A stentless strategy for the small annulus

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Selection of the ideal approach for managing severe aortic stenosis represents one of the more complex decisions facing the cardiac surgeon in the current era. Although the debate regarding mechanical versus bioprosthetic valve selection has dominated conversations in the preoperative clinic for more than a generation, the discussion now must incorporate access strategies (percutaneous, femoral cutdown, transapical, transaxillary, transaortic, full sternotomy, ministernotomy, or parasternotomy), type of prosthesis (transcatheter, sutureless, stented, or stentless), and management strategies for concomitant valvular and coronary artery disease. Despite a number of well-designed recent randomized, controlled trials that have compared various forms of therapy, an evidence-based approach for the individual patient remains elusive because of the numerous variables that play into both short- and long-term outcomes. It is within this context that the current work of Repossini and colleagues¹ published in this issue of the *Journal* provides an excellent framework for evaluating an important subset of these patients—those at intermediate risk with a small aortic annulus (defined as ≤ 23 mm).

Repossini and colleagues¹ have focused their analysis on a comparison of 2 general approaches: transcatheter aortic valve replacement (TAVR) with 1 of 3 early generation prostheses implanted by transfemoral or alternative access approaches and surgical aortic valve replacement (SAVR) with the Freedom SOLO (LivaNova PLC, London, UK) bioprosthesis implanted through a median sternotomy or upper ministernotomy. A propensity-matched comparison of these groups of patients demonstrated an impressive in-hospital mortality benefit in the SAVR group (2.1%) relative to the TAVR group (6.3%). These findings underscore the degree to which clinical experience and operator skill influence outcomes in all types of aortic valve surgery. Repossini and colleagues¹ are to be congratulated on achieving “low risk” outcomes in a selected “intermediate risk” group of patients with a predicted Society of Thoracic Surgeons risk averaging $6.7\% \pm 3.2\%$. By comparison, patients at intermediate risk undergoing SAVR in the Placement of Aortic Transcatheter Valve

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Central Message

In experienced hands, stentless surgical aortic valve replacement may offer benefits relative to transcatheter approaches.

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(PARTNER) 2 trial had a 4.2% 30-day mortality,² and the reported mortalities for the Freedom SOLO valve in non-randomized studies (including patients at low risk) range from 1.5% to 3.7%.³⁻⁵ At the same time, the reported 6.3% mortality among the TAVR cohort of Repossini and colleagues¹ seems higher than what an experienced high-volume center would expect to achieve with the current generation of transcatheter technology. For example, in our experience with 800 TAVR procedures performed at the Mayo Clinic between November 2008 and August 2016, the in-hospital mortality was 2.1%, even though many of these patients were implanted with early generation technology and were at high risk (Greason K, personal communication: numbers based on IRB-approved study data, excluding patients that did not give research consent, 2016).

Even in the setting of comparable short-term mortality data, however, the optimal surgical approach must seek to minimize the invasiveness of the procedure. To that end, one must avoid the temptation to rely solely on the length of the surgical incision to establish the recovery potential for an individual patient. Given the findings of the study of Repossini and colleagues,¹ which demonstrated both a shorter intensive care unit stay and lower rates of pacemaker implantation, adult respiratory syndrome, renal failure, and vascular injury with SAVR, a strong argument can be made for considering a stentless prosthesis in this group of patients at intermediate risk with a small annulus.

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