

Prosthesis–patient mismatch: Don't forget this match!



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Central Message

The Avalus bovine bioprosthetic valve is associated with promising 1-year follow-up. Longer follow-up will be needed to determine the durability of the prosthesis and the rate of prosthesis–patient mismatch.

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In this issue of the *Journal*, Sabik III and colleagues¹ report their experience with a novel bovine pericardial stented aortic bioprosthesis named AVALUS (Medtronic, Minneapolis, Minn). A total of 864 selected low-risk patients underwent isolated aortic valve replacement or combined with other cardiac procedures in 36 sites worldwide. Among 864 patients who received the study valve, 577 completed the 1-year follow-up. In this trial, the authors reported a low early mortality (1.2%) and a high 1-year survival (96.4%). Furthermore, the late linearized rates for thromboembolism (1.7%), prosthetic valve leakage (0.6%), endocarditis (1.3%), and explant (0.7%) were comparable with other studies. Functional class improved dramatically and at 1-year follow-up, 73.7% of 577 patients were in New York Heart Association functional class I. Last but not least, mean aortic peak gradient was reduced strongly and at 1-year follow-up was 12.5 ± 4.4 mm Hg. By these early and late clinical and hemodynamic excellent results, the authors can demonstrate that the new AVALUS bioprosthesis is associated with low overall mortality, low valve-related adverse events, and excellent hemodynamic performances comparable with all other stented bovine bioprosthesis.²⁻⁷

Nevertheless, some topics of this study must be addressed. One non-negligible aspect concerns the incidence of prosthesis–patient mismatch (PPM); the authors reported a surprising incidence of moderate (43.6%) and severe (22%) PPM at 30 days with a slight increase at 1-year follow-up (46% and 29.5%, respectively). It is known that at the time of surgery the surgeon needs to reduce the risk of PPM, which is associated with worsening hemodynamics, decreased regression of the left ventricular mass, increased incidence of cardiac events, reduced survival, and early degeneration of the bioprosthesis.⁷

The authors failed to give an explanation of their high rate of PPM, which does not correspond to the improvement of the clinical status nor to the favorable reduction of the mean transprosthetic gradient. It would have been, for instance, very interesting to know the trend of the variation

of the left ventricular mass during the follow-up, aiming at studying any correlation with PPM. Many factors may cause PPM, such as an unsuitable sizing of the prosthesis, the geometry of the bioprosthesis, and a very small aortic annulus that may affect the sizing. Therefore, for those reasons we understand that it is difficult to provide an explanation about this issue. Another topic concerns the incidence (2.5%) of major bleeding per valve-year, most of which occurred in patients who were on antithrombotic therapy before surgery. Major bleedings are reported with varying incidence in different studies, and often the cause is multifactorial and does not depend on by the bioprosthesis per se.

That said, the eminent authors of this study have to be congratulated for their results, which demonstrate the new AVALUS valve to be competitive with other bovine bioprostheses already well known and used worldwide. However, we have to keep in mind that PPM could become a challenging match to face. We are looking forward to reading a new study of theirs on this issue.

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