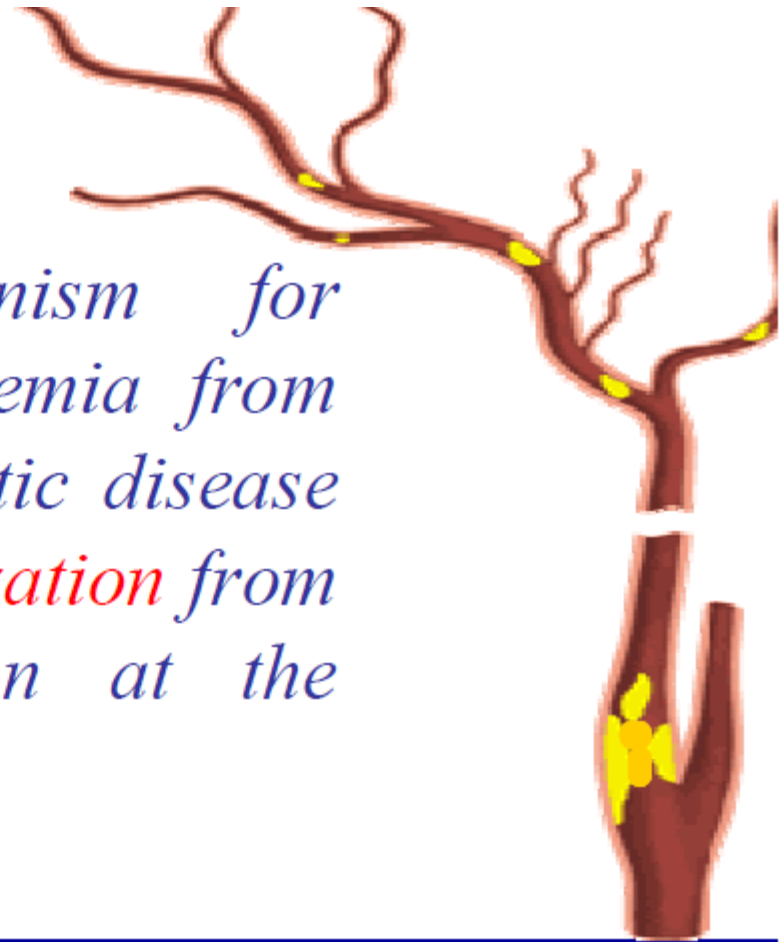


# CLINICAL DECISION MAKING IN CAROTID STENTING



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*The most common pathogenic mechanism for acute cerebral ischemia from carotid atherosclerotic disease is **the plaque embolization** from a **vulnerable** lesion at the carotid bifurcation.*



# Stroke Due to Extracranial Carotid Artery Disease

## *Who's at risk?*

- Severe stenosis
  - With symptoms, >50%
  - Without symptoms, >80%
    - Rapid progression of stenosis may add further risk
- Hemispheric symptoms due to carotid disease
  - TIA or non-disabling CVA
  - Most predictive of future stroke
  - Amaurosis fugax generally has a more benign course than hemispheric symptoms

## Definition:

A carotid stenosis is defined as 'symptomatic' when it is correlated with at least 1 clinical episode of ipsilateral ocular or cerebral ischemia in the previous 6 months.

ECST



$$\% \text{ Stenosis} = \frac{c-a}{c} \times 100$$

NASCET



$$\% \text{ Stenosis} = \frac{b-a}{b} \times 100$$

Pts **at av. or low surgical risk** WITH nondisabling ischemic stroke or transient cerebral ischemic symptoms within 6 months (**symptomatic**) should undergo CEA or CAS as an alternative if the diameter of the lumen of the ipsilateral ICA is reduced **> 70% as documented by noninvasive imaging or > 50% as documented by catheter angiography** and the anticipated rate of perioperative stroke or mortality is less than 6%

Selection of asymptomatic pts for carotid revascularization should be guided by assessment of comorbid conditions, life expectancy, and other individual factors and should include a thorough discussion of the risks and benefits of the procedure with an understanding of patient preferences

It is reasonable to perform CEA or CAS in **asymptomatic patients** who **have > 70% stenosis** of the ICA if the risk of perioperative stroke, myocardial infarction, and death is low.



It is reasonable to choose **CAS** over CEA when revascularization is indicated in patients with neck anatomy unfavorable for arterial surgery

- arterial stenosis distal to the C2 vertebra
- proximal (intrathoracic) arterial stenosis
- previous ipsilateral CEA
- contralateral vocal cord paralysis
- open tracheostomy
- radical surgery
- irradiation

When revascularization is indicated for patients with TIA or stroke and there are no contraindications to early revascularization, intervention within 2 weeks of the index event is reasonable

In symptomatic or asymptomatic high risk patients the effectiveness of revascularization versus medical therapy alone is not well established

- age >80 years
- New York Heart Association class III or IV heart failure
- left ventricular ejection fraction <30%
- Class 3 or 4 angina
- Severe left main or multivessel disease
- Need for cardiac surgery within 30 days
- MI within 4 wks
- Severe chronic lung disease

# CAS is not recommended

- < 50% narrowing
- chronic total occlusion of the targeted carotid artery.
- severe disability caused by cerebral infarction that precludes preservation of useful function.

# Carotid Artery Evaluation and Revascularization Before Cardiac Surgery

CEA or CAS with embolic protection before or concurrent with myocardial revascularization surgery is reasonable in pts with  $> 80\%$  carotid stenosis who have experienced ipsilateral retinal or hemispheric cerebral ischemic symptoms within 6 months

In patients with asymptomatic carotid stenosis, even if severe, the safety and efficacy of carotid revascularization before or concurrent with myocardial revascularization are not well established

The two most important features of carotid bifurcation atheroma are the **degree of diameter stenosis** and the **character of the bifurcation plaque**

NASCET and ECST, a higher degree of stenosis in symptomatic patients was associated with a higher stroke risk.

**Heterogeneous plaques** have been shown to increase the risk of neurologic symptoms (TIA/stroke) than that in homogenous plaques for all grades of stenosis

- **Carotid Adverse Anatomy**
  - **Type III arch**
  - **Severe Tortuosity**
  - **Sharp Entry angle at lesion**
  - **Sharp Exit angle at lesion**
  - **Absent Clear path across lesion**
  - **Heavy Calcification**
  - **Poor landing Zone**



# Lessons Learned/Avoid These S

- **STEEP Arch (Type III)**
- **SEVERE tortuosity**
- **SHARP Entry Angle**
- **SHARP Exit Angle**
- **INSUFFICIENT Landing Zone**
- **UNSATISFACTORY Collaterals**



# CAS exclusion: **SELECTION OF PATIENTS**

- High risk **PATIENTS** for CAS
  - Know your patient personally!!!

>80 y of age

Access problems

Recent stroke

Antiplatelet intolerance

Marked cerebral atrophy / dementia

# CAS exclusion: **SELECTION OF LESIONS**

- High risk **LESIONS** for CAS
  - Know your patient personally!!!

Thrombus / obvious filling defect

Extreme calcification

Severe distal loops/kinks/bends

String lesions (asymptomatic)

(Vulnerable plaque)

## CAS Outcomes Tied To . . .

### **ANATOMY**

- ❖ Difficult Arch
- ❖ CCA/ICA  
Tortuosity
- ❖ Lesion anatomy

### **PATIENT**

- ❖ Symptoms
- ❖ Octogenarians
- ❖ Cerebral Reserve

### **OPERATOR**

- ❖ Early learning curve
- ❖ Case selection
- ❖ Stubborn persistence

### **DEVICE SELECTION TECHNIQUE**

- ❖ Embolic Protection
- ❖ Stent design
- ❖ Cerebral protection



**THANK YOU**