Incidental echocardiographic finding of non-obstructive cor triatriatum in a healthy triathlete

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Abstract

Introduction
The literature reports very few cases of cor triatriatum in the general population and very rare cases of cor triatriatum in competitive athletes.

Case report
This case report illustrates an original case, which concerns a middle-aged triathlete with no history of cardiac disease, but one who was found suffering from non-obstructive cor triatriatum sinister that was discovered incidentally by two-dimensional trans-thoracic echocardiography examination. The diagnosis required subsequent investigation with cardiovascular magnetic resonance imaging. This case report raises questions and sheds light on the obvious implications of this finding in cardiology and sports medicine.

Conclusion
As it is widely known, cor triatriatum has been incidentally diagnosed in asymptomatic adults; however, this case demonstrates that the presence of this rare congenital heart defect can be absolutely compatible with excellent physical performance, taking into account that the particular anatomy of this congenital heart malformation does not create any functional limitations in the cardiorespiratory system.

Introduction
The aim of this case report was to present an incidental echocardiographic finding of non-obstructive cor triatriatum in a healthy triathlete.

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Case report
A 43-year-old man, who was an elite triathlete, was referred to our sports medical centre for pre-participation screening and abilitation in the triathlon competition. This athlete has been active in racing triathlon and long distance cycling competitions for the last 10 years. His family history revealed no known congenital or other cardiovascular disease and no known causes of premature sudden cardiac death among close relatives. He had no relevant past medical history and physical examination was unremarkable. Peripheral blood pressure was 110/70 mmHg. Resting 12-lead electrocardiogram showed a sinus bradycardia and incomplete right bundle block. The cycloergometre and treadmill maximal exercise test showed a good performance and absence of any electrocardiographic abnormality, with a peak cycling workload of 330 watt, 15 METS on the treadmill Astrand protocol and a maximal heart rate of 165–170 bpm. Two-dimensional trans-thoracic echocardiogram demonstrated a left atrium divided into two compartments by an incomplete membrane appearing in an incomplete thin diaphragm in all echocardiographic windows (Figures 1, 2 and 3). The mitral valve appeared slightly dysplastic with mild regurgitation. Pulmonary artery pressure was estimated to be 25 mmHg. Hence, the filling pressure was not elevated and the athlete was asymptomatic. Suspected diagnosis of non-obstructive cor triatriatum sinister was performed. Subsequently, a two-dimensional echocardiogram that was performed by an expert echocardiographer and a cardiovascular magnetic resonance imaging (Figure 4) that was performed using a steady-state free precession sequence, clearly depicted the non-obstructive thin membrane within the left atrium. No other anomalies, were found particularly concerning the relationship between the left atrium and pulmonary vein and other associated common defects. Conse-

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Conclusion
This case demonstrates the increas-ingly frequent presence of adults with congenital heart disease that is compatible with competitive sports and signifies the importance of sports pre-participation screening. Adult cases of congenital heart disease (grown-up congenital heart [GUCH] disease), although rare, are mainly found through echocardiographic examinations. Also, the advent of the widespread use of cardiovascular imaging in the evaluation of cardiac disease may explain the rise in the frequency of cor triatriatum diagnosis. It follows that the open questions for further research are: (1) should echocardiography be consid-ered as a second-level examination or should it be routinely performed in sports pre-participation screening?; (2) what further assessments must be conducted in this athlete?; and (3) should GUCH (an adult born with congenital heart disease) with no apparent signs of functional impair-

In the paediatric population, this anomaly may be associated with major congenital cardiac lesions such as tetralogy of Fallot, double outlet right ventricle, coarctation of the aorta, partial anomalous pulmonary venous connection, persistent left superior vena cava with unoed coronary sinus, ventricular septal defect, atrioventricular septal (endocar-dial cushion) defect and common atrioventricular canal. Rarely, asplenia or polysplenia have been reported in these patients. In adult cases, cor triatriatum is frequently an isolated finding. In adults, cor triatriatum sinister can be characterised as follows: (1) asymptomatic (found incidentally on cardiac imaging), (2) an isolated finding with a large, non-restrictive communication between the superior and inferior left atrial chambers or (3) associated with minor congenital defects such as patent foramen ovale, atrial septal defect or persistent left superior vena cava.

Discussion

First reported in 1868, cor triatriatum, which is a heart with three atria (triatrial heart), is a congenital anomaly in which the left atrium (cor triatriatum sinister) or right atrium (cor triatriatum dexter) is divided into two compartments by a fold of tissue, a membrane or a fibro muscular band. Classically, the proximal (upper or superior) portion of the corresponding atrium receives venous blood, whereas the distal (lower or inferior) portion is in contact with the atrioventricular valve and contains the atrial appendage and the true atrial septum that bears the fossa ovalis. The membrane that separates the atrium into two parts varies significantly in size and shape. It may appear similar to a diaphragm or maybe funnel-shaped, band-like, entirely intact (imperforate) or may contain one or more openings (fenestrations) ranging from a small, restrictive-type to a large and widely open type. Cor triatriatum (sinister or dexter) is a congenital heart defect characterised by a fibro muscular membrane that divides the left atrium into two distinct chambers. The embryoge-netic and embryologic basis of this congenital heart defect remains controversi-al. In almost all cases, it is diagnosed in childhood and adult cases are extremely rare. The symp-tomatology depends on the type and degree of obstruction that mimics mitral stenosis. The membrane may be complete or may contain one or more fenestrations of varying size. It can be treated surgically by removing the membrane dividing the atrium.

Figure 4: Cardiovascular magnetic resonance imaging findings.
ment be a contraindication for competitive sports eligibility? We are, therefore, waiting for your answers.

Abbreviations list
GUCH, grown-up congenital heart.

Consent
Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

References

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