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Conference Abstract

P.49 Aortic Root Longitudinal Strain by Speckle-Tracking Echocardiography: Comparison with Cardiac Magnetic Resonance and Predictive Value in Marfan Syndrome Patients

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Keywords

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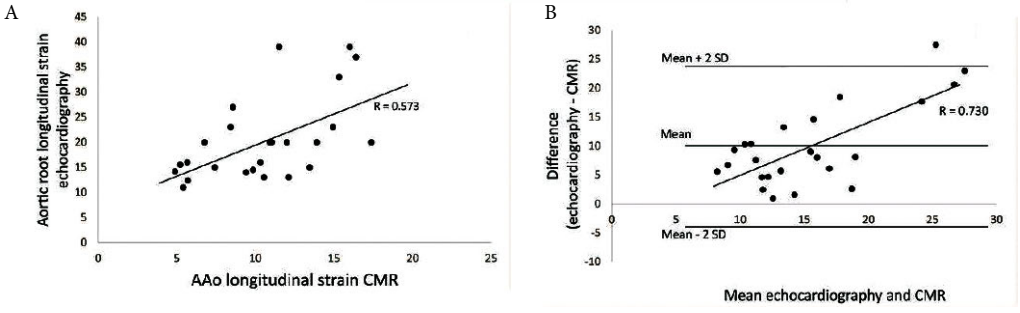
ABSTRACT

Background: Low longitudinal strain of the ascending aorta (AAo) by cardiac magnetic resonance (CMR) predicts dilation and aortic events in Marfan syndrome (MFS) [1], possibly reflecting aortic stiffness [2]. Speckle-tracking is established for cardiac deformation, but proximal aorta applications are challenging due to wall thickness and substantial motion. We aimed to validate a purpose-specific speckle-tracking tool for root longitudinal strain analysis by comparison with CMR-derived AAo longitudinal strain and as predictor of dilation in MFS patients.

Methods: CMR feature-tracking [1] and echocardiography speckle-tracking where applied to 25 MFS patients free from previous aortic surgery by a single observer blind to clinical data. For echocardiography, two regions of interests were manually created covering both walls in a parasternal long-axis view and tracked along the cardiac cycle. Longitudinal strain was computed as the average of maximum increase in relative distance of several sub-regions covering both walls. Aortic diameter was measured on CMR images.

Results: Both techniques were successfully applied to all patients. Aortic root longitudinal strain by echocardiography was linearly related to CMR-derived AAo longitudinal strain (R = 0.573, p = 0.003, Figure A) and was higher (20.4 ± 8.4 vs 10.5 ± 3.8), especially at higher absolute values (Figure B). After a mean follow up of 45 ± 13 months, aortic root diameter growth rate was 0.27 ± 0.3 mm/year. In multivariable analysis corrected for root diameter and heart rate (p = 0.083 and 0.005, respectively), baseline longitudinal strain by echocardiography was independently related to progressive dilation (B = −0.017, p = 0.005).

Conclusion: Aortic root longitudinal strain by echocardiography is related to CMR-derived AAo longitudinal strain and is an independent predictor of progressive dilation in MFS patients.



Figure

REFERENCES

[1] Guala A, Teixido-tura G, Rodriguez-Palomares JF, Ruiz-Muñoz A, Dux-Santoy L, Villalva N, et al. Proximal aorta longitudinal strain predicts aortic root dilation rate and aortic events in Marfan syndrome. Eur Heart J 2019;1–9.

[2] Guala A, Rodriguez-Palomares JF, Dux-Santoy L, Teixido-Tura G, Maldonado G, Galian L, et al. Influence of aortic dilation on the regional aortic stiffness of bicuspid aortic valve assessed by 4-dimensional flow cardiac magnetic resonance: comparison with Marfan syndrome and degenerative aortic aneurysm. JACC Cardiovasc Imaging 2019;12:1020–9.

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