Exercise Deconditioning in Hypertrophic Cardiomyopathy

Desacondicionamiento deportivo en la miocardiopatía hipertrófica

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We report the clinical case of a 39-year-old male patient, a high-performance athlete without cardiovascular risk factors, history of heart disease or family history of sudden death. A control color Doppler echocardiography revealed hypertrophic cardiomyopathy (HCM). A cardiac magnetic resonance imaging was performed to complete his study and determine the presence of delayed gadolinium enhancement (DE). The cine sequences showed hypertrophy of the interventricular septum with a maximum thickness of 15.2 mm (Figure 1A), without evidence of myocardial contrast delayed enhancement (Figure 2) or increased intraventricular gradients. Exercise deconditioning and beta blockers were recommended.

Another cardiac magnetic resonance imaging was performed two months later, which showed minimum reduction of medial septal thickness (Figure 1B), with no significant changes in the rest of the segments. It was decided to follow the same treatment; a cardiac magnetic resonance imaging performed six months later showed an important reduction of wall thickenings, with a maximum wall thickness of 10.8 mm (Figure 1C). Again, no increased gradients or evident DE were observed.

Hypertrophic cardiomyopathy is the leading cause of sudden death in young adult athletes. (1) However, the information is currently controversial as to the type of recommended pre-competitive assessment. In Europe, routine pre-competition checkup includes medical record, physical exam, and a 12-lead-resting electrocardiogram (ECG) (2) Abnormal findings lead to a second level, in which the echocardiogram is generally the first test. In turn, American medical publications suggest and remark the importance of performing correct and complete anamnesis and physical exam, since it is believed that performing ECGs in all pre-competition checkups would not be cost-effective given the high rate of false positives and the low prevalence of sudden death in sports. They thus reserve more complex tests (ECG, echocardiogram) only for professional athletes, since the institutions involved would have the means to perform them.

According to the 2013 Consensus on Noninvasive Cardiovascular Imaging of the Argentine Society of Cardiology, the use of magnetic resonance imaging in HCM presents a Class I indication in patients with clinical suspicion and non-conclusive echocardiogram, and a Class IIa indication (reasonable to use it) in patients with confirmed diagnosis for risk stratification. Magnetic resonance imaging allows more accurate measurement of myocardial thickness in all cardiac segments than echocardiography, and the detection of myocardial fibrosis through DE sequences, which have an independent prognostic value to predict arrhythmia and death. (3-5) It therefore provides a correct assessment of the apical and right ventricular segments, which are sometimes difficult to assess with Doppler echocardiography. In the same line, the detection of DE rules out athlete hypertrophy in patients evidencing DE. In the present case, HCM was excluded due to the evident wall thickness normalization with exercise deconditioning, together with the absence of fibrosis in DE sequences.

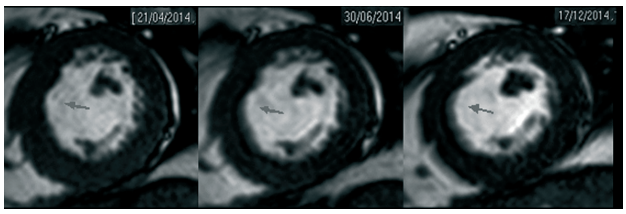

Fig. 1. Cine sequences in the same left ventricular short axis. A. April 2014, hypertrophy of the interventricular septum with 15.2 mm thickness (arrow). B. June 2014, minimum reduction of the interventricular septal diameter (arrow). C. December 2014, thickness normalization is observed, currently 10.8 mm (arrow).

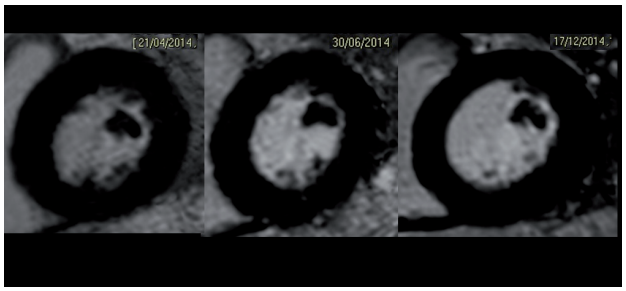

Fig. 2. T1-weighted inversion-recovery sequences (contrast delayed enhancement), performed 7-8 minutes post-gadolinium injection in the same left ventricular short axis.

Conflicts of interest

None declared (See authors' conflicts of interest forms in the website/ Supplementary Material).

REFERENCES

1. Maron BJ, Thompson PD, Puffer JC, McGrew CA, Strong WB, Douglas PS, et al. Cardiovascular preparticipation screening of competitive athletes. A statement for health professionals from the Sudden Death Committee (clinical cardiology) and Congenital Cardiac Defects Committee (cardiovascular disease in the young), American Heart Association. Circulation 1996;94:850-6. http://doi.org/bdmq

2. Corrado D, Schmied C, Basso C, Borjesson M, Schiavon M, Pelliccia A, et al. Risk of sports: do we need a pre-participation screening for competitive and leisure athletes? Eur Heart J 2011;32:934-44. http://doi.org/dmrsjn

3. Maron MS, Maron BJ, Harrigan C, Buros J, Gibson CM, Olivotto I, et al. Hypertrophic cardiomyopathy phenotype revisited after 50 years with cardiovascular magnetic resonance. J Am Coll Cardiol 2009;54:220-8. http://doi.org/bwpntd

4. Shirani J, Pick R, Roberts WC, Maron BJ. Morphology and significance of the left ventricular collagen network in young patients with hypertrophic cardiomyopathy and sudden cardiac death. J Am Coll Cardiol 2000;35:36-44. http://doi.org/d5d64x

5. Varnava AM, Elliott PM, Baboonian C, Davison F, Davies MJ, McKenna WJ. Hypertrophic cardiomyopathy: histopathological features of sudden death in cardiac troponin T disease. Circulation 2001;104:1380-4. http://doi.org/bwcvcf

REV ARGENT CARDIOL 2016;84:355. http://dx.doi.org/10.7775/rac.v84.i4.7881

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