

The author reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

3. Antunes MJ. Commentary: aortic root enlargement, a useful and reproducible way to a larger prosthesis. *J Thorac Cardiovasc Surg.* 2020;160:924-5.

<https://doi.org/10.1016/j.jtcvs.2020.10.143>



REPLY: FACT OR FICTION: THE BENEFIT OF AORTIC ROOT ENLARGEMENT DURING AORTIC VALVE REPLACEMENT
Reply to the Editor:



De Martino and colleagues¹ present an interesting perspective in their letter, suggesting that cardiac surgeons be trained in aortic root enlargement to prepare them for surgical conundrums they will invariably face in their career. Indeed, a cardiac surgeon's decision to perform root enlargement with aortic valve replacement (AVR) versus isolated AVR is not random, but rather based on tangible and imperceptible variables, including surgeon experience, baseline patient characteristics, and operative anatomy. Bearing this in mind, and acknowledging the lack of definitive randomized evidence on the subject, root enlargement with AVR cannot be assumed to be as safe as isolated AVR based solely on observational evidence.

In their study of 53 patients, Celiento and colleagues² found enlargement of the aortic annulus with AVR to be associated with an actuarial survival of 37% at a mean follow-up of 8.9 years. Tam and colleagues³ reported the safe addition of root enlargement to isolated AVR in terms of early mortality (root replacement with AVR vs isolated AVR: 2.0% vs 2.1%; $P = 1.00$) and late mortality (73.1% vs 75.4%; $P = .17$). Despite rigorous propensity matching, however, their data remain observational and thus must be interpreted in the context of important limitations. An environment of clinical and personal equipoise cannot be assumed in observational studies. Surgeons performing root enlargement are typically more experienced, and treatment allocation and performance biases are important hidden confounders. Preoperative aortic valve area and annular size are other important variables influencing the choice of technique, and in the absence of echocardiographic data, as in the study of Tam and colleagues, it is difficult to state whether root enlargement was performed only in patients who needed it for the placement of a larger valve. Other factors that may have influenced the choice of

operation include patient activity level, age, sex, and left ventricular function.⁴ For instance, the risk-to-benefit ratio of root enlargement would be more acceptable in a younger patient with a long life of vigorous physical activity ahead compared with an elderly, sedentary patient. As Bortolotti and colleagues remark, root enlargement itself is a heterogeneous procedure, and the observations of Tam and colleagues could not factor this in. Based on the current evidence, considering root enlargement with AVR to be associated with similar outcomes as isolated AVR is at best a hypothesis.

Although every effort must be made to avoid significant patient-prosthesis mismatch in AVR, the addition of root enlargement can lead to important complications and requires experience and careful planning. Only randomized allocation of sufficient number of patients to root enlargement with AVR and isolated AVR groups can allow equal baseline distribution of known and unknown confounders. Thus, it must be reiterated that it is only under these conditions that differences in outcomes between the groups can be attributed to true treatment effect and conclusions can be drawn. Until such evidence is available, each patient requires careful subjective and objective assessment to guide the choice of operation.

Irbaz Hameed, MD^a

Mario Gaudino, MD, MSCE^b

^aSection of Cardiothoracic Surgery

Department of Surgery

Yale School of Medicine

New Haven, Conn

^bDepartment of Cardiothoracic Surgery

Weill Cornell Medicine

New York, NY

References

1. De Martino A, Milano AD, Bortolotti U. Facing the small aortic root in aortic valve replacement: enlarge or not enlarge? *J Thorac Cardiovasc Surg.* 2021; 161:e157-8.
2. Celiento M, Saccocci M, De Martino A, Nardi C, Faggioni L, Milano AD, et al. Stability of aortic annulus enlargement during aortic valve replacement using a bovine pericardial patch: an 18-year clinical, echocardiographic, and angiocomputed tomographic follow-up. *J Thorac Cardiovasc Surg.* 2014;147:977-83.
3. Tam DY, Dharma C, Rocha RV, Ouzounian M, Wijeyesundera HC, Austin PC, et al. Early and late outcomes of aortic root enlargement: a multicenter propensity score-matched cohort analysis. *J Thorac Cardiovasc Surg.* 2020;160:908-19.
4. Svensson LG, Adams DH, Bonow RO, Kouchoukos NT, Miller DC, O'Gara PT, et al. Aortic valve and ascending aorta guidelines for management and quality measures. *Ann Thorac Surg.* 2013;95:S1-66.

<https://doi.org/10.1016/j.jtcvs.2020.10.048>