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# Response to Ivey-Miranda and Farrero-Torres “Is there dominance of free wall radial motion in global right ventricular function in heart transplant recipients or in all heart surgery patients?”

Dear Editor,

In our original article—recently published in *Clinical Transplantation*—we concluded that after orthotopic heart transplantation, the radial motion of right ventricular free wall compensates for the decreased longitudinal shortening to maintain ejection fraction.<sup>1</sup> The editorial from Ivey-Miranda and Farrero-Torres questioned whether this finding was true for all heart surgery patients.

Certainly, the answer is positive. As we have discussed in our paper, there is extensive corresponding literature, and the phenomenon is very similar in cardiac surgery patients. However, the magnitude and timing of this functional shift may be different in heart transplant recipients. The aim of our study was to confirm the dominance of radial wall motion in right ventricular function in the case of heart transplant patients using a superior, 3D echocardiographic method compared to previous investigations.<sup>2</sup> We do agree with the authors of the editorial that another, heart surgery group would have been useful. However, retrospective studies are not necessarily useful to answer every question regarding this functional remodelling. An interesting paper from Raina et al<sup>3</sup> reported a direct comparison between heart transplant recipients (n = 54) and patients who underwent coronary artery bypass surgery (n = 23), all with preserved left and also right ventricular global function. In their two-dimensional but thorough echocardiographic analysis, they found no difference between the 2 groups regarding the importance of the different right ventricular motion components. Still, if we look at the time elapsed between the operation and the echocardiogram, the difference between the heart transplant (mean 381 days) versus the coronary cohort (mean 70 days) is problematic. We have already commenced a prospective study with regular and frequent follow-up visits of heart transplant patients using 3D echocardiography. Moreover, the dedicated time points are the same as in the PREPARE-MVR (PREdiction of Early PostoperAtive Right vEntricular failure in Mitral Valve Replacement/Repair patients) study, where we are aiming to evaluate those preoperative factors that can predict early postoperative right ventricular failure or determine the functional shift seen in right ventricular function after mitral valve replacement/repair (NCT03438825). Beyond 3D echocardiography, the PREPARE-MVR study includes right heart catheterization both intraoperatively and in the early postoperative period to correlate

directly the results of invasive hemodynamic measurements with the advanced parameters of right ventricular function. We hope that the upcoming results of the aforementioned studies along with the comparison of these 2 cohorts will deepen our understanding of this interesting and clinically relevant topic.

It is important to note that the adaptation of the right ventricle to increased afterload would imply a decrease in radial function, which bears prognostic value as well.<sup>4</sup> However, radial function is still supernormal after heart transplantation. The selection and even more the results of the “control” population also deserve a comment. Longitudinal shortening was traditionally considered as the main determinant of global right ventricular function in healthy people; however, using the ReVISION method to compare the importance of longitudinal and radial wall motions head-to-head, their relative contribution appears to be equal. A study with a larger sample size is required to confirm this, investigating different age groups and potential gender differences.

In conclusion, we would like to thank the authors of the editorial for their supportive comments and more importantly, for highlighting the knowledge gap and the need for further research in the field of right ventricular function.

## CONFLICT OF INTEREST

None.

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