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Atrial electromechanical coupling parameters after transcatheter aortic valve replacement

Mehmet Dogan[1*], Omer Yiginer[2], Fatih Ozcelik[3], Alptug Tokatli[4]

[1]*Department of Cardiology, Ankara Mevki Military Hospital, Turkey*
[2]*Department of Cardiology, Gulhane Military Medical Academy, Haydarpasa Training Hospital, Turkey*
[3]*Department of Biochemistry, Gulhane Military Medical Academy, Haydarpasa Training Hospital, Turkey*
[4] *Department of Cardiology, Golcuk Military Hospital, Turkey*

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The article entitled *Effect of transcatheter aortic valve replacement on P-wave duration, P-wave dispersion and left atrial size* by Dursun, *et al*.[1] has contributed to our knowledge regarding the positive effects of transcatheter aortic valve replacement (TAVR) procedure on atrial electrical remodeling. In this study, TAVR procedure led to a decrease on P-wave duration and P-wave dispersion.

As expected, severe aortic valve stenosis causes to left ventricular remodeling due to chronic pressure load, so TAVR helps myocardium to regain its homogeneity. This happens by reduced after load, improvements in myocardial strain and thus left heart functions.[2,3] Previous studies have shown that, TAVR procedure had some positive effects on ventricular heterogeneity.[4,5] QT dispersion was reduced after TAVR and ventricular myocardium was supposed to be more homogenous. As a natural result, atrial structure and function are expected to be improved after TAVR. In this respect, the study by Dursun, *et al*.[1] presented an improvement in P-wave duration and P-wave dispersion after TAVR procedure.[1] However, we have some concerns about methodological perspective. First of all, the authors have measured the P-wave duration and P-wave dispersion manually. It would have been better if the authors had transferred ECG recordings to the digital platform in order to obtain more accurate data. Moreover, P-wave duration and P-wave dispersion have some technical problems in the measurements, especially with high rates of intra- and inter-observer variabilities.[6] As a relatively new tool to evaluate the electrical heterogeneity of the atria, atrial electromechanical coupling (EMC) parameters may be measured using echocardiography. Increased EMC parameters have been found to be related with the existence of atrial fibrillation.[7,8]

In order to measure atrial EMC parameters, tissue Doppler sample volume is placed to the left side of the left atrium, to the right side of the right atrium and to the interventricular septum at the level of atrioventricular annulus consecutively. The time interval from the onset of P-wave on ECG to the beginning of the late diastolic wave is defined as the PA intervals. The differences between the PA values are defined as electromechanical delays. Increases in atrial EMC intervals may indicate an inhomogeneous propagation of sinus impulses to the different sites of the atria and thereby increased risk for atrial arrhythmia.[8]

In conclusion, we believe that adding atrial EMC parameters to this study data would strengthen the findings of this valuable article.

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Correspondence to: mehmetdoganmd@yahoo.com

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Authors' reply

Huseyin Dursun[1], Zulkif Tanriverdi[2], Tugce Colluoglu[1], Dayimi Kaya[1]

[1]*Department of Cardiology, Faculty of Medicine, Dokuz Eylul University, Izmir, Turkey. E-mail: drhuseyindursun@gmail.com (Dursun H)*
[2]*Clinic of Cardiology, Idil State Hospital, Sirnak, Turkey*

We would like to thank Dogan, *et al*. for their valuable comments. We agree with the authors' suggestion of transferring the ECG recordings to the digital platform rather than manual calculation. Using a high resolution ECG instead of standard 12-lead ECG, which we had already mentioned in the limitations of our study, would have been also better for data analyses and would probably help to decrease the intra- and inter-observer variability.

The authors also suggested adding atrial EMC parameters measured by echocardiography in our study. Since increased EMC parameters were found to be related with the increased risk of atrial fibrillation,[1,2] we expect to find increased EMC parameters in patients with aortic stenosis (AS) and reduction of these values after transcatheter aortic valve replacement (TAVR). However there is no study so far evaluating EMC parameters in patients with AS. In our retrospective study we could not use these parameters because we did not measure any of them before TAVR. Thus we think comparison of EMC parameters firstly between healthy controls and patients with AS and then evaluation of the effect of TAVR on these parameters will be the subject of a new prospective study.

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