Images in cardiovascular medicine

Type IV dual left anterior descending coronary artery evaluated using multislice computed tomography: anatomy of a rare coronary anomaly

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(Received June 20, 2003; revision received October 15, 2003; accepted November 3, 2003.

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In the literature it is reported that coronary artery anomalies affect approximately 1% of the general population; a dual left anterior descending coronary artery (LAD) is a rare coronary anomaly consisting of two branches which supply the usual territory of the LAD. In the type IV dual LAD, according to Spindola-Franco et al., one branch is formed by the LAD proper (short LAD), whereas the second (long LAD) is unusual in its origin, from the right coronary artery. We describe a case of a 62-year-old male admitted to our University Hospital with a history of effort angina. Coronary angiography revealed a critical stenosis in the first segment of the right coronary artery, which was treated with a percutaneous coronary intervention and stent, and the presence of a dual LAD with a type IV pattern (Fig. 1). One month after coronary angiography the patient underwent multislice computed tomography (MSCT) evaluation, which is routinely performed in our Institute as a study protocol, to evaluate the stent patency. Our scanner (Light-Speed Plus, GE Medical System, Milwaukee, WI, USA) allows the acquisition of four slices per rotation with

Figure 1. A: coronary angiogram in the left anterior oblique projection showing the short left anterior descending coronary artery (LAD) (arrow) arising from the left main branch that terminates in its middle segment. B: three-dimensional volume rendering image from the multislice computed tomography examination showing the short LAD (small arrow) and the long LAD (large arrow) that courses parallel to the short LAD in the anterior interventricular groove reaching the apex. Two diagonal branches (*) arising from the short LAD and a marginal branch (M) are also displayed in the same image.
a 0.5 s rotation time; the technical parameters were as follows: slice thickness 1.25 mm, interslice gap 0.6 mm, tube current 325 mA with a tube voltage of 120 kV; the overall scan time was 31 s during a single breath-hold. We administered 120 ml of non-ionic contrast agent (Iomeron 350, Bracco, Milan, Italy) at a flow rate of 3.5 ml/s and the transit time was calculated by a previous injection of 20 ml at the same flow rate. The patient’s heart rate was 59 b/min and therefore no intravenous beta-blocker was used before MSCT. Images were reconstructed using retrospective electrocardiographic gating at different percentages of the R-R interval (from 30 to 90%, with a 10% increment step) and were transferred to an external workstation for postprocessing (Advantage Window 4.0, GE Medical System). MSCT showed in detail the origin, path and relationship between the two LAD and the main arterial vessels and myocardium (Fig. 2).

Specifically, the long LAD presented a partially intramyocardial course between the interventricular septum and the right ventricular outflow tract and then followed a normal course in the anterior interventricular groove to reach the apex, identifying a myocardial bridging. This report shows the potential usefulness of MSCT for the assessment of a normal as well abnormal anatomy of the coronary arteries that could be relevant for diagnostic and treatment purposes.

References