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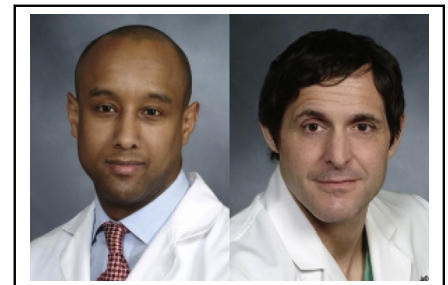
Commentary: Covert or overt? Depends on how hard you look

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Stroke remains the Achilles heel of coronary artery bypass grafting (CABG). CABG studies not specifically designated to look at perioperative stroke likely underestimate the incidence of this complication due to ascertainment issues and the competing risk of death.^{1,2}

In the current article Browne and colleagues³ analyze the association of *covert* stroke (asymptomatic acute infarcts on magnetic resonance imaging [MRI]) after CABG with intraoperative cerebral oxygen desaturation events and postoperative cognitive function. Of the 49 of 66 patients who completed an MRI and had interpretable images, 39% had a covert stroke and 6% a clinical stroke. Cerebral oxygen desaturation events were twice as common in patients with covert stroke (67% vs 32%; $P = .02$). Postoperative delirium occurred in 26% of patients with compared with 10% of those without covert stroke. The analysis was performed as a feasibility study for future large multicenter prospective studies of covert stroke after CABG.³ Such a study would be both valuable and, as the current study suggests, feasible.

Strategies to prevent perioperative stroke have focused on minimizing aortic manipulation, as this has been demonstrated to correlate with both overt *and* covert stroke rates.^{4,5} Randomized trials of off-pump CABG have not demonstrated a benefit with regards to stroke,⁶⁻⁸ cognitive outcomes,^{7,9} or mortality.⁶⁻⁸ However, off-pump CABG with the use of lateral aortic clamping does not reduce aortic manipulation and in these trials the off-pump technique was not defined by protocol. Any large-scale study proposing to assess the impact of covert stroke on cognitive function after CABG should



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CENTRAL MESSAGE

Covert stroke after CABG is an underappreciated phenomenon and likely related to the degree of aortic manipulation. Any correlation with cognitive outcomes will require rigorous assessment to discern.

consider incorporating an analysis of such techniques. In addition, cognitive outcomes likely correlate with the number and size of new lesions, not simply their presence, similar to that seen after transcatheter aortic valve replacement (TAVR).^{10,11} Therefore, accurate assessment of lesion burden is mandatory, and preoperative MRI should be considered to control for the degree of baseline cerebral lesion burden.

The experience with cerebral protection devices during TAVR has taught us that debris is liberated from the aorta/aortic valve complex in all such procedures, with the majority of patients demonstrating radiographic infarcts on MRI.^{10,11} This is analogous to the presence of “hits” on transcranial Doppler ultrasonography ubiquitously noted during CABG at the time of aortic manipulation.¹² What is more difficult to measure is the cognitive effect of these embolic events. Perhaps “delirium” is a more sensitive marker of covert stroke than elaborate neurocognitive assessment batteries.^{3,12} Perhaps the effect of the emboli is more evident in older patients? If we could identify the clinical relevance of these “covert” strokes, implications for surgical conduct would be tremendous. Anaortic techniques during CABG may be required to yield “covert” stroke rates comparable with percutaneous interventions. Perhaps cerebral protection devices will find their place in cardiac surgery as they have in TAVR.¹³ What is clear is that aortic manipulation leads to cerebral injury. Whether this injury is covert or overt is a matter of how hard we look.

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Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Aug 27, 2020; revisions received Aug 27, 2020; accepted for publication Aug 28, 2020; available ahead of print Oct 20, 2020.

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JTCVS Open 2020;4:12-3

2666-2736

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<https://doi.org/10.1016/j.xjon.2020.08.017>

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