

EDITORIAL COMMENT

A New Approach for Combined Carotid and Coronary Disease

The SHARP Study*

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A hybrid strategy combines the treatments traditionally available only in the catheterization laboratory (cath lab) with those traditionally available only in the operating room (OR), to offer patients the best available combination of treatments for any given set of cardiovascular lesions.

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Cardiac surgeons and interventional cardiologists have been performing hybrid procedures since the first percutaneous intervention was followed later (perhaps several days or months later) by a traditional cardiac surgical procedure. In the modern era, a hybrid procedure refers to the combination of traditional surgery and percutaneous intervention—staged by minutes, hours, or at most, days—typically during the same hospital stay. This more compressed staging of hybrid procedures is the subject of the report by Versaci et al. (1).

Definitions

Because the sequence and timing of each procedure is becoming more important, it might be helpful to define the staging, on the basis of how much time and space separates the 2 procedures. The 2 procedures can be separated by 2 different hospital stays in a planned treatment strategy (“2-hospitalization hybrid”), they can be separated by 2 different days during the same hospital stay (“1-hospitalization hybrid”), they can be separated by 2 different procedural suites during the same day (“same day hybrid”), or they can be separated by minutes when the 2 procedures are performed in a combined hybrid cath lab/OR (“true hybrid”). The study by Versaci et al. evaluates a “same-day

hybrid” strategy for the treatment of combined carotid artery and coronary artery disease (CAD).

Why Hybrid Procedures Matter

With the increased complexity of patients referred to the cath lab and to surgery, a team approach combining the best available tools of both specialties seems appealing to minimize the procedural risk. We and others have documented improved patient outcomes when this approach is used in selected patients (2). Examples of hybrid strategies include hybrid coronary artery bypass grafting (CABG)/percutaneous coronary intervention, hybrid valve/percutaneous coronary intervention, and hybrid CABG/carotid artery stenting (CAS), the subject of the Versaci’s report (1).

Background

Large trials have shown the efficacy of carotid endarterectomy (CEA) for the prevention of stroke in symptomatic as well as asymptomatic patients with severe carotid artery stenosis (3,4). In CEA patients with concomitant significant CAD, the risk of perioperative myocardial infarction and early and late death are increased. Conversely, in patients undergoing CABG, uncorrected severe carotid disease increases the risk of adverse neurologic events (5). The optimal management of these co-existing conditions and the timing and sequence of correcting them remain controversial. Over the past 2 decades, staged CEA followed by CABG, staged CABG followed by CEA, or combined CABG/CEA in 1 operative setting have each been advocated.

What Makes Versaci’s Study Unique

In the modern era, CAS has emerged as an alternative to surgical CEA for the treatment of severe carotid disease. A recent meta-analysis of 8 trials, analyzing 2,942 patients, comparing CAS versus CEA documented that CAS and CEA had similar risk of stroke or death (6). Thus, in patients with co-existing CAD and carotid disease, a staged approach with either CAS or CABG performed first followed later (typically during a different hospital stay) by the other procedure (“2-hospitalization hybrid”) or CABG/CAS performed on 2 separate days in 1 hospital setting (“1-hospitalization hybrid”) has become an alternative in these patients. In a study comparing CAS followed later (same hospital stay) by CABG versus combined single-stage surgical CABG/CEA, after propensity score match, the adverse events (death, stroke, or myocardial infarction) were similar for both procedures despite the CAS followed by CABG group being higher risk (7). Versaci et al. (1) have compressed the staging further by performing “same-day hybrid” CAS/CABG. The title is slightly misleading, how-

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ever, because the 2 procedures were not “simultaneous” (as is possible only in “true hybrid” using a combined hybrid cath lab/OR) but rather “same-day,” separated by hours with 2 separate operative suites during the same day. That is, immediately after CAS, the patients were transferred to the OR for on-pump CABG. This strategy is suggested to reduce the risks of cardiac events while awaiting CABG. Moreover, most patients prefer 1 procedural day rather than 2 and certainly prefer 1 hospital stay rather than 2.

Discussion

Carotid artery stenting can be performed without general anesthesia, so that neurologic status can be monitored during the procedure. This is especially appealing in patients who need CABG the same day, because stroke is a known risk of CABG regardless of the status of the carotid arteries.

Versaci et al. (1) confirm that “same-day” CAS/CABG is safe and feasible with very good perioperative outcomes. The authors report this “same-day hybrid” approach in 101 consecutive patients with severe combined carotid and coronary disease. Of the 101 patients, 55% had bilateral carotid artery stenosis but only 15% were symptomatic. Two (2%) patients suffered a stroke after CAS, and 2 (2%) patients died. Some questions remain, such as the timing of antiplatelet agents as well as the potential nephrotoxic effects of angiographic contrast—used for CAS—immediately before CABG. We and others (8), however, have shown these do not pose major adverse risks.

Versaci’s study does not address which subset of CABG patients benefit most by use of CAS versus CEA before or during CABG or whether off-pump CABG combined with CAS can further reduce complications. Also, the authors do not address the idea of a “true hybrid,” that is, a combined procedure in a hybrid cath lab/OR. In such a multipurpose cardiovascular operating suite, patients can undergo CAS followed immediately—within minutes, in the same operative setting—by both procedures (8). This improves efficiency, reduces cost, and might help reduce the risks of patient transfers and hand-offs.

The authors, however, should be congratulated for combining the different tools available to the cardiovascular surgeon and interventionalist in treating patients with combined complex CAD and carotid disease. We agree with this “combined tool box” approach, to meet the needs of an increasingly complex patient population (9).

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