Should the risk of a permanent pacemaker be considered when choosing a procedure for aortic stenosis?

Scott Goldman, MD

From the Structural Heart Disease Program, Lankenau Heart Institute, Lankenau Medical Center, Wynnewood, Pa.

Disclosures: S.G. is a consultant for St Jude Medical, Edwards Lifesciences, and Abbott.

Received for publication July 4, 2017; accepted for publication July 10, 2017; available ahead of print Aug 8, 2017.

Address for reprints: Scott Goldman, MD, Lankenau Medical Center, 100 Lancaster Ave, Suite 280, Wynnewood, PA 19096 (E-mail: goldmans@mlns.org).

J Thorac Cardiovasc Surg 2017;154:1566-7

0022-5223/\$36.00

Copyright © 2017 by The American Association for Thoracic Surgery

<http://dx.doi.org/10.1016/j.jtcvs.2017.07.006>

In this issue of the *Journal*, Hwang and colleagues¹ present an observational study of 663 patients with pathologically proven degenerative aortic stenosis who underwent isolated surgical aortic valve replacement (SAVR). Hwang and colleagues¹ investigated the incidence of conduction disturbances and the need for a permanent pacemaker (PPM) in patients after the operation. Findings showed that although immediate postoperative conduction disturbances were common, with intraventricular conduction disorders occurring in 8.4% and atrioventricular block occurring in 10.3%, only 1.5% of patients with symptomatic second- or third-degree atrioventricular block underwent PPM implantation within 30 days of SAVR. Of note, Hwang and colleagues¹ allowed a 2-week waiting period for return of adequate atrioventricular conduction. On follow-up, only 4 of the 10 patients who received a PPM remained dependent on the device. Further, only 1 patient required a PPM beyond 30 days (44 months). It represents a retrospective look at a data set without clear prospectively defined definitions or criteria for PPM implantation and, of course, with no control group.

This series is consistent with other published data, in which the reported incidence of PPM is between 1% and 6%. The multivariate analysis showed that advanced age, low body mass index, congestive heart failure on presentation, coronary artery disease, mechanical valve implantation, larger prosthetic valve size, and no previous history of hypertension were significant predictors for intraventricular conduction disturbances.

These data are important for several reasons. First, this is a series of pure isolated SAVR for aortic stenosis. These data therefore may be used for comparison with a similar cohort of patients at low risk with aortic stenosis considering transcatheter aortic valve replacement (TAVR). Further, this provides evidence to suggest that although conduction disturbances are common after isolated SAVR, recovery of adequate atrioventricular conduction is likely. For example, later requirements for PPM were rare, even

Scott Goldman, MD

Central Message

After surgical aortic valve replacement, conduction disturbances are common but usually reversible. Should the risk of a permanent pacemaker be considered when choosing a procedure for aortic stenosis?

See Article page 1556.

in the face of immediate postoperative conduction disturbances that did not lead to the need for PPM. Practitioners should therefore be aware that if stable temporary pacing is achieved, one could wait for return of atrioventricular conduction.

The findings of Hwang and colleagues¹ suggest that implanting physicians should use caution when selecting oversized surgical valves for patients in consideration of future valve in valve TAVR procedures, because this puts patients at higher risks for needing a PPM. In addition, an oversized valve may lead to poorer hemodynamic results.²

Evidence has demonstrated the benefits of TAVR for patients at high and intermediate risk who otherwise would not have undergone SAVR. For this reason, current clinical trials are underway to explore TAVR as a less invasive procedure in patients at low risk. Rapid deployment and sutureless valves may enable a less invasive operation and shorter pump and clamp times. Transcatheter, rapid deployment, and sutureless valves have reported PPM rates higher than that reported for SAVR.³⁻⁶

Of greatest importance is the recognition that permanent symptomatic atrioventricular block and the requirement for PPM after an AVR may have a negative impact on long-term patient outcomes.⁶ SAVR is a safe procedure,

particularly for patients at low risk. It is therefore imperative that the benefits of the TAVR procedure or implantation of a rapid deployment and sutureless valves be weighed against the increased risk of the need for PPM relative to a low-risk SAVR.

References

1. Hwang YM, Kim J, Lee JH, Kim M, Hwang J, Kim JB, et al. Conduction disturbance after isolated surgical aortic valve replacement in degenerative aortic stenosis. *J Thorac Cardiovasc Surg*. 2017;154:1556-65.e1.
2. Cleveland JD, Bowdish ME, Eberhardt CE, Mack WJ, Crabtree JA, Vassiliades TA, et al. Evaluation of hemodynamic performance of aortic valve bioprotheses in a model of oversizing. *Ann Thorac Surg*. 2017;103:1866-76.
3. Shrestha M, Fischlein T, Metris B, Flameng W, Carrel T, Madonna F, et al. European multicentre experience with the sutureless Perceval valve: clinical and haemodynamic outcomes up to 5 years in over 700 patients. *Eur J Cardiothorac Surg*. 2016;49:234-41.
4. van Boxtel AG, Houthuizen P, Hamad MA, Sjatskig J, Tan E, Prinzen FW, et al. Postoperative conduction disorders after implantation of the self-expandable sutureless Perceval S bioprosthesis. *J Heart Valve Dis*. 2014;23:319-24.
5. Kocher AA, Laufer G, Haverich A, Shrestha M, Walther T, Misfeld M, et al. One-year outcomes of the Surgical Treatment of Aortic Stenosis With a Next Generation Surgical Aortic Valve (TRITON) trial: a prospective multicenter study of rapid-deployment aortic valve replacement with the EDWARDS INTUITY Valve System. *J Thorac Cardiovasc Surg*. 2013;145:110-5; discussion 115-6.
6. Fadahunsi OO, Olowoyeye A, Ukaigwe A, Li Z, Vora AN, Vemulapalli S, et al. Incidence, predictors, and outcomes of permanent pacemaker implantation following transcatheter aortic valve replacement: analysis from the U.S. Society of Thoracic Surgeons/American College of Cardiology TVT Registry. *JACC Cardiovasc Interv*. 2016;9:2189-99.