The goal: Three-dimensional (3D) speckle tracking echocardiography (STE) could encompass the benefits of STE and 3D echocardiography allowing to see the heart as it is: a 3D organ. In the recent studies, alterations in ventricular deformations could be demonstrated in adult patients with corrected tetralogy of Fallot (cTOF) by 3DSTE. The present study was designed to assess 3DSTE-derived right atrial (RA) volumetric and strain parameters in cTOF.

Patients and Methods: A total of 17 cTOF patients were involved into the present study. Their results were compared to 18 age- and gender-matched healthy controls. All subjects have undergone complete 2-dimensional Doppler echocardiographic and 3DSTE measurements.

Results: Significantly increased RA volumes respecting heart cycle could be detected in cTOF patients. Total and passive atrial emptying fractions proved to be significantly decreased in patients with cTOF (26.4 ± 12.4% vs. 39.1 ± 8.8%, p=0.001 and 11.2 ± 6.8% vs. 19.8 ± 9.0%, p=0.003, respectively). Global and mean segmental peak longitudinal (17.0 ± 10.9% vs. 30.8 ± 11.2%, p=0.0008 and 20.6 ± 10.7% vs. 34.4 ± 10.5%, p=0.0005) and area strains (20.2 ± 18.8% vs. 41.0 ± 19.8%, p=0.003 and 28.1 ± 19.8% vs. 49.1 ± 19.7%, p=0.004) and global radial peak strain (9.5 ± 5.6% vs. 15.0 ± 10.0%, p=0.05) proved to be reduced in cTOF patients as compared to controls. Global pre-atrial contraction circumferential strain was significantly decreased in cTOF patients (3.9 ± 6.9% vs. 10.8 ± 11.0%, p=0.03).

Conclusions: Complex evaluation of RA dysfunction could be allowed by 3DSTE including volumetric and strain analysis.

KEYWORDS: three-dimensional, speckle-tracking, echocardiography, right atrium, tetralogy of Fallot.

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