ACS patients: diabetes mellitus, EDV >200 cm/sec, and no Clopidogrel used in OMT.

Summary

Repair of Asymptomatic Carotid Stenosis is never mandatory. However, CEA is often justified if:

1. It can be done safely with combined perioperative stroke/death rate < 2-3%
2. The patient life expectancy is > 3 years
3. The patient is identified to be at higher risk of stroke because of the presence of clinical variables or higher grade stenosis.