Editorial

Coronary artery disease and carotid endarterectomy

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The article by Shimada, et al., on the prevalence of coronary artery disease (CAD) and carotid atherostenosis in patients selected for carotid endarterectomy (CEA) is timely and pertinent. The concomitant occurrence of atherostenosis in several vascular beds is a characteristic feature of this systemic disease, which has been well described in the past. The coexistence of CAD and cerebrovascular symptoms and/or neck bruits is also highly prevalent. In a large single-center series several decades ago, Hertzer and Lees reported that 60% of the early postoperative deaths following CEA were due to myocardial infarction, which occurred in 1.8% of the entire study population. In a more recent retrospective chart review of 12 US academic centers, McCrory and associates found a 3.4% incidence of nonfatal myocardial infarction among 1160 patients who had undergone CEA. Even though many of the recent CEA trials have excluded patients with recent myocardial infarction and unstable angina, the incidence of perioperative myocardial infarction has still been found to be between 0.9 and 2%, indicating the relevance of the problem.

In the paper by Shimada and colleagues, the authors identified predictors of CAD in patients with high-grade carotid artery stenosis, based on established cardiovascular risk factors and a history of CAD. All the patients in their study underwent either exercise stress testing or myocardial scintigraphy, and their efforts paid off by showing no myocardial infarction (zero of 200 cases) in the month after CEA. Their main finding was an elegantly shown stepwise increase in the risk of CAD as the classic coronary risk factors increase. The authors’ approach also underscores the importance of not depending only on patient history or symptoms for diagnostic purposes. Among the series of 200 patients, 18 had occult CAD and diabetes mellitus was an independent risk factor associated with this group.

The main question derived from the study is what to do with patients who need carotid revascularization for stroke prevention but also have concomitant significant CAD. Unfortunately, this question remains unanswered. The authors performed percutaneous coronary interventions (PCIs) in 31 of the patients found to have CAD, always before CEA; coronary artery bypass graft (CABG) surgery in 24 patients, “principally performed within a couple months after CEA”; both PCI and CABG in three patients; and medical therapy only in 15 patients. They do not tell us what the criteria were for choosing one form of treatment over another, but these were likely to have been based on the severity of the CAD. Particularly difficult is choosing which procedure to perform first in patients with both carotid and coronary disease, the carotid or the coronary revascularization? What is the appropriate time interval between procedures? The possibility of performing carotid angioplasty and stent placement as another effective revascularizing procedure introduces new elements into this equation. Patients with unstable, active, or severe CAD and concomitant high-grade carotid artery stenosis have been identified as candidates for carotid angioplasty and stent placement. This strategy remains to be proven in larger prospective studies, however. A recent review of medical records from 429 patients, 84 (17%) of whom were considered to have high perioperative risk, showed no significant difference in outcomes between the high- and low-risk groups, indicating that in proficient hands CEA is equally safe for all risk groups.

It is well established that the preoperative administration of beta blockers prevents myocardial infarction after major noncardiac surgery in patients with CAD; however, data from a recent study reveals that this practice is still underutilized in the US.

We believe that in high-risk patients, the perioperative risk of CEA may be decreased by carotid angioplasty and stent placement, but complications from this combined procedure are highly operator-dependent and their frequency is extremely variable among centers; data regarding this issue are incomplete at this time. We strongly recommend monitoring complications and outcomes of both procedures—CEA and combined carotid angioplasty and stent placement—at each center as a way of making informed treatment decisions.

Consider also that the risk of stroke related to CABG may be more connected to the presence of aortic arch atherosclerotic plaques, presumably dissected during aortic cannulation in CABG, than to coexisting carotid artery stenosis. Preselecting the aortic cannulation site with the use of intraoperative transesophageal echocardiography can be helpful in avoiding perioperative strokes in CABG; however, this practice has yet to be routinely established.

At this point in time and based on our own experience and that of others in the literature, we treat patients according to the following guidelines. 1) Patients with symptomatic, unstable, or severe CAD amenable to PCI and concomitant asymptomatic high-grade carotid artery stenosis.
undergo PCI first and CEA several weeks later if cardiac symptoms have resolved. 2) Patients with symptomatic, unstable, or severe CAD not amenable to PCI but amenable to CABG concomitantly with asymptomatic high-grade carotid artery stenosis undergo combined carotid angioplasty and stent placement first, followed by CAGB as soon as possible. 3) Patients with symptomatic, unstable, or severe CAD not amenable to either PCI or CAGB and concomitant asymptomatic high-grade carotid artery stenosis receive maximal medical therapy for CAGB and undergo carotid angioplasty and stent placement. 4) Patients with symptomatic high-grade carotid artery stenosis and symptomatic, unstable, or severe CAD amenable to PCI first undergo PCI, followed by CAGB or combined carotid angioplasty and stent placement depending on the results of coronary revascularization. 5) Patients with symptomatic high-grade carotid artery stenosis and symptomatic, unstable, or severe CAD not amenable to PCI but amenable to CAGB first undergo carotid angioplasty and stent placement and then CAGB. 6) Every patient is pretreated (unless there are formal contraindications) with beta blockers, angiotensin receptor inhibitors, and statins; antithrombotic agents are added to the preprocedure regimen when indicated.

These are not recommendations based on robust scientific data; rather, they are expressions of our current personal bias.

In summary, Shimada, et al., should be congratulated for bringing to our attention the fact that with relatively simple tools and a good history, we can avoid dreadful outcomes in patients undergoing CEA.

References


RESPONSE: We appreciate the thoughtful analysis of our article by Drs. Forteza and Heros. We have a therapeutic strategy for CADs together with all the other systemic vascular diseases to achieve maximum success in our patients. The kind words by Drs. Forteza and Heros have encouraged us greatly. As they recommend, our next step is to determine how we should treat patients with multiple vascular diseases; that is, should we treat first the carotid artery stenosis or CAD? We essentially agree with the guidelines proposed by Drs. Forteza and Heros. As we described in the Results of our article, however, we often perform CEA first and CAGB surgery within a few months thereafter in patients with symptomatic high-grade carotid artery stenosis and symptomatic, unstable, or severe CAD not amenable to PCI but amenable to CAGB, although the performance of carotid angioplasty and stent placement instead of CEA in such patients is another frequent choice. The best medical therapy performed by our team, including special cardiologists, might prevent perioperative coronary accidents after CEA. Investigators from the Stenting and Angioplasty with Protection in Patients at High Risk for Endarterectomy trial proved the worth of carotid angioplasty and stent placement with the use of an embolic protection device compared with CEA in patients with severe carotid artery stenosis and coexisting conditions such as clinically significant cardiac disease. Regarding the management of severe CAD, the recent prevalence of drug-eluting stent implantation, which prevents neointimal hyperplasia and restenosis following PCI, may replace CABI0 including, to some extent, its minimally invasive direct form. Soon we must redesign our therapeutic protocols for multiple vascular diseases based on data from ongoing clinical trials comparing the established with the new therapeutic techniques for carotid, coronary, and other systemic arterial diseases.

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References