

Unstable symptomatic carotid plaques are associated with an increased incidence of new ipsilateral silent embolic events after CAS compared with CEA.¹⁸⁻²⁰ In the absence of data showing comparable risks of stroke and silent emboli for CAS, angioplasty and stenting should only be offered to symptomatic patients when mitigating factors suggest an unacceptable risk with CEA.

It is likely that CAS will continue to improve with (1) better patient selection, (2) better embolic protection devices, (3) better stents (membrane or mesh covered), (4) technical improvements (eg, avoiding aortic arch manipulations), and (5) additional operator experience.¹⁹ Adoption of all these may well improve CAS outcomes and make it a fair alternative to CEA, at least in certain patient subgroups. However, the current evidence indicates that we are not there yet, and it seems unfair to spin either CREST² or the AHA/ASA guidelines¹ to conclude that we are.

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SVS INVITED RESPONSE

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Is carotid artery stenting (CAS) a fair alternative to carotid endarterectomy (CEA) for symptomatic carotid stenosis? In the accompanying communication, Drs Paraskevas, Veith, Riles, and

Moore review the available evidence and conclude the answer is "no" regardless of the context of the recently published American Heart Association/American Stroke Association (AHA/ASA)

guidelines in which CAS is described as an “alternative” in symptomatic patients.¹ Since the Society for Vascular Surgery (SVS) is one of a consortium of medical professional organizations who have endorsed these guidelines, it is appropriate for our society to comment. As a professional society, the SVS has responded to the question posed in this article in a variety of formats and communications over a number of years in a manner similar to Paraskevas et al, with a firm “no.” How is it, then, that the SVS would co-sponsor the AHA/ASA guidelines? Indeed, how could it be that two of the communication authors provide de-facto endorsement of the guidelines by serving as co-authors? The AHA/ASA document is a high quality article that addresses the entire spectrum of extracranial cerebrovascular issues very well. CAS for symptomatic carotid disease is an alternative for CEA only in rare clinical situations, given the current state of CAS technology and the available clinical evidence documenting CEA as having significantly lower stroke/death rates when compared to CAS.²

The SVS clinical practice guidelines referable to carotid disease, originally published in 2008 and currently undergoing update, indicate that CEA plus optimal medical therapy is the preferred treatment for most patients with symptomatic carotid stenosis. Using the identical “GRADE” system applied in the AHA/ASA guidelines, the SVS reported CEA as a class I recommendation supported by high-quality evidence.³ The SVS guidelines further state (weak recommendation plus low quality evidence) that “carotid stenting is a potential alternative treatment to CEA in symptomatic patients with >50% stenosis and high perioperative risk.”³ A careful reading of the AHA/ASA guidelines, in fact, reveals that its recommendations for revascularization are entirely consistent with the 2008 SVS clinical practice guidelines, despite the addition of CREST and other recent randomized trials as summarized in Table 1 of the communication by Paraskevas et al. The AHA/ASA guidelines indicate (Class I recommendation) that CEA is the treatment for symptomatic carotid stenosis, and that “CAS is indicated as an alternative to CEA for symptomatic patients at average or low risk of complications associated with endovascular intervention . . .” The recommended threshold for acceptable stroke/death complications was quoted at 6% for both procedures, a figure that was originally promulgated by consensus for CEA (only), published in 1995 as part of an AHA consensus guideline and not updated in a scientific manner since then, to our knowledge.⁴ We now know, in fact, that this 6% threshold rather accurately states the stroke/death risk of CAS in symptomatic patients (in the hands of experts); multiple current studies indicate that the corresponding figure for CEA is in the 3% range.^{2,5} The long awaited CREST data indicate periprocedural stroke/death risk for CAS in symptomatic patients is essentially two-fold that for CEA.² Indeed, the composite end point (ie, stroke/death/MI) of CREST notwithstanding, the editorial accompanying the initial publication of CREST succinctly stated a perspective on all the available randomized, controlled trials, with the observation “. . . the results (of CREST) are broadly consistent with those in previous trials. Namely CAS is associated with a higher periprocedural risk of stroke or death (compared to CEA), a difference that was still significant at 4 years.”⁶ Clearly, this difference is most dramatic in symptomatic patients. The European randomized trials of CAS vs CEA have been criticized frequently for poor training and modest experience of the CAS operators with the implication that CAS results would have been better had more skilled interventionalists been at the controls. Preferring to interpret the European evidence without bias toward interventionalist skill, Rothwell called for a moratorium on CAS in symptomatic patients.⁷ Strict performance criteria were employed from the outset for CAS operators in CREST, with results demonstrating a 30-day stroke/death rate of $6.0 \pm 0.9\%$ for CAS, while the analogous value was 7.4% in the European ICSS; the difference in these complication rates is not significantly different between the two trials.^{2,5,8}

The SVS has stated its position, doubtlessly consistent with the vast majority of not only vascular surgeons, but all clinicians who aspire to practice evidence-based medicine, that CEA is the treat-

ment of choice for symptomatic carotid stenosis for the vast majority of patients. Is then, the SVS endorsement of the recently published AHA/ASA guidelines referable to extracranial cerebrovascular disease somehow in conflict with that position? We think not, and it is appropriate to review the history of this document, the prominent role the SVS designated members of the writing committee imparted (including two authors of the accompanying communication), and the final considerations of both the SVS Document Oversight and Executive committees in ultimately agreeing to endorse the guidelines. The document itself (all 78 printed pages of text and 750 references) is an admirable compendium of information on all issues referable to extracranial cerebrovascular disease, and the consortium of professional societies as endorsing signatories is indeed impressive. This is not to say that the SVS was swayed by a “go with the majority” mentality. In the formation of this writing group, perhaps as a function of the AHA guidelines process, vascular surgery was initially afforded but one position on the writing committee, and the SVS declined the invitation to participate. Extensive negotiations between the SVS and the AHA/ACCF guidelines group ultimately produced a more appropriate representation of vascular surgeon authors on the writing group, and thereafter the SVS agreed to participate. Such consensus guidelines involve debate and compromise, and our vascular surgeon representatives were often in a position of “holding the line” against enthusiasm for CAS from some quarters, regardless of the evidence supporting CEA in symptomatic patients. Careful review of the AHA/ASA guidelines by the SVS Document Oversight Committee indeed cited use of the term “alternative” in characterization of CAS. The SVS Executive Committee carefully reviewed the guidelines and in conference with the guidelines principle authors (Drs Thomas G. Brott and Jonathan L. Halperin), clarified that the revascularization recommendation section does, indeed, indicate that CEA is the preferred treatment for symptomatic carotid stenosis. The consideration of CAS as an “alternative” therapy was not intended to imply “equivalence” according to these authors. Debate about alternative language to the term “alternative” was considered counterproductive as AHA process would have mandated return of the document to all 16 sponsoring societies and all authors to alter a single word. It is worth emphasizing that the AHA/ASA guidelines indicate CEA is the treatment of choice in appropriately selected asymptomatic patients (Class II A recommendation, evidence level A) and that CAS “might be considered in highly selected patients with asymptomatic stenosis . . . but its effectiveness compared to medical therapy alone is not well established” (Class II B recommendation, evidence level B). Again, such recommendations are entirely consistent with the 2008 SVS Clinical Practice Guidelines.

The SVS, in its prior position statements and guidelines and again in this forum, unequivocally states that CEA is the treatment of choice for patients with symptomatic carotid stenosis who are at acceptable risk for surgery. The SVS endorsed the AHA/ASA guidelines document after careful consideration, in deference and with thanks to its vascular surgeon co-authors, Drs Ruth L. Bush, Wesley S. Moore and Thomas S. Riles. It is anticipated that “alternative” will be considered “equivalent” in some quarters, regardless of the preponderance of evidence in support of CEA for patients with symptomatic carotid stenosis. Perhaps this reflects human nature or the imperfect nature of consensus documents. The soon-to-be-published SVS updated and revised Clinical Practice Guidelines referable to carotid disease will offer a focused perspective for clinicians incorporating all current data. In summary, we agree with the authors of the accompanying communication that (1) CAS outcomes are likely to improve over time, and (2) that current evidence indicates stroke and death rates are significantly lower for CEA vs CAS in symptomatic patients.

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