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PREVENTING PROSTHESIS-PATIENT MISMATCH: WITH THE CORRECT VALVE, WITH A CORRECT FORMULA, OR WITH BOTH?

To the Editor:

We read with great interest the article of Sabik and colleagues¹ reporting 1-year outcomes with a novel stented bovine pericardial aortic bioprosthesis (PERIGON pivotal trial). It is striking that they report a 1-year prosthesis-patient mismatch (PPM) rate of 75.5%, with a severe PPM rate of 30.3%. Considering the negative impact of PPM on postoperative left ventricular mass regression, functional improvement and quality of life, heart failure, and long-term survival after aortic valve replacement,² this high rate of PPM may pose a problem for the widespread use of this novel bioprosthesis.

There may, however, be at least a partial explanation for the observed high PPM rate in the PERIGON population. Standard cutoffs for adjudicating PPM in a patient are an indexed effective orifice area of 0.85 to 0.65 cm²/m² for moderate PPM and less than 0.65 cm²/m² for severe PPM.² Recent studies have identified that PPM has less of an impact on survival in obese patients,³ most likely because of the smaller metabolic requirements of adipose tissue than other tissues. The Valve Academic Research Consortium has therefore recommended the use of a different, more liberal indexed effective orifice area cutoff of 0.70 to 0.60 cm²/m² for moderate PPM and less than 0.60 cm²/m² for severe PPM in obese patients with a body mass index (BMI) of at least 30 kg/m²,⁴ which has even been lowered to an indexed effective orifice area of 0.70 to 0.56 cm²/m² for moderate PPM and less than or equal to 0.55 cm²/m² for severe PPM in the more recent guideline for the imaging assessment of prosthetic heart valves.^{4,5} These adjusted cutoffs for PPM are particularly relevant in contemporary

studies because of today's obesity epidemic.⁶ The average BMI of patients undergoing aortic valve replacement is increasing.⁷ The share of obese patients (BMI ≥30 kg/m²) was 44% in a recent clinical trial investigating another novel prosthetic heart valve.⁸ Although the BMI was not reported in the PERIGON study, the mean body surface area of 2.0 ± 0.2 m² seems to be somewhat higher than expected in a nonobese adult population, suggesting that the study included many obese patients.⁹ Nevertheless, the adjusted cutoffs for defining PPM in obese patients were not applied in the PERIGON study, and the rate of PPM is therefore overestimated. We urge Sabik and colleagues¹ to adjust the criteria for PPM in obese patients in future analyses of PPM.

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