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 find-
ings, 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.

References
1. Hogue CW, Murphy SF, Schechtman KB, Dávila-Román VG. Risk factors for
2. Filsoufi F, Rahmani P, Castillo JG, Bronster D, Adams DH. Incidence, topog-
raphy, predictors and long-term survival after stroke in patients undergoing coro-
at extraordinary risk. Multicenter study of perioperative ischemia research group
(McSPI) and the ischemia research education foundation (IREF) investigators. Stroke. 1999;30:514-22.
analysis, and early and late outcomes of stroke after cardiac valve operation.
5. Van der Linden J, Hadjikakou M, Bergman P, Lindblom D. Postoperative stroke
in cardiac surgery is related to the location and extent of atherosclerotic disease in
we perform carotid Doppler screening before surgical or transcatheter aortic valve
rosis and early ischemic stroke after left-sided valve replacement surgery. J Thorac

Commentary: It’s all in your head

Kevin P. Landolfo, MD, MS, a and
William D. Freeman, MD b

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 mort-
tality coupled with long-term disability in >50% of pa-
tients.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, particu-
larly 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
are limited. Kim and colleagues5 analyze CAS and stoke
following left-sided valve replacement surgery. A prospec-
tive cardiac surgery database housed at Asan Medical
Center (Seoul, Korea) was analyzed retrospectively to identify
2085 patients who underwent preoperative magnetic reso-
nance angiography (MRA) before elective valve replace-
ment surgery over a 10-year period (2005-2015). The
extent of CAS, both ICAS and extracranial CAS were
scored by MRA and 30%

0022-5223/$36.00
Copyright © 2020 by The American Association for Thoracic Surgery
https://doi.org/10.1016/j.jtcvs.2020.06.074

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

References