SINGLE LEFT CORONARY ARTERY WITH THE RIGHT CORONARY ARTERY ARISING FROM THE MID-PORTION OF THE LEFT ANTERIOR DESCENDING ARTERY. DIAGNOSIS WITH MDCT

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Single coronary artery is a very rare entity. We describe a very unusual subtype of this anomaly in which the right coronary artery arises from the mid-portion of the left anterior descending artery. MDCT allowed diagnosis of this non pathogenic variant and excluded any significant coronary stenosis.

Key-word: Coronary vessels, anormalities.

Single coronary artery without congenital cardiac defect is very rare, with a prevalence of 0.024 to 0.06% in the general population. We describe a very unusual subtype of this anomaly, in which the right coronary artery arises from the mid-portion of the left ascending artery (LAD). MDCT allowed diagnosis and excluded any significant coronary stenosis.

Case report

The patient is a 62 year-old male with atypical chest pain, a metabolic syndrome and family risk factors. A complete right bundle branch block did not allow stress test and a gated MDCT of the coronary arteries was performed. It showed no artery arising from the right sinus of Valsalva and a very large (7 mm wide) left main coronary artery originating from the left sinus of Valsalva (Fig. 1, 2, 3). There was a normal dominant circumflex artery and a small calcified non stenosing plaques on the proximal LAD (Fig. 2). The RCA (right coronary artery) arised from the mid-portion of the LAD (Fig. 2, 3), joining the right atrioventricular groove after a course in front of the pulmonary outflow tract at the level of the valve. No significant stenosis on any of the arteries was noted.

Fig 1. — MDCT with intravenous injection of non ionic iodinated contrast (iopromide with 370 mg of iodine/cc, injection rate 4 cc/sec, total bolus of 90 cc. CT acquisition parameters with were 100 kV, modulated mAs, with a finale dose of 10.19 CTD/vol of mGy, DLP 525 mGy-cm and 9 mSev. Volume rendering image: upper view showing the left main coronary artery (broad arrow) giving the CX and the LAD (curved arrow) wich gives the RCA (small arrows) that crosses to the right in front of the pulmonary outflow tract, not seen on this volume rendering image.
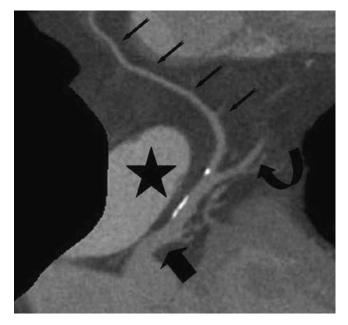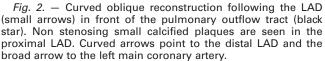
Discussion

As gated multidetector CT of the coronary arteries is being used more and more often to exclude stenosing disease in the coronary arteries, many variants are encountered. Some are incidental, some potentially serious when the artery passes between the aorta and pulmonary artery before reaching the other side or when there is an ectopic coronary origin from the pulmonary artery (1).

Single coronary artery without congenital cardiac defects is very rare, with an incidence of 0.024 to 0.06% in the general population. In a series of 125.596 patients undergoing coronarography, it was noted in 0.040% (1). The Lipton classification scheme (2) can be used to classify the anomalies. The anomalous coronary artery is first designated with "R" or "L" depending upon whether the ostium is located in the right or left sinus of Valsalva. Our patient has a LI type anomaly, with the main coronary artery arising on the left. Many L1 type patients just have a huge distal circumflex artery giving the distal RCA (3). A double supply of the RCA was also described (4),

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Fig. 2. — Curved oblique reconstruction following the LAD (small arrows) in front of the pulmonary outflow tract (black star). Non stenosing small calcified plaques are seen in the proximal LAD. Curved arrows point to the distal LAD and the broad arrow to the left main coronary artery.
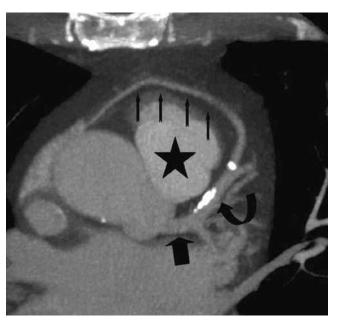

Fig. 3. — Oblique 4 mm thickness MIP slice (nearly axial) at the level of the left main coronary (broad arrow), showing the LAD (curved arrow) and the RCA (small arrows), which crosses to the right in front of the pulmonary outflow track (black star) in direction of the right atrioventricular groove.

from the distal CX and from a RCA arising from the LAD. Just a few cases of isolated supply from the mid-LAD, as in our patient, have been described, the first one in 1998 (5). As the vessel crosses in front of the pulmonary outflow tract and not between aorta and pulmonary artery, it can be considered a non toxic variant.

Conclusion

MDCT is a useful tool to exclude coronary stenosis in low to middle-risk patients. Congenital anomalies of the origin of the coronary are encountered in about 1%. It must be recognized and analyzed to differentiate dangerous from anecdotal variants as in this case.

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