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Commentary: Does a “less is more” approach reduce delirium in patients undergoing coronary artery bypass grafting?

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Delirium and postoperative cognitive dysfunction (POCD) are common in patients who undergo cardiac surgery with cardiopulmonary bypass.¹ There is an ongoing debate regarding the neurocognitive benefits of off-pump coronary artery bypass grafting (OPCAB) relative to on-pump procedures. A proposed theory with the use of OPCAB is the reduced neuroinflammatory response, with subsequent attenuation in neuropsychiatric complications such as delirium and cognitive decline²; however, this notion remains to be elucidated. In their study in this issue of the *Journal*, Szwed and colleagues³ have sought to address this knowledge gap by studying a subset of patients within a single-center, randomized controlled trial (NCT03074604).

Szwed and colleagues³ compared 3 OPCAB techniques in 191 elective patients: (1) conventional OPCAB with vein grafts (n = 64); (2) OPCAB (with a partial clamp for proximal anastomoses) in which carbon dioxide was applied by field flooding (n = 64); and (3) anaortic (ie, “no-touch”) OPCAB without manipulation of the ascending aorta (n = 63). The main outcomes reported here were the incidence of delirium according to the Confusion Assessment Method for the Intensive Care Unit within 7 days of surgery and cognitive dysfunction (a 20% reduction in at

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CENTRAL MESSAGE

Off-pump CABG without aortic manipulation may have neurocognitive protective benefits. It will be enlightening to determine the mechanisms of reduced risk and whether the frail patient can benefit.

least 2 domains in a battery of neurocognitive tests) 7 days postoperatively. In the study, the incidence of delirium was lower with anaortic OPCAB (12.5%) than with either carbon dioxide field flooding (32.8%) or conventional OPCAB technique (36%). Cognitive performance 7 days after surgery followed a similar trend: anaortic OPCAB had the lowest incidence of cognitive decline (9.5%), followed by CO₂ field flooding (28.1%), and then conventional OPCAB (34.4%), mirroring previous observational studies.⁴ Interestingly, the relative ratio of delirium to postoperative cognitive decline followed a similar pattern (76% vs 85% vs 95%) for anaortic, carbon dioxide field flooding, and conventional OPCAB, respectively.

The participants in this study were relatively young (approximately 65 years old) with a low risk for perioperative mortality (approximately 1%). Although in-hospital mortality for OPCAB remains low, the incidence of neuropsychiatric complications is often higher in older and frailer patients.^{5,6} It may be of greater interest to understand the effect of anaortic OPCAB on neuropsychiatric function within a frailer surgical patient population.⁷

Important to note was the high frequency of antipsychotic use (approximately 24%) reported in this study. Current society guidelines recommend prescribing antipsychotics only for patients who have significant distress secondary to symptoms of delirium such as anxiety, fearfulness, and

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hallucinations.⁸ The predominant delirium motoric subtype were hypoactive, so it is unclear why the rate of antipsychotic use was this high. Furthermore, if delirium duration was affected by the surgical technique used, such a high antipsychotic prescription may have a long-term impact on POCD.⁹

Szwed and colleagues³ hypothesize that the use of the anaortic technique would avoid a major source of solid microemboli, but this was not directly measured in their analysis. Further, others have suggested that atherosclerotic burden, rather than microemboli, increases the risk of POCD.¹⁰ This study by Szwed and colleagues³ starts an important discussion of tailoring a surgical technique to patients with a higher risk for delirium and POCD. The planned magnetic resonance imaging analysis in the parent study may provide new mechanistic data by which an anaortic OPCAB may reduce the risk of these important patient-centered outcomes, and it will be of interest.

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