EDITORIAL COMMENT

Transcatheter Aortic Valve Replacement in Transition*

John G. Webb, MD, Sandra Lauck, PhD

In this issue of JACC: Cardiovascular Interventions, De Backer et al. (1) describe the evolving trends in aortic valve replacement (AVR), both surgical AVR (SAVR) and transcatheter AVR (TAVR), for aortic stenosis over the past decade. They report findings from a regional administrative registry database from eastern Denmark for the period from 2005 to 2015. We briefly discuss the implications of these trends both from this experience and from a very similar regional administrative database from western Canada over the same decade (2).

By 2015, TAVR represented 35% of all AVR procedures in eastern Denmark, similar to the 32% rate in British Columbia. In Denmark, indications have been progressively liberalized, and age >80 years alone is considered an indication for TAVR. In Canada, a surgical turn-down is generally required, and age alone does not determine eligibility. Nevertheless, by 2014, 72% of all patients in British Columbia older than 80 years undergoing AVR somehow underwent TAVR, whereas only 28% had open surgery (Cardiac Services BC).

AVR rates are increasing. Over the past decade, the total volume of AVR in British Columbia has increased more than 100%, double the 50% increase in eastern Denmark. Although one might attribute the increase in AVR solely to an increase in TAVR, this is not the case. Surprisingly, growth in British Columbia over this period has been numerically similar for both SAVR and TAVR, likely attributable to increased awareness, referral, and willingness to perform surgery in patients with aortic stenosis. Surgical volumes have not been affected. Similarly, in Denmark, SAVR volumes rose by 15% from 2005 to 2012. However subsequent to 2012, SAVR volumes showed a slight decline. One might speculate that as indications become more liberal, TAVR is beginning to consume a larger share of what has become a larger pie.

TAVR is changing SAVR. De Backer et al. (1) report a “collateral” shift in the age at which more biological than mechanical surgical prostheses were used from 68 years in 2005 and 2006 to 61 years in 2013 and 2014. A future in which structural failure of bioprosthetic valves can be managed with valve-in-valve implantation has been cited as one reason for this trend (1,3). However some cautionary points about planning for valve-in-valve implantation should be considered (4). Most important, a small surgical implant may not allow optimal transcatheter valve expansion, resulting in unacceptable gradients, thrombosis, and reduced durability. Some surgical valves and techniques may predispose to coronary obstruction, with a subsequent valve-in-valve procedure. For this strategy to be optimized, surgeons will have to consider which specific bioprosthesis (e.g., large internal diameter, short posts), specific patient anatomy (e.g., large root, high coronary arteries, bypass grafts), and surgical technique (e.g., root enlargement) will allow subsequent valve-in-valve implantation. Surgical valves specifically optimized for valve-in-valve implantation when they fail will enter clinical trials soon.

TAVR may increase more. This trend toward more and more TAVR seems likely to continue. The use of Society of Thoracic Surgeons cutoff scores for establishing health policy is problematic. Current surgical risk models do not reliably predict an individual’s risk for an adverse outcome with surgery and even less reliably predict TAVR risk. Although most patients currently undergoing TAVR are at high surgical risk,
they differ dramatically in terms of their risk with TAVR.

Patients are becoming vocal about their demand for access to minimally disruptive treatment, while their physicians are increasingly requesting TAVR when severe aortic stenosis is first diagnosed. Recently, the randomized PARTNER 2A (Placement of Aortic Transcatheter Valves) trial reported superior outcomes for intermediate-risk patients with transfemoral TAVR as compared to SAVR (5). Soon we will hear of new trials directly comparing SAVR with even more mature TAVR procedures and in even lower-risk patients. Although speculative, the weight of evidence may favor TAVR as a default strategy for most patients, with SAVR assuming a secondary role as an alternative for patients with contraindications to TAVR or who require combined interventions.

Ongoing evaluation is needed. Shifts in practice may happen rapidly and must be synchronized with health policy, funding models, operational plans, and ongoing evaluation. The examination of changes in quality of life, resource utilization, cost, and the potential futility of treatment highlighted for TAVR should be matched by similar scrutiny for SAVR. Capturing these differences and developing a common framework to evaluate the treatment of aortic stenosis will be increasingly relevant. The use of administrative registry data will be essential for planning and evaluation as our aortic valve therapies evolve.

**REFERENCES**


**KEY WORDS** aortic stenosis, aortic valve, surgery, transcatheter