screening as a best practice, just has long been the standard for carotid screening. But as emphatic as this conclusion is, their study does lead to further questions and challenges. Most prominent is the need for a risk-reduction strategy or protocol. Knowledge is power. Armed with the new findings, our cardiothoracic surgery community now has an expanded capability to formulate risk-reduction strategies, and the time has come for us to take note and to determine our next steps in moving forward.

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Commentary: It's all in your head

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Ischemic stroke remains among the most serious potential complications following cardiac surgery. With a reported incidence of 1.6% to 5.5%, stroke leads to increased mortality coupled with long-term disability in >50% of patients.¹ The cause of ischemic stroke is multifactorial, with embolism and hypotension during surgery known predisposing factors. Cerebral atherosclerosis (CAS), particularly of the major intracranial arteries (ICAS), is an increasingly identified cause of stroke worldwide, particularly prevalent in Asian, African American, and Hispanic populations.²⁻⁴ Despite these observations, reports of ICAS related to stroke in the setting of cardiac surgery

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CENTRAL MESSAGE

ICAS is an important predisposing factor for ischemic stroke following cardiac surgery.

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are limited. Kim and colleagues⁵ analyze CAS and stroke following left-sided valve replacement surgery. A prospective cardiac surgery database housed at Asan Medical Center (Seoul, Korea) was analyzed retrospectively to identify 2085 patients who underwent preoperative magnetic resonance angiography (MRA) before elective valve replacement surgery over a 10-year period (2005-2015). The extent of CAS, both ICAS and extracranial CAS were scored by MRA and 30% of the study population had significant CAS (>50% stenosis) identified. A total of 54

(2.6%) patients were diagnosed with ischemic stroke (new neurologic deficit validated by cerebral imaging within 30 days). Patients with stroke more often underwent concomitant coronary artery bypass graft (CABG), had longer cardiopulmonary bypass times, and had higher CAS scores. Multivariable logistic regression demonstrated that the total CAS score along with prolonged cardiopulmonary bypass and concomitant CABG independently predicted the incidence of stroke. Notably, only the ICAS score correlated independently with increased stroke risk (odds ratio, 1.44). Furthermore, the authors observed that among the patients with stroke a minority (24%) had atherosclerotic strokes at the site of pre-existing stenosed arterial territories. Therefore, the identification of ICAS may confer an increased risk or susceptibility to hypoperfusion or emboli unrelated to the specific anatomic location of CAS.

CAS is an increasingly recognized important risk factor for ischemic stroke worldwide, and in patients undergoing CABG.^{3,4,6} This study is the first to demonstrate the importance of ICAS and ischemic stroke following valve replacement surgery in a high-risk population (high prevalence of CAS in Asians); however, important limitations of this single institution, retrospective analysis warrant attention. Patient selection and surgical management lacked standardization and the surgical teams were not blinded to the results of preoperative MRA. In addition, improved imaging techniques, anatomic characterization, and treatment guidelines for ICAS are now available. The authors highlight ICAS as an important predisposing factor for postoperative stroke without proposing a perioperative management strategy.⁷

Given the current interventional therapeutic options and significant advances in acute stroke care, characterization of ICAS in high-risk patients before cardiac surgery seems prudent. For example, preoperative identification and randomization of best medical therapy versus intracranial stenting similar to the Stenting versus Aggressive Medical Management for Preventing Recurrent Stroke in Intracranial Stenosis trial could be considered.⁸ Finally, the authors have demonstrated that ischemic stroke may well be all in your head in terms of portending stroke after valve replacement. But what lies ahead awaits further description.

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