Surgical or Transcatheter Aortic-Valve Replacement

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To the Editor:

Reardon et al. (April 6 issue) report the results of the Surgical Replacement and Transcatheter Aortic Valve Implantation (SURTAVI) trial. They state that transcatheter aortic-valve replacement (TAVR) was a noninferior alternative to surgery in patients with severe aortic stenosis who were at intermediate surgical risk.

In older adults, cognitive decline is a potential complication of many surgical procedures, including aortic-valve replacement. Cognitive decline may not be reversible and may cause devastating consequences with respect to function, communication, and quality of life. Reardon et al. did not consider postprocedure cognitive decline as an outcome, and previous studies comparing TAVR with surgical aortic-valve replacement in intermediate-risk patients have not addressed this issue. TAVR is gaining in popularity as a viable alternative to surgery, but data from prospective studies to evaluate the potential for cognitive decline after TAVR in moderate-risk patients are lacking.
TO THE EDITOR: An analysis of the results of the SURTAVI trial arouses some concerns. First, TAVR was associated with better hemodynamic performance that resulted in lower mean aortic-valve gradients and larger aortic-valve areas than surgery. However, 78.1% of patients in the TAVR group received a bioprosthesis that was 29 mm in diameter or larger, and 70.7% of patients in the surgery group received a bioprosthesis that was 23 mm in diameter or smaller. Thus, there may have been a mismatch between the patients and the implanted valves, with the patients in the surgery group receiving valves that were smaller than those of the patients in the TAVR group.1 Does this explain why 9.5% of the patients in the surgery group had a mean transvalvular gradient greater than 20 mm Hg at discharge?

TAVR is only one approach to aortic-valve replacement that is less invasive than conventional surgery involving a full sternotomy. A minimally invasive surgical approach with sutureless valves, which has been associated with excellent postoperative outcomes and has been proposed as an appropriate treatment option for high-risk patients who can undergo surgery, may be a better alternative to TAVR2 than open surgery. A fair comparison between the latest TAVR techniques and a new surgical approach would have reflected the real world of aortic-valve replacement.


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TO THE EDITOR: In the trial by Reardon et al., mortality at 2 years was similar among patients who received a new permanent pacemaker and those who did not, and this rate of death was lower than the rate among patients who had previously received a permanent pacemaker. However, the percentage of patients who received a new pacemaker was high. This is a weakness of self-expanding bioprostheses, especially in the treatment of patients with a long life expectancy.

The authors stated that among the patients who received the Evolut R device (16% of the patients in the TAVR group), the rate of permanent pacemaker implantation of 26.7% was higher than expected. Indeed, the rate of permanent pacemaker implantation was lower in the U.S. registry (16.4%, and 19.7% when the patients who had previously received pacemakers were excluded).1 However, the rate in the SURTAVI trial is similar to that in our study from Geneva (23.9%),2 a study from Israel (20.4%),3 and a study from Germany (20.0%)4 (Table 1).

We think that rates of permanent pacemaker implantation may be influenced by local practice. Can the authors describe the distribution of these rates after TAVR and surgical aortic-valve replacement between countries and centers? In addition, we think that to have a more accurate assessment of the need for new pacemakers after TAVR, in the rate calculation, patients who had received pacemakers previously should be excluded (Table 1).


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Dr. Noble reports receiving fees from Medtronic for serving as a proctor for the Evolut R device. No other potential conflict of interest relevant to this letter was reported.


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The authors reply:
Reyes and colleagues comment that cognitive decline after TAVR could be a serious problem and that the SURTAVI trial and other randomized trials have not specifically looked for cognitive decline. We agree that if cognitive decline occurs, it can be a serious detriment to the patient who undergoes either TAVR or surgery. Data from prospective studies to specifically address this issue are lacking.

Miceli and colleagues raise the question of the size of the valves used in TAVR and surgical aortic-valve replacement in our trial. Surgical valves are labeled according to external diameter, and the actual internal diameter varies between models. The TAVR valves used are labeled according to the inflow diameter of the sealing skirt and not according to the size of the supraannular valve itself. Comparison of these numbers is not meaningful. All the surgeons in this trial had a minimum of 5 years of experience and worked in carefully selected experienced valve centers. These surgeons produced outstanding results with an
exceedingly low mortality. Both minimally invasive surgery and commercially available sutureless valves were allowed in the trial. However, the published data do not suggest that the results of minimally invasive aortic-valve surgery would be better than those of a sternotomy approach in a way that would probably change the results of this trial. Sutureless valves have been introduced into surgical use and appear to provide good hemodynamics but a greater need for new pacemakers and more paravalvular leaks than stented biologic valves, and data on the durability of sutureless valves are lacking. In a randomized trial involving patients who were at high risk for standard surgery, we found that elements of the surgical technique did not influence outcomes.

Noble and colleagues emphasize the ongoing, considerable need for permanent pacemakers in patients who undergo TAVR. Although the clinical implications of these new pacemaker implants remain a matter of ongoing debate, the SURTAVI trial suggests no immediate penalty in terms of survival up to 2 years among elderly patients. We agree that rates of conduction disturbance after TAVR need to improve moving forward when TAVR is performed in young patients with a low operative risk and long life expectancy. We agree with Noble et al. that a revised uniform method to report rates of pacemaker implantation after TAVR using the number of patients who have not received a pacemaker as the denominator should be encouraged.

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