Three-dimensional imaging of anomalous origin of the right coronary artery in a young athlete

Luigi P. Badano1*, Denisa Muraru1, Roxana Onut2, Chiara Lestuzzi3, and Francesco Toso4

1Department of Cardiology, Vascular and Thoracic sciences, University of Padua, Via Giustiniani 2, 35100 Padua, Italy; 2Department of Cardiology, Clinical Emergency Hospital, Bucharest, Romania; 3Cardiology Service, Centro di Riferimento Oncologico, Aviano, Italy; and 4Department of Radiology Sciences, University Hospital ‘S Maria della Misericordia’, Udine, Italy

* Corresponding author. Tel: +39 049 8211844, Fax: +39 049 8761764, Email: lpbadano@gmail.com

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We present a case of a 14-year-old male athlete to demonstrate the potential usefulness of three-dimensional echocardiography in supplementing magnetic resonance angiography in the assessment of actual anatomy in patients with anomalous origin of right coronary artery.

Anomalous origin of the right coronary artery (RCA) from the left Valsalva sinus with an interarterial course between the great arteries is a rare congenital anomaly that may be associated with myocardial ischaemia and sudden cardiac death, particularly in young people and athletes. We present a case of a 14-year-old male athlete who was asymptomatic, with no family history of juvenile sudden death. During pre-participation medical examination for a competition, his resting electrocardiogram showed 0.5 mm ST-elevation and inverted small T-waves in V1–V3 leads. Routine two-dimensional transthoracic echocardiography (DTE) failed to identify the ostium of coronary arteries. Whole-heart coronary magnetic resonance angiography (MRA) and a three-dimensional DTE (3DTE) were performed in this setting.

MRA volume rendering image (panel A) shows RCA (arrow) arising from the left sinus of Valsalva and coursing between the ascending aorta and the pulmonary artery. Curved multi-planar reformatted image (panel B) shows the acute take-off angle of the RCA (arrow) from the aorta, while its separate or common origin from the left main coronary artery remained unclear. Three-dimensional DTE-rendered sagittal and transverse views of the aortic root (panels C and D) enabled us to show that the two separate ostia of both RCA and left main coronary artery are clearly visualized.

This case with excellent quality of the echo images, obtained in a young patient with thin chest wall and athletic body habitus, demonstrates the potential usefulness of 3DTE in supplementing MRA in the assessment of actual anatomy in patients with anomalous origin of RCA.

Supplementary material
Supplementary data are available at European Journal of Echocardiography online.

Conflict of interest: none declared.