



The *Heart* of the Matter

Cardiology Associates, P.C.

Monday, November 15

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A Message from Cardiology Associates, P.C.



Dear Colleagues,

Our November, 2010 Referring Physician newsletter focuses on the diagnosis and treatment of coronary artery disease (CAD). This condition is the most common type of heart disease. CAD is the leading cause of death in the United States for both men and women. Dr. Robert Lager discusses the outcomes of recent medical research studies aimed at identifying proper treatment options for CAD patients.

About the Author

Dr. Robert A. Lager sees patients in our Washington DC, K street location. He is board-certified in internal medicine with cardiology and interventional cardiology sub-specialties. Dr. Lager has a special interest in consultative cardiology, interventional cardiology, and peripheral vascular disease. He is a fellow of the American College of Cardiology and a member of the American College of Physicians and the Alpha Omega Alpha Honor Society.

Tailoring Treatment Options for Your CAD Patient



Presentation of Case

Mr. J is an 82-year-old man with a history of HTN, renal insufficiency, and type 2 diabetes mellitus who was noted by his primary care physician to have a right-sided carotid bruit. A carotid duplex showed elevated velocities in the right internal carotid and B-mode ultrasound was also suggestive of a 70-79% stenosis of the proximal RICA. On detailed questioning the patient denied any history of focal weakness, sensory disturbance, aphasia or loss of vision.

Mrs. Q is a 63-year-old female with a greater than 100 pack-per-year history of tobacco use, HTN, and COPD. She presented to an urgent care clinic with complaints of right-sided weakness and an expressive aphasia for two hours which gradually resolved spontaneously. On follow up in a neurologist's office, an MRA demonstrated a 70-79% left internal carotid artery stenosis.

Mr. P is a 72-year-old male with a long history of CAD, S/P CABG spanning ten years. He also has a long history of PAD, and has had S/P right femoral popliteal bypass surgery and left carotid endarterectomy six years ago. On routine surveillance ultrasound, he was found to have a 70-79% recurrent stenosis of the left CEA site.

Discussion

Stroke is currently the third leading killer in the US, behind CAD and cancer. Carotid disease accounts for approximately 10% of all ischemic strokes. The treatment for carotid artery disease is currently in a state of flux with a great deal of controversy regarding the appropriate interventions required.

Currently, the clinical approach to the patient with carotid disease is heavily influenced by:

- (1) the symptomatic state of the patient and
- (2) the risk of intervening.

Our first patient **Mr. J** is truly asymptomatic without history of neurologic events. The seminal studies of medical therapy versus carotid endarterectomy surgery (CEA) in asymptomatic patients 1,2 show a surprisingly low annual risk of stroke of only 2% per year. This is cumulative and by year 5 the risk is approximately 11%. Moreover, CEA and carotid stenting (CAS) have upfront procedural risks of stroke and death of between 2-4%. This explains our current recommendations of only re-vascularizing asymptomatic patients who have a good expected prognosis over a period of five years, as it takes at least the first two years for the benefits of re-vascularization to "catch up" to the medical arm. At five years the risk was reduced by half through re-vascularization. Of note, this study does not take into account the recent improvements in medical therapy that have occurred since the large trials of asymptomatic patients were performed.

Age is also a strong risk for intervention, and patients over the age of 75 have been shown to be at higher risk for all complications. Thus **Mr. J** was treated medically with a statin, ASA and anti-hypertensive medication. He continues to feel well and plans surveillance ultrasound annually to follow up on marked changes.

Mrs. Q was presented with acute neurologic symptoms and was therefore symptomatic. The risk of recurrent events with medical therapy alone in symptomatic patients (as shown by large-scale trials 3,4) appears to be greater than 25% in just the first year. Almost any stenosis greater than 60% with associated symptoms generally should be re-vascularized.

Much controversy currently surrounds the choice of re-vascularization. Several European studies recently have suggested that carotid endarterectomy is superior to carotid stenting in the symptomatic patient. Critics, however, argue that the studies were fatally flawed by allowing low volume operators to perform stenting without the mandated protection of cerebral circulation with either distal protection with filters or proximal protection with occlusive techniques. The CREST trial was published this year, representing the largest US study to date of 2,502 patients randomized between CEA and CAS. Over 53% of the patients were symptomatic and there was no difference in outcomes for these symptomatic patients treated with either modality. In fact, the primary endpoint of the study (freedom from death stroke and MI at four years) was not statistically different for CAS or CEA in both symptomatic and asymptomatic patients. The risk of stroke however, was higher when using stenting and the risk of MI was higher when using CEA (**Figure 1**).

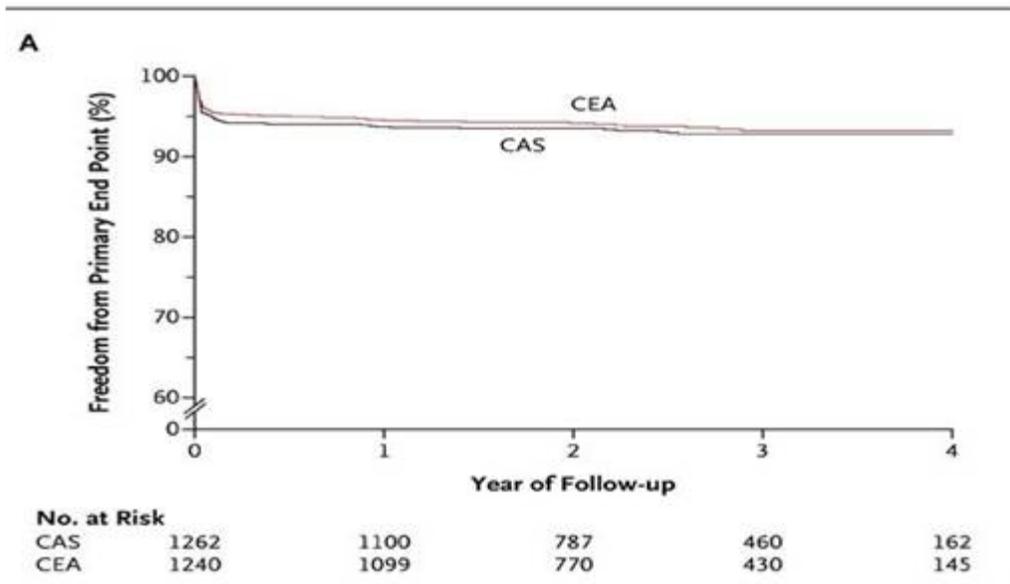


Figure 1: Results of CREST trial showing equivalence of CEA and CAS for primary composite outcome of freedom from death, stroke, and MI at 4 years.

Mrs. J was not considered high risk to undergo CEA due to other morbidities, as her lung disease was not severe. Currently in the US, the Centers for Medicare and Medicaid will only reimburse the cost of an endarterectomy for low-risk patients, despite the overwhelming amount of research supporting the safety and efficacy of carotid stenting in this group. These high-risk patients can thus only undergo stenting via research protocols. Mrs. J had an in-depth discussion with her physician regarding these issues and opted for carotid endarterectomy. Although she had mild cranial nerve palsy post-operation (a potentially severe complication of CEA in 5% of cases), she had no further ischemic events.

Conversely, **Mr. P** is at high risk for carotid endarterectomy due to the history of previous carotid surgery. This "hostile neck syndrome" which includes prior surgery, neck irradiation, and other radical neck surgeries can make carotid surgery impossible. Other factors that increase the risk of carotid surgery are highlighted below (Table 1).

HIGH RISK FACTORS FOR CAROTID SURGERY

Clinical Factors	Anatomic Factors
Age > 80	Previous CEA
Severe congestive heart failure	High cervical lesion
Depressed LV function (EF < 30%)	Contralateral occlusion
Need for CABG	Radiation therapy to neck
Recent MI/Unstable angina	Prior radical neck surgery
Severe pulmonary disease	Severe tandem lesions
Contralateral laryngeal nerve palsy	Neck contracture

Table 1: High Risk factors for carotid endarterectomy surgery

Age as a risk factor requires specific attention. Most contemporary studies support the concept of carotid stenting having a lower risk in younger patients than the older population. Although not necessarily intuitive, given the less invasive nature of CAS, this is likely due to the increased risk of endovascular manipulation with age-related calcification and tortuosity of the carotid system. CREST demonstrated a trend toward better outcomes for CAS in younger patients (<70 yrs) and showed improved outcomes for CEA in older patients (**Figure 2**).

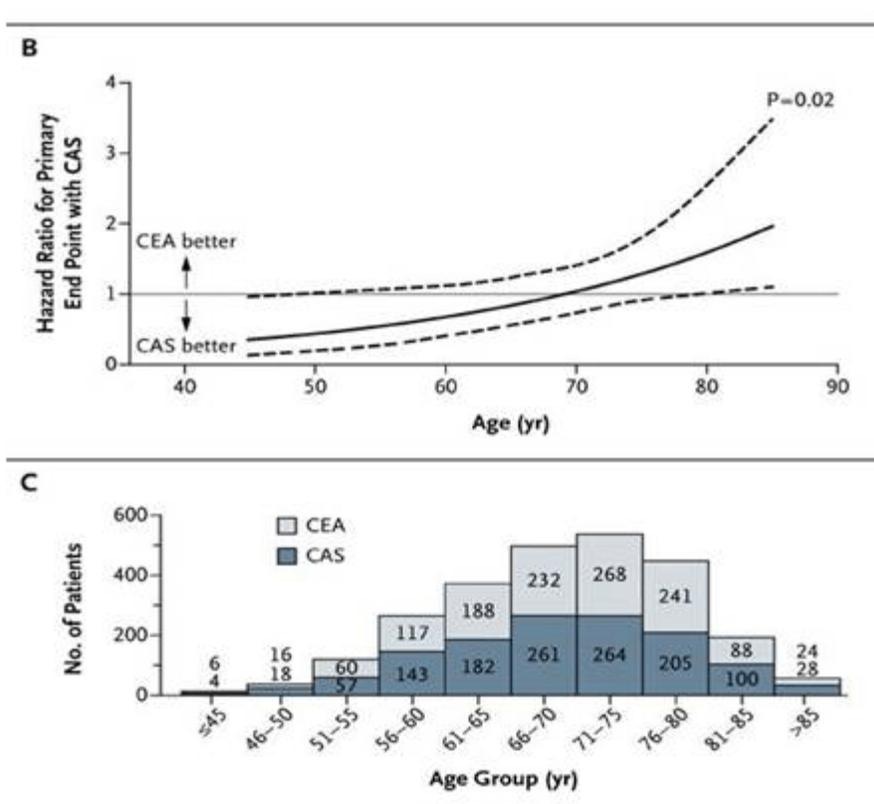


Figure 2: Results from the CREST trial showing the effect of age on outcomes with CAS and CEA

Mr. P thus underwent carotid stenting using a distal protection filter (Figures 3 and 4) and had an unremarkable recovery.

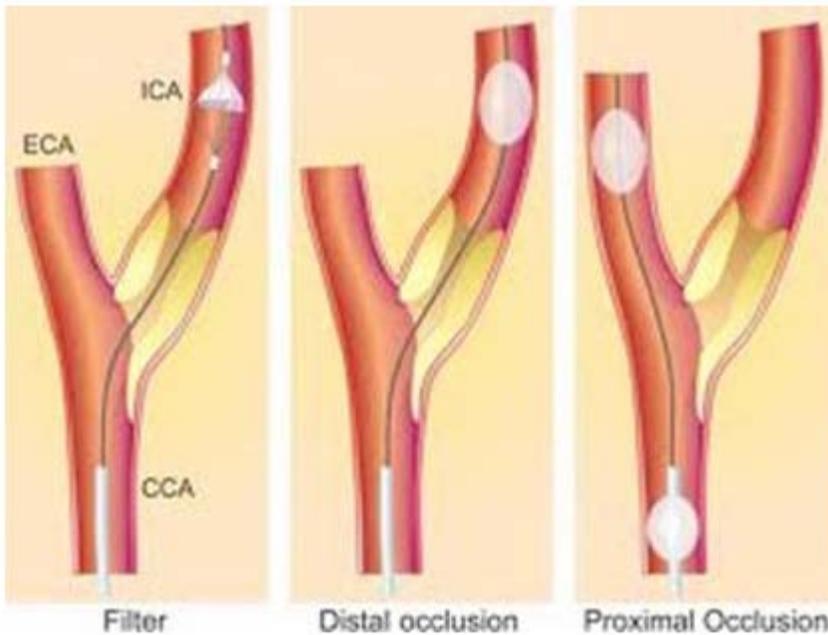


Figure 3: Various techniques used in protecting the cerebral circulation during carotid stenting

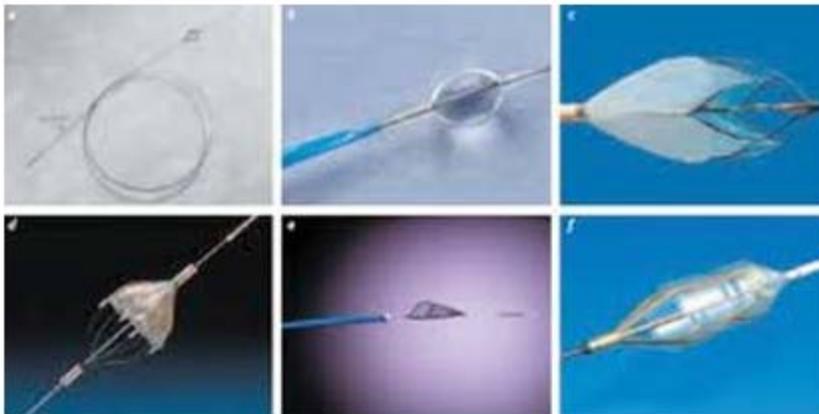


Figure 4: Devices used in carotid stenting - distal filters, distal occlusion balloons and proximal occlusion balloons

The three case studies above show that, despite similar stenosis severities of the extracranial carotid system, the paramount importance of tailoring therapy for each patient is to maximize benefit and minimize risk. Although much controversy about proper treatment methods still remains, a careful evaluation of the subject's clinical history and carotid anatomy will provide the clinician with the knowledge needed to make a wise decision for their patient.

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