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Right ventricular function in patients undergoing surgical or transcatheter aortic valve replacement

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Keywords: Aortic valve implantation • Right ventricular function • Echocardiography

We read with great interest the article ‘Right ventricular function after aortic valve replacement: a pilot study comparing surgical and transcatheter procedures using 3D echocardiography’. We did not report RV performance index or isovolumetric contraction (RV IVA) and RV FAC because these quantitative measurements are simple and reproducible, and they do not require sophisticated equipment or prolonged image analysis.

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Reply to Demirkol et al.

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Keywords: Right ventricular function • Three-dimensional echocardiography • Aortic valve replacement • Transcatheter aortic valve implantation

We thank Demirkol et al. for their annotations that we read with great interest. The objective of our study was to evaluate right ventricular (RV) function in patients who underwent aortic valve replacement or transcatheter aortic valve implantation for aortic valve stenosis. Therefore, we assessed, in accordance with current guidelines, RV function by conventional echocardiographic measures, which focus primarily on the measurement of the longitudinal RV contraction (TAPSE and S’)[3]. We did not report RV performance index or isovolumetric acceleration time, as these parameters have not been recommended as routine measures of RV function due to increased susceptibility to loading conditions and lack of data demonstrating their clinical relevance [3].
In order to describe changes in the RV contraction pattern, we used a non-established parameter and measured the transverse fractional shortening of the RV inflow tract. Our data revealed a simultaneous decrease in longitudinal contraction and an increase in transversal contraction, described by transverse fractional shortening, in patients undergoing surgical aortic valve replacement. This phenomenon would not have been assessed by the fractional area change of the RV inflow tract, as this parameter is influenced by the longitudinal shortening of the RV.

RV contraction is a highly complex process. Therefore, advanced techniques are needed to display the different components of RV function, besides the established conventional echocardiographic parameters. Several studies have demonstrated that the global RV function can be most precisely described by 3D ejection fraction, as it represents RV inflow and outflow tract as well as longitudinal and transverse function [4]. The relevance of this technique in the daily clinical routine remains to be evaluated.

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Red cell distribution width may not have a good prospective predictive value in patients with transcatheter aortic valve implantation

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Keywords: Red cell distribution width • Transcatheter aortic valve replacement • Aortic stenosis

We have read the interesting article entitled ‘Red cell distribution width improves the prediction of prognosis after transcatheter aortic valve implantation’ carefully [1]. The authors conclude a positive correlation with high RDW values and post-procedural survival, paravalvular regurgitation and vascular complications in patients undergoing TAVI. First of all, we congratulate the authors for this nice study. We want to add some important points about this study.

The randomization of groups is not suitable in terms of patient demographic variables, which can obviously affect the results of the study. There are significant differences between two groups in terms of NYHA classification (72 vs 89.7%, P = 0.05), systolic pulmonary artery pressure (41 ± 14 vs 50 ± 16 mmHg, P = 0.021), patients’ STS scores (5.0 vs 7.2, P = 0.041), serum creatinine levels (1.00 vs 1.14 mg/dl, P = 0.052) and GFR scores (60 vs 48, P = 0.059). From this point, how can the authors conclude that the mortality, procedural success and vascular complications mainly depend on high-RDW level, rather than significant differences on more important variables detailed above?

Another randomization error involves the number of two groups (168 vs 29 patients). The authors also did not discuss this situation in the limitations. This impropriety may seriously decrease the statistically significance.

The authors also declared that high RDW values have positive correlation with 30-day procedure-related major adverse events, especially in vascular complications and paravalvular aortic regurgitation. This is really interesting, because paravalvular aortic regurgitation mainly depends on the procedural success [2–4] rather than on a simple blood parameter. We could not find any subgroup analysis in the study about paravalvular regurgitation. Did the authors really randomize the patients homogenously in terms of surgical success for this conclusion?

Although the authors state that the cut-off value of RDW was defined according to the study of Aung et al. [5], is it really true that the cut-off value of RDW was 15.5% in their laboratories? And could it be a universal cut-off value for RDW worldwide? How did they calibrate their laboratories with the previous study? We consider that the exact cut-off value may alter in laboratories, so the randomization of these two groups is controversial. Furthermore, if the patients’ RDW level alters after the procedure, does the risk group of these patients change or do the risk group and the predictive value of RDW stay the same?

As a conclusion, we consider that patients’ demographic variables are the basic independent factors for post-procedural complications and survival, rather than RDW. There is need for more realistic and well-randomized studies with a larger patient population to support the authors’ hypothesis.

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Red cell distribution width may not have a good prospective predictive value in patients with transcatheter aortic valve implantation

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We thank Kadan et al. for their interest in our study ‘Red cell distribution width improves the prediction of prognosis after transcatheter aortic valve...