

Author has nothing to disclose with regard to commercial support.



IS IT TIME FOR PROSTHESIS-PATIENT MISMATCH PARADOX?

Reply to the Editor:

Obesity is an established risk factor for the development of cardiovascular diseases. Several studies have demonstrated that obesity is unexpectedly associated with better survival in patients with existing heart failure. This concept is named the “obesity paradox.”^{1,2}

In obese patients who have undergone aortic valve replacement, the prosthesis-patient mismatch (PPM) seems to have no significant impact on survival. For this reason, the PPM cutoff were redefined.³ Nevertheless, extreme caution should be necessary when facing paradoxical results in light of current concepts and pathophysiology.

Both body mass index (BMI) and body surface area (BSA) reflect body habitus. However, BMI is not both a direct measure of obesity and a mean to correct weight for height. BSA correlates more closely with physiologic parameters than with body weight.⁴⁻⁶ In the US National Institutes of Health guidelines, the use of the BMI to assess overweight and obesity has a level of evidence of C and, to our knowledge, these recommendations have not been updated since 1998.⁷

Recently, Gupta and Strom⁸ hypothesized that indexing effective orifice area (EOA) by substituting fat-free mass (FFM) with weight could reduce the degree of PPM in patients with small aortic annulus. They concluded that obese patients with aortic pericardial prosthesis valves have a greater percentage of severe PPM compared with nonobese patients, whereas severe PPM appeared to be reduced in obese patients' EOA if indexed with BSA-FFM, mainly in women with 19- and 21-mm valves.

Preoperatively, multiplying the patient's BSA by 0.85 (for BMI ≥ 30 kg/m²) or by 0.70 (the recommended cutoff for obese patients) might give information about both the real minimum EOA and the minimum size of a specific prosthesis to prevent mismatch.^{9,10} Intraoperatively, an option is to implant a newer generation of biological or mechanical prosthesis with a larger EOA or a stentless valve. Otherwise, an aortic root-enlargement procedure may be considered in small aortic annulus. Finally, in the case of frail or elderly patients, a PPM may be accepted.

Aortic bioprosthetic stented valves implanted in the supra-annular position show a significantly better hemodynamic performance than in the intra-annular position with a significant reduction of incidence of valve PPM.

In the Pericardial Surgical Aortic Valve Replacement (PERIGON) study,¹¹ 84.3% and 14.9% of bioprostheses were implanted in the supra-annular position and intra-annular position, respectively. Although there was an increase in PPM as determined by indexed EOA, no corresponding increase in clinically significant mean aortic gradient was detected. We do not know which implantation technique was used for the smaller prosthesis, but at 1-year follow-up PPM was more evident in patients with a 19-mm to 23-mm valve size, strongly confirming the importance of the valve sizing as we stated in our commentary.¹² Furthermore, only 577 patients completed the 1-year evaluation, so we wait for a more complete and longer follow-up.

Currently, it is difficult to find the right compromise in obese patients. Since surgeons are facing an increasingly obese population, we agree with Darko and colleagues¹³ about the importance of better defining the criteria of PPM in such patients and maybe introducing the PPM paradox concept.

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<https://doi.org/10.1016/j.jtcvs.2018.09.084>



PROSTHESIS-PATIENT MISMATCH

DEFINITION(S): LET'S AGREE TO AGREE

Reply to the Editor:



In their letter to the editor, Dr Durko and colleagues¹ advocated using the Valve Academic Research Consortium-2² adjusted criteria defining prosthesis-patient mismatch (PPM) in obese patients in the PERIGON trial of a novel aortic bioprosthesis.³ Their letter described a high rate of PPM in PERIGON (62.6% at discharge and 75.5% at 1 year), and they speculated that this may be due to a greater proportion of obese patients being included in the trial. Two meta-analyses have reported PPM rates of 44%^{4,5} for aortic prostheses; however, these studies included mechanical and tissue valves. One of these studies⁵ found the bioprosthetic valves had an odds ratio of 2.94 for PPM, so the rate of PPM found in PERIGON may be in keeping with expectations. Because outcomes in obese patients tend to be less affected by PPM,⁵ this has led some to suggest adjusting the definition of PPM in such patients.² The Valve Academic Research Consortium-2 guidelines advocating this adjustment were specifically intended for transcatheter valve implantation, but it would make sense for a standard definition to be applied to all types of aortic valves.

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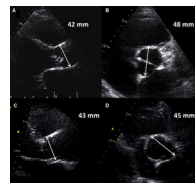
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ECHOCARDIOGRAPHY UNDERESTIMATES THE AORTIC ROOT DIAMETER IN PATIENTS WITH BICUSPID AORTIC VALVE, BUT



SHORT-AXIS IMAGING CAN HELP

To the Editor:

We have read with great interest the article by Plonek and colleagues,¹ which concludes that aortic root diameters can be underestimated by single-plane long-axis echocardiographic measurements when compared with double-oblique computed tomography (CT) angiography maximum measurements, particularly in patients with bicuspid aortic valves (BAVs). We certainly agree with this important concept.² The authors further explain that underestimation of aortic diameters has been analyzed only for abdominal aortic aneurysms, but no study has analyzed the aortic root; therefore, theirs is the first to do so. This is an inadvertent incorrect statement as we have previously reported comprehensive differences comparing 2-dimensional transthoracic echocardiography (TTE) long-axis root measurements (diastolic leading edge to leading edge) with double-oblique CT-angiography maximum root diameters (diastolic inner wall to inner wall) in patients with BAV.² Indeed, we found systematic TTE underestimation of the root by 3.1 ± 2.6 mm by long-axis TTE compared with CT angiography. Therefore, we tested a new mid-diastolic short-axis 2-dimensional transthoracic root measurement method (leading edge to leading edge) (Figure 1) and found unbiased Bland-Altman agreement between that method and CT angiography (diastolic inner wall to inner wall) for root measurement in patients with BAV.² In addition, the underestimation of the BAV root by single-plane TTE and the importance of using inner wall to inner wall measurements with CT angiography