Management of Asymptomatic Carotid Artery Stenosis

Matthew Blair, D.O.
Hospitalist - MetroHealth hospital
Objectives: For the Primary care physician to be able to:

- Discuss and institute appropriate medical treatment for asymptomatic carotid artery stenosis
- Educate their patients on the risks and benefits of medical and surgical treatment
- Relay to patients the possible surgical options for treatment
- Be informed of new research being done to determine whether medical or surgical options are best
Patient Presentation

- 78 year old female
- 15 year Hx of HTN and 25 pack-year smoker
- US confirmed 80-99% Right ICA stenosis (investigated after a bruit was heard on PE)
- Excellent functional status - walks 3 times / week
- Meds: Lisinopril, HCTZ, atorvastatin and Vit D
- Other that the right bruit, PE is unremarkable
Patient then asks:

- What is my risk of stroke?
- What is the best way to treat it?
- How risky are the procedures to treat the artery narrowing?
Considerations

- Common problem: 7-9% of patients by age 75
- Stroke risk
- Access to surgical therapy
- Risks of revascularization
- Medical therapy
Risk of Stroke

- ICA stenosis is associated with 10-15% of ischemic strokes in the United States
- Patients are concerned with the potential devastating outcome of a stroke
- According to Framingham data, stroke patients have a reduced life expectancy of 12 years (but patients are more worried about the disability)
Risk of Major stroke is decreasing

• 1980s: Risk of stroke with 80-99% stenosis was approximately 3% per year
  • 90-99% stenosis was 5% per year

• Significant improvement in the last 30 years
  • Asymptomatic Stenosis of > 50% carries a 0.5 to 1% risk per year
    • 2.83% before 2000, 1.13% after 2000¹

• Why?

A lot has happened in the past 30 years

- Prevalence of ischemic heart disease improved by $>30\%$
- Rate of smoking decreased by 14%
- Incidence of atrial fibrillation decreased 6%
- Rate of PAD decreased 6%
- All of these trends are associated with a lower risk of stroke
- But why??
Medical Therapy

The marked increase in the prescription of effective therapies for *cardiovascular risk reduction* has occurred simultaneously with a significant improvement in the natural history in carotid atherosclerosis.
Medical Therapy

- **Hypertension control** - the association of BP reduction with a lower incidence of stroke is clear

- There is data to support the use of diuretics, CCB, BB, ACE-I and ARBs

- **Heart Outcomes Prevention Evaluation (HOPE) trial**: Ramipril 10mg vs placebo reduced the incidence of death, MI, stroke and death from cerebrovascular causes by 22%
  - Patients with cerebrovascular disease had a 30% reduction in the rate of stroke during 4.5 years of follow up

- **Losartan Intervention for Endpoint Reduction in HTN Study**
  - Reduced rate of fatal and nonfatal stroke by 25% compared with atenolol
Medical therapy

- **Statins** - largely responsible for the decrease in stroke incidence in the past decade

- Heart Protection Study (HPS): 20,536 with CAD, diabetes or other arterial occlusive disease randomized to simvastatin 40 mg/day or placebo
  - Simvastatin associated with a 25% reduction in stroke
  - Also reduced the need for carotid revascularization by 50%

- Collaborative Atorvastatin Diabetes trial: 10mg of atorvastatin reduced stroke by 48% vs placebo in patients with diabetes and an additional cardiovascular risk factor
Medical therapy

- **Aspirin** - little data exists demonstrating benefit in primary prevention
  - Women’s Health Study: ASA did not reduce the primary endpoint of nonfatal MI, nonfatal stroke or death from CV causes
  - Asymptomatic Cervical Bruit study: No difference in stroke rates between ASA 325 mg and placebo in patients with asymptomatic carotid artery stenosis
Revascularization

- 3 major studies: ACAS, ACST and CREST
- ACAS: Asymptomatic Carotid Atherosclerosis Study
  - 1987-1993
  - CEA vs medical therapy
- ACST: Asymptomatic Carotid Surgery trial
  - 1993-1998
  - Immediate vs deferred CEA
- CREST: Carotid Revascularization Endarterectomy vs Stenting Trial
  - Published 2010
  - Stenting vs CEA
Revascularization

- **ACAS: 1987-1993**
  - 1662 patients with asymptomatic ICA of 60% or more randomly allocated to CEA or medical therapy.
  - All received ASA
  - CEA showed an estimated reduction over 5 years in ipsilateral stroke, or any perioperative stroke or death of 11% vs 5.1%
  - However, the difference for the combined outcome of ANY major stroke or death was NOT significant
    - 25.5% for medical therapy vs 20.7% for CEA
Revascularization

- **ACST: 1993-1998**
  - Consistent with ACAS findings
  - 3120 patients with 60% of more unilateral or bilateral stenosis
  - Randomly allocated to immediate vs deferred CEA
  - Estimated reduction of the probability of any stroke or perioperative death over 5 years from 11.8% with immediate CEA compared with 6.4% for deferred
  - Plus, immediate CEA as associated with a significant reduction in contralateral stroke
  - **BUT** - for Overall rate of stroke or death was not significant; immediate 25.5% vs deferred 25.3%
Revascularization

Key Point: Before major improvements in medical therapy, the benefits of revascularization were MODEST despite the Class IIa recommendation that it is “reasonable” to perform the procedure in asymptomatic patients with stenosis of > 70%.
Revascularization

- CREST: Carotid Revascularization Endarterectomy vs Stenting Trial
  - Published 2010
  - First large, randomized trial of patients at standard risk to evaluate stenting (CAS) vs endarterectomy (CEA)
  - 2502 patients with symptomatic and asymptomatic stenosis
  - Primary combined endpoint was death, any stroke and MI during periprocedural period and ipsilateral stroke within 4 years of follow up
  - In the asymptomatic arm, the CAS and CEA groups had the same number of periprocedural endpoints - 21 each.
  - Also, no difference in the rate of restenosis between the 2 groups during the 2 year follow up.
Revascularization

CREST-2: Carotid Revascularization Endarterectomy vs Stenting Trial 2

- Will compare optimal medical therapy (OMT) alone vs each type of revascularization (CAS and CEA) and medical therapy
- Ongoing now
Current State of Atherosclerosis

2 factors should be considered regarding revascularization of asymptomatic ICA disease
1. The primary cause of death is these patients is CARDIAC in origin, not stroke related
2. The presence of asymptomatic ICA stenosis indicates an increased risk of CAD events

The presence of a carotid bruit increases the risk of MI by more than 3-fold to 5% per year\(^2\)

Summary

- The 2 major trials evaluating CEA, show small reductions in stroke compared with best medical therapy that is now out of date

- CREST, showed no difference between CEA and CAS in patients without symptoms

- A new trial, CREST-2 is being done to answer the following question - Does best carotid revascularization combined with optimal medical therapy reduce death, stroke and MI more than optimal medical therapy alone?

- ACST-2 - designed to compare CAS and CEA in patients without symptoms is enrolling patients
Our patient, Mrs H

- Understood the implications of her diagnosis of symptomatic ICA
- Recognized the low rates of adverse events with any of the potential therapies
- Elected for stenting as part of a registry study
- Received dual antiplatelet therapy for one month
- Doing well 1 year after implantation