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Exercise-induced myocardial ischaemia on scintigraphy despite β -blocker therapy in patients with an anomalous origin of the right coronary artery coursing between the aorta and pulmonary artery

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DESCRIPTION

In February 2012, a 60-year-old man presented to us with a positive exercise test for ST-depression, which was performed before beginning sports activity. Rest/stress thallium-201 single-photon emission cardiac tomography (SPECT) revealed inferior and lateral wall reversible defects (ischaemia) and a painless ST-depression at peak during a bicycle maximal exercise test. Cardiac tomography (CT) documented an anomalous origin of the right coronary artery (ARCA) arising from the left sinus of Valsalva with an extramural course between the aorta and the pulmonary artery (figure 1). The aetiology of myocardial ischaemia in ARCA is multifactorial and is caused by the transient coronary flow reduction elicited by the systolic compression of the ARCA that is produced by the

great arteries at peak exercise.¹ The ARCA stenosis was about 40% on CT as confirmed by the invasive angiogram. The SPECT results suggested, however, the presence of a dynamic stenosis. The patient was treated with 200 mg of metoprolol daily for 2 months, and rest/stress thallium-201 SPECT was then repeated with the same techniques. Metoprolol reduced the myocardial oxygen consumption, which was indirectly measured by the peak exercise double product, but the ischaemic burden on SPECT did not change significantly from the basal values (figure 2). A failure to reduce the ARCA proximal systolic compression after β -blocker treatment may result in myocardial ischaemia,² and, thus, in increased vulnerability to life-threatening arrhythmias, myocardial infarction and sudden death during daily activities. Surgical management is usually recommended in patients with symptoms or exercise-induced myocardial ischaemia.³

Figure 1 Volume-rendered CT images indicates extramural anomalous origin of the right coronary artery with interarterial course between the aortic root (Ao) and the pulmonary artery (PA); right coronary artery (RCA) reduced calibre. Left anterior descending coronary artery (LAD).

Learning points

- ▶ Myocardial ischaemia may be caused by anomalous origin of the right coronary artery with interarterial course.
- ▶ Cardiac CT has been established as an excellent non-invasive test to identify and classify congenital coronary anomalies.
- ▶ Rest/stress single-photon emission cardiac tomography is a valid instrument to detect the efficacy of the medical treatment.

Competing interests None.

Patient consent Obtained.

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Figure 2 Stress (s) rest (r) thallium-201 single-photon emission cardiac tomography before (A) and after (B) therapy. Reversible perfusion defects, inferior (red arrows) and lateral (green arrows).

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