


REPLY

We thank Dr. Shanmugam for his interest in our study (1). Most of the limitations he raises have been discussed in detail in our report. We have never suggested that a cutoff of 40 mm Hg was equivalent to severe pulmonary hypertension. Nonetheless, as we have also alluded to in our study, such levels of pulmonary pressures, equivalent to mild/moderate pulmonary hypertension, have been associated with significantly worse outcomes. Moreover, the fact that such levels of pressure would persist in patients with prosthesis–patient mismatch (PPM), whereas they would regress in most patients without PPM, indeed confirms that levels above 40 mm Hg are clearly abnormal.

The indexed effective orifice area (EOA) is a physiological parameter that relates to the intrinsic hemodynamic performance of the prosthesis and has nothing to do with valve annular diameters. The threshold value of 1.2 cm²/m² was chosen to identify PPM because it was the most discriminative value to identify patients with persisting pulmonary artery hypertension after mitral valve replacement (MVR), and it is consistent with previous in vitro and in vivo studies on mitral PPM. As we have emphasized, the pressure gradient is a much less appropriate parameter with which to assess the consequences of PPM, especially in the mitral position, because it is highly influenced by chronotropic conditions and because mitral flow tends to decrease when pulmonary resistances are increased.

The statement that “the minimum absolute valve EOA of any size–23 prostheses is 2.54 cm²” denotes a gross misunderstanding of valve prosthesis physiology and is equivalent to saying that all prostheses of a given labeled size would have similar hemodynamic performance. Indeed, it is well known that labeled sizes have no relevance to valve hemodynamics and that they grossly overestimate the actual EOA, which may vary from one type of prosthesis to another. In this context, it is interesting to note that the normal reference values of EOA for 27-mm mitral prostheses range from 1.6 to 2.2 cm² (2). Hence, it is not surprising that PPM defined as an indexed EOA ≤1.2 cm²/m² can be a frequent occurrence in patients undergoing MVR.

We agree with Dr. Shanmugam that the prevention of PPM in the mitral position is a particularly demanding challenge for the surgeon and that there are not as many options as in the aortic position. Nonetheless, and as we have shown, it is not a rare occurrence and definitely warrants further documentation. Our results also provide impetus for the development of better performing mitral prostheses.


REFERENCES

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