either cerebral infarction or hemorrhage after early surgical treatment, compared with 8% in the late operation group. Facing these results, one should keep in mind the recommendations by the Society of Thoracic Surgeons Clinical Practice Guidelines⁴ to delay surgery for at least 4 weeks if possible for patients who have had a major ischemic stroke or any intracranial hemorrhage.

Finally, we are interested in the results of intraoperative valve cultures and pathologic examination of infected valves. How many patients showed traces of active endocarditis during surgery? Was this associated with the fairly high risk of reoperation during follow-up (9%-12%)?

In conclusion, we could say that this study shows a lower in-hospital mortality in the early surgery group at the expense of worse neurologic outcomes. We think that if one does not know the indications for early surgery, a judgment on the outcomes of surgery will be questionable. Referring to these concerns, we consider the data presented not convincing for dropping a patient-tailored approach in favor of a priori early surgical treatment.

Henryk Jan te Kolsté, MD
Wilson Wan Lung Li, MD
Bas A. J. M. de Mol, MD, PhD
Cardiothoracic Surgery
Academic Medical Center
Amsterdam, The Netherlands

References

1. Funakoshi M, Kaji S, Yamamuro A, Tani T, Kinoshita M, Okada Y, et al. Impact of early surgery in the active phase on long-term outcomes in left-sided native valve infective endocarditis. *J Thorac Cardiovasc Surg*. 2011;142:836-42. e1.
2. Dickerman SA, Abrutyn E, Barsic B, Bouza E, Cecchi E, Moreno A, et al. The relationship between the initiation of antimicrobial therapy and the incidence of stroke in infective endocarditis: an analysis from the ICE Prospective Cohort Study (ICE-PCS). *Am Heart J*. 2007;154:1086-94.
3. Habib G, Hoen B, Tornos P, Thuny F, Prendergast B, Vilacosta I, et al. Guidelines on the prevention, diagnosis, and treatment of infective endocarditis (new version 2009): the Task Force on the Prevention, Diagnosis, and Treatment of Infective Endocarditis of the European Society of Cardiology (ESC). Endorsed by the European Society of Clinical Microbiology and Infectious Diseases

(ESCMID) and the International Society of Chemotherapy (ISC) for Infection and Cancer. *Eur Heart J*. 2009;30:2369-413.

4. Byrne JG, Rezai K, Sanchez JA, Bernstein RA, Okum E, Leacche M, et al. Surgical management of endocarditis: the Society of Thoracic Surgeons Clinical Practice Guideline. *Ann Thorac Surg*. 2011;91:2012-9.

<http://dx.doi.org/10.1016/j.jtcvs.2012.03.090>

RESCUE CORONARY ARTERY BYPASS GRAFTING IN ISOLATED LIFE-THREATENING RIGHT VENTRICULAR FAILURE AFTER AORTIC VALVE REPLACEMENT To the Editor:

Coronary ostial damage is a rare but potentially serious sequela after aortic valve replacement. It occurs in the left main or right coronary artery after 1% to 5% of aortic valve replacement procedures. This lethal condition may present with difficulty in weaning from cardiopulmonary bypass pump; echocardiographic signs of major wall motion abnormalities; or electrocardiographic evidence of ischemia, pump failure, and ventricular arrhythmias. The outcomes are usually severe and may appear immediately during surgery. The typical treatment in operating is coronary artery bypass grafting.¹

Here we present the case of a patient with bicuspid aortic valve and severe aortic stenosis who underwent Maastricht surgery associated with aortic valve replacement with a 23-mm diameter mechanical valve (St Jude Medical, Inc, St Paul, Minn), and cardioplegic solution was administered antegradely. Right ventricular failure unexpectedly occurred in the operating room after aortic valve replacement, and the patient could not be separated from the cardiopulmonary bypass pump. This problem was not resolved by medication. Intraoperative transesophageal echocardiography showed a well-functioning mechanical prosthesis with no evidence of paravalvular leakage, air emboli, interfering mechanical aortic valve with the ostial right

coronary artery or any regional wall motion abnormality. Intraoperative transesophageal echocardiography revealed severe right ventricular failure with normal inferior wall motion despite the major perfusion of inferior segment by the right coronary artery. Preoperative echocardiography showed only mild right ventricular dysfunction before surgery. There was no ST elevation on electrocardiographic monitoring. Finally, the patient underwent bypass grafting of the saphenous vein to the right coronary artery with possibility of right coronary artery obstruction. Interestingly, she was successfully separated from the cardiopulmonary bypass pump, and she was well during hospital stay. The follow-up coronary computed tomographic angiography showed obstruction of the right coronary artery ostium by mechanical prostheses. She was discharged, and her midterm follow-up was uneventful.

When right ventricular failure occurs during aortic valvular operation, inadequate myocardial protection may be the culprit. Other causes of right ventricular failure should be considered, such as air or particulate matter embolization. Right ventricular failure that unexpectedly occurs during an aortic valvular operation most probably would be due to a mechanical problem with the right coronary ostium.²⁻⁵

We concluded that when right ventricular failure unexpectedly occurs during an aortic valvular operation and does not improve with reperfusion and auxiliary medications, a mechanical problem in the right coronary artery should be considered even with normal motion in inferior wall and normal findings on electrocardiographic monitoring. This rare complication could be life threatening if not promptly recognized. Consequently, it is important to have a high index of diagnostic suspicion. Rescue coronary artery bypass grafting in this situation would be lifesaving.

Alireza Alizadeh Ghavidel, MD^a
 Anita Sadeghpour, MD, FASE, FACC^b
 Azin Alizadehasl, MD^c

^aAssociate Professor of Cardiac
 Surgery

^bAssociate Professor of Cardiology
 Department of Cardiovascular
 Medicine

Echocardiography Research Center
 Rajaei Cardiovascular Medical and
 Research Center
 Tehran University of Medical Science
 Tehran, Iran

^cAssistant Professor of Cardiology
 Fellowship of Echocardiography
 Department of Cardiology
 Tabriz University of Medical Sciences
 Madani Heart Hospital
 Tabriz, Iran

References

1. Lesage CH Jr, Vogel JH, Blount SG Jr. Iatrogenic coronary occlusive disease in patients with prosthetic heart valves. *Am J Cardiol.* 1970;26:123-9.
2. Salerno TA, Bergsland J, Calafiore AM, Cordell AR, Kon ND, Bhayana JN. Acute right ventricular failure during aortic valvular operation due to mechanical problem in the right coronary artery. *Ann Thorac Surg.* 1996;61:706-7.
3. Ziakas AG, Economou FI, Charokopos NA, Pitsis A, Parharidou DG, Papadopoulos T, et al. Coronary ostial stenosis after aortic valve replacement: successful treatment of 2 patients with drug-eluting stents. *Tex Heart Inst J.* 2010;37:465-8.
4. Turillazzi E, Giammarco G, Neri M, Bello S, Riezzo I, Fineschi V. Coronary ostia obstruction after replacement of aortic valve prosthesis. *Diagn Pathol.* 2011;6:72.
5. Marino M, Cellini C, Tsiopoulos V, Pavone N, Zamparelli R, Corrado M, et al. A case of myocardial infarction effectively treated by emergency coronary stenting soon after a Bentall-De Bono aortic surgery. *Cardiovasc Revasc Med.* 2010;11:263.e5-9. Erratum in: *Cardiovasc Revasc Med.* 2011;12:71.

<http://dx.doi.org/10.1016/j.jtcvs.2012.08.024>

NEUROCOGNITIVE OUTCOMES IN OLDER ADULTS AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT

To the Editor:

Transcatheter aortic valve replacement (TAVR), an approach developed for older, frail patients at risk for open cardiac operations represents 24% of all procedures for the treatment of aortic stenosis in Germany

and was recently approved by the Food and Drug Administration. Despite the benefits of avoiding open surgery, TAVR has been associated with more than tripling the rate of stroke in inoperable candidates versus medical therapy controls¹ and a doubling of the stroke rate in high-risk participants versus high-risk operative controls.² The incidence of acute hyperintensities or ischemia-like lesions on diffusion-weighted magnetic resonance imaging (MRI) of the brain is double what has been historically reported for surgical aortic valve replacement (AVR).^{3,4} Furthermore, the risk of neurologic events in TAVR patients remains considerably elevated relative to AVR at 24 months after the procedure.² Studies examining outcomes of TAVR have conducted only gross clinical evaluations of neurocognitive function in the relative short term; the longer-term implications of “neurologic events” and MRI lesions for older adults after TAVR and many other cardiovascular procedures have not been extensively studied.

Although it is intuitive to expect less-invasive approaches to yield improved outcomes, recent history has shown that this may not be the case. The less-invasive “off-pump” approach to coronary artery bypass grafting was primarily developed to avoid stroke and cognitive dysfunction thought to be caused by exposure to cardiopulmonary bypass, but studies have not conclusively demonstrated any real benefit in the incidence of stroke or postoperative cognitive impairment. The push to implement the off-pump approach for its perceived neurologic benefits may have actually worsened long-term cardiac outcomes because of the technical challenges associated with revascularizing a beating heart.⁵ In light of this historical perspective, the lack of mortality benefit from TAVR over AVR at 1 year,⁶ increased stroke rate in TAVR patients, and the increase in ischemic lesions on MRI after TAVR, we are left to

wonder just what real benefit this less-invasive approach offers.

The largest long-term studies of neurocognitive outcomes after cardiac procedures have focused on relatively younger patients undergoing bypass grafting and might underestimate the long-term impact in older adults undergoing different cardiovascular procedures associated with higher rates of stroke, cerebral emboli, or greater cognitive decline. Future research on neurocognitive outcomes from TAVR is necessary to determine the neurocognitive risks and benefits associated with this new procedure as well as the potential need for adjunctive neurologic interventions.

Thomas F. Floyd, MD^a
 Tania Giovannetti, PhD^b

^aDepartments of Anesthesiology,
 Neurology, Radiology, and
 Biomedical Engineering
 Stony Brook University
 Stony Brook, NY

^bDepartment of Psychology
 Temple University
 Philadelphia, Pa

References

1. Makkar RR, Fontana GP, Jilaihawi H, Kapadia S, Pichard AD, Douglas PS, et al. Transcatheter aortic-valve replacement for inoperable severe aortic stenosis. *N Engl J Med.* 2012;366:1696-704.
2. Miller DC, Blackstone EH, Mack MJ, Svensson LG, Kodali SK, Kapadia S, et al. Transcatheter (TAVR) versus surgical (AVR) aortic valve replacement: occurrence, hazard, risk factors, and consequences of neurologic events in the PARTNER trial. *J Thorac Cardiovasc Surg.* 2012;143:832-43.e13.
3. Kahlert P, Knipp SC, Schlamann M, Thielmann M, Al-Rashid F, Weber M, et al. Silent and apparent cerebral ischemia after percutaneous transfemoral aortic valve implantation: a diffusion-weighted magnetic resonance imaging study. *Circulation.* 2010;121:870-8.
4. Floyd TF, Shah PN, Price CC, Harris F, Ratcliffe SJ, Acker MA, et al. Clinically silent cerebral ischemic events after cardiac surgery: their incidence, regional vascular occurrence, and procedural dependence. *Ann Thorac Surg.* 2006;81:2160-6.
5. Moller CH, Penninga L, Wetterslev J, Steinbruchel DA, Gluud C. Off-pump versus on-pump coronary artery bypass grafting for ischaemic heart disease. *Cochrane Database Syst Rev.* 2012;3:CD007224.
6. Smith CR, Leon MB, Mack MJ, Miller DC, Moses JW, Svensson LG, et al. Transcatheter versus surgical aortic-valve replacement in high-risk patients. *N Engl J Med.* 2011;364:2187-98.

<http://dx.doi.org/10.1016/j.jtcvs.2012.08.050>