Congenital left ventricular diverticulum: Multimodality imaging evaluation and literature review

Andrea Romagnoli [a], Aurora Ricci [a], Daniele Morosetti [a,*], Armando Fusco [a], Daniele Citraro [a], Giovanni Simonetti [a]

[a] University Hospital "Tor Vergata", Department of Diagnostic Imaging, Molecular Imaging, Interventional Radiology and Radiation Therapy, Viale Oxford 81, 00133 Roma

[a] Italy

Congenital ventricular diverticulum is a rare cardiac malformation. We present the case of a 57-year-old man who underwent cardiac catheterization for suspected unstable angina. No coronary artery disease was diagnosed and a left ventricular diverticulum was incidentally found. Coronary CT and cardiac MRI were performed in order to confirm the diagnosis of a muscular type diverticulum and to exclude a post-ischemic aneurysm.

Keywords: Congenital left ventricle diverticulum, Left ventricular catheterization, Coronary CT, Cardiac MRI

Introduction

Congenital ventricular diverticulum is a rare cardiac malformation, usually diagnosed on routine echocardiography examinations. The increasing use of non invasive techniques such as CT and MRI can help in the evaluation of the myocardial morphology, contraction of the wall and its assessment, and in order to rule out differential diagnoses. We report a case of a patient with incidental finding of left ventricular diverticulum, which was evaluated with various diagnostic imaging methods in order to obtain all data necessary to perform a correct diagnosis.

Informed consent was obtained from the patient before performing each diagnostic examination.

Case report

A 57-year-old male with a localized precordial pain was referred to our cardiology unit.

His clinical history reported repeated episodes of angina-like chest pain symptoms in the recent period, and a significant familiar history of coronary artery disease. Other risk factors for cardiovascular accidents included: metabolic syndrome, smoking habit, and chronic administration of non-steroidal anti-inflammatory drugs due to rheumatoid arthritis. Electrocardiogram

Disclosures: Authors have nothing to disclose with regard to commercial support.

Received 24 April 2014; revised 24 June 2014; accepted 18 July 2014. Available online 25 July 2014

* Corresponding author. Tel.: +39 06 20902400/01.
E-mail address: danielemorosetti@hotmail.com (D. Morosetti).

P.O. Box 2925 Riyadh – 11461KSA
Tel: +966 1 2520088 ext 40151
Fax: +966 1 2520718
Email: sha@sha.org.sa
URL: www.sha.org.sa

1016–7315 © 2014 Production and hosting by Elsevier B.V. on behalf of King Saud University.

Peer review under responsibility of King Saud University.
URL: www.ksu.edu.sa
http://dx.doi.org/10.1016/j.jsha.2014.07.004

Production and hosting by Elsevier

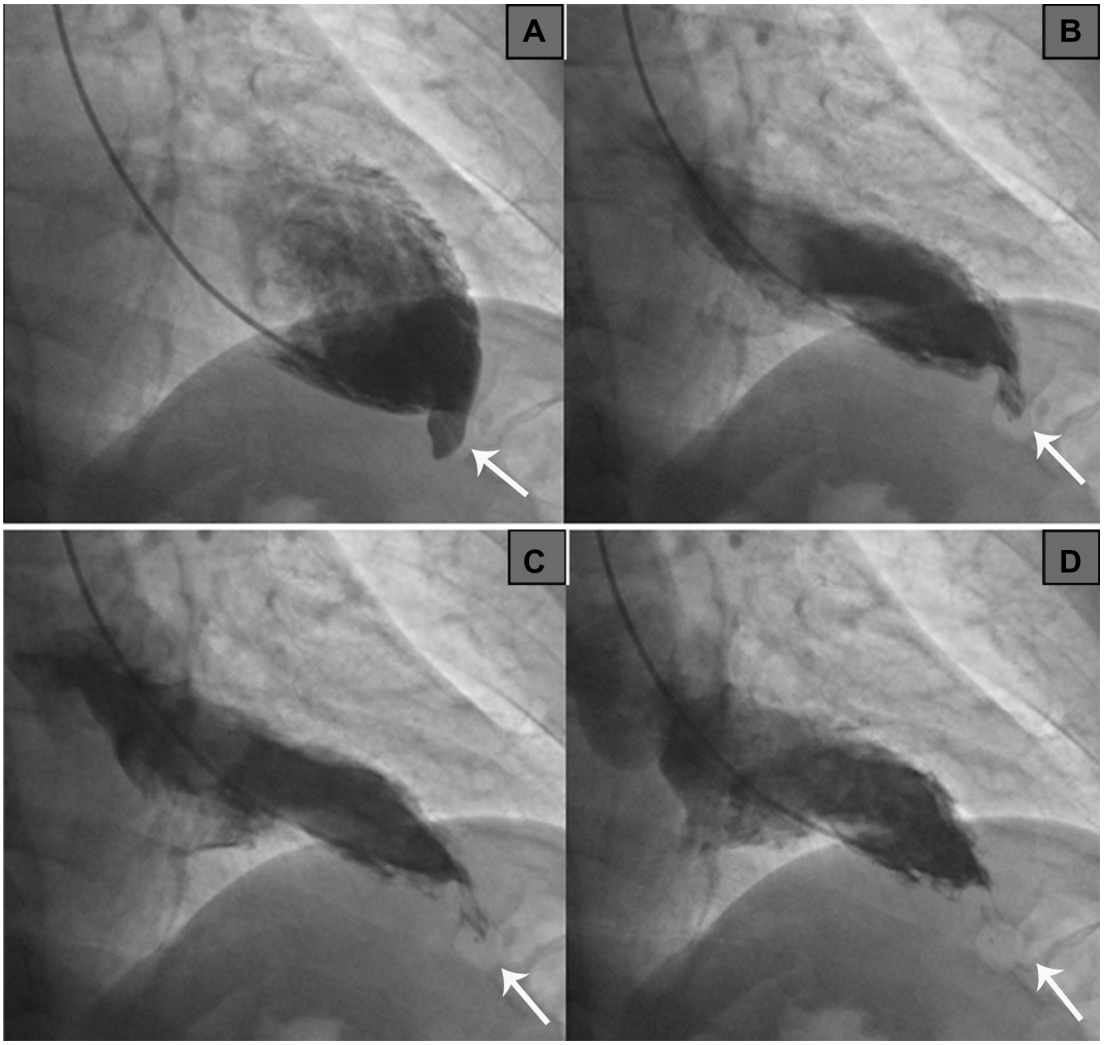

Figure 1. A 57-year-old male with congenital left ventricular diverticulum. Left ventriculogram obtained in 30° right anterior oblique projection shows an elongated contrast filled outpouching in end-diastolic phase (A), with complete emptying during the systolic phase (B–D), arising from the left ventricular apex (white arrows). This was indicative of cardiac diverticulum.

(ECG), echocardiographic evaluation, and myocardial creatine kinase value level were normal. However, due to clinical suspicion of unstable angina, a coronary angiography was performed as suggested by the cardiologist. Conventional coronary angiography was performed using an Innova 2100 angiographer with multiple projections (General Electric Medical System, Milwaukee, WI, USA). No stenoses were detected, but a subsequent ventriculography, obtained in 30° right anterior oblique (RAO) projection, revealed a wall appendix characterized by rapid contrast media filling in diastole (Fig. 1A), contracting in synchrony with the ventricle wall (Fig. 1B–D), a narrow neck and no thrombosis in the lumen. Due to its features, the diagnosis of left ventricular congenital diverticulum was hypothesized.

The patient underwent a coronary CT to exclude the possible post-ischemic nature of the wall appendix. The examination was performed using a 64-slice scanner (LightSpeed VCT, General Electric Medical System, Milwaukee, WI, USA) with a retrospective synchronization technique. A dose of 80 ml of non-ionic iodinated contrast medium and 40 ml of saline solution were administered at a rate of 5 ml/s. Parameters for the contrast-enhanced scan were set as follows: beam collimation 64×0.625 mm; slice thickness 0.625 mm; reconstruction increment 0.625 mm; table feed 2.9 mm/rotation; tube rotation 0.35 s; tube voltage 120 kV; intensity 400–650 mA (automatic dose modulation); D-FOV 25 cm; and S-FOV cardiac small, cranium-caudal scan direction. Scan duration was 5.5 s. Image reconstruction was obtained using multiple temporal windows from 40% to