
CORONARY ANOMALIES: CASE REPORTS AND LITERATURE REVIEW

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ABSTRACT

This was a retrospective, descriptive review and analysis of two cases of coronary anomalies to demonstrate the effectiveness of visualizing coronary anomalies using multislices, computed tomography (MSCT). Unique were: 1) An anomaly of the left circumflex coronary artery arising from the right anterior coronary sinus with an anomalous retro-aortic course. 2) The absence of the common left main coronary arterial trunk, with a split origin at the left anterior descending artery and the left circumflex coronary artery. The ramifications of this report is that coronary anomalies are well depicted using CT, helping to avoid iatrogenic events during coronary interventions.

Keywords: Coronary anomalies; Multislices spiral CT (MSCT); Coronary angiography

INTRODUCTION

The incidence of coronary anomalies in patients undergoing coronary angiography varies between 0.4 and 1.3%.¹⁻⁷ Many of these anomalies are clinically benign; however, others are associated with serious morbidity and may cause sudden death.⁸ Previous reports indicate that coronary anomalies are involved in 12% of sports-related sudden cardiac deaths vs. 1.2% of non-sports-related deaths.⁹⁻¹⁰ We report two coronary anomalies discovered by MSCT coronary angiography.

MATERIAL AND METHOD

Retrospective, descriptive reviews were performed on two cases of coronary anomalies examined by MSCT coronary angiography (using a Somatom 16 scanner) with a 420 ms gantry rotation. The studies were accomplished using retrospective ECG gating. A β -blocker was used to prepare the patients as the target heart rate was ≤ 60 beats per

minute. The scan protocol included a 0.75 mm collimation, 120 kV, 750 mAs, with 0.42 s rotations at an 8 s delay, a 1 mm slice thickness, a 0.5 mm distance and a B20f kernel.

The examination area covered the tracheal bifurcation down to the base of the heart while we conducted the preliminary coronary calcium score examination. An additional CT angiography (CTA) study was done with an intravenous contrast injection (110 mL) by which a 4 mL/s flow rate was determined. Image post-processing was done with a maximum intensity projection (MIP) and the reconstructed images included three different planes; similar to standard cardiac catheter projections (viz. the right anterior oblique RAO, the left anterior oblique LAO and the spider view). Additional surface-shaded display images (i.e. in space) were done to obtain more information on the coronary vessels.

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CASE REPORTS

We report on two German nationals in whom anomalies of their coronary vessels were discovered.

The first case was a 65-year-old male with an anomaly of the left circumflex coronary artery (LCX) arising from the right anterior coronary sinus with an anomalous retroaortic course (Figures 1-6). Spotty calcification of the LCX was evident.

The second case was of a 46-year-old male with a missing left main coronary arterial trunk, replaced by a split origin for both the left anterior descending artery (LAD) and LCX (Figures 7-9). Additional findings of spotty calcification of the LAD and long type calcification of the diagonal branch were observed (Figure 8)



Fig.1 Curved multiplanar reformation (MPR) image of the normal right coronary artery (RCA)



Fig.2 Curved MPR image shows the LCX arising from right coronary sinus



Fig.3 Curved MPR image shows retroaortic course of the LCX

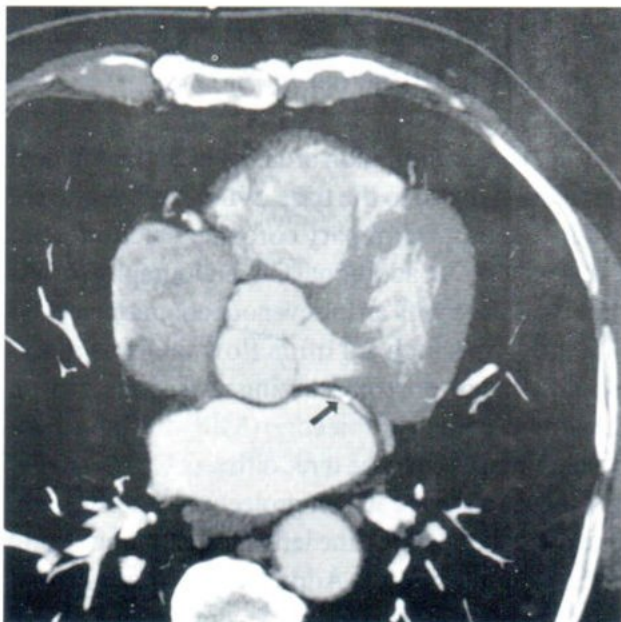


Fig.4 Axial MSCT image displays retro-aortic course of the LCX

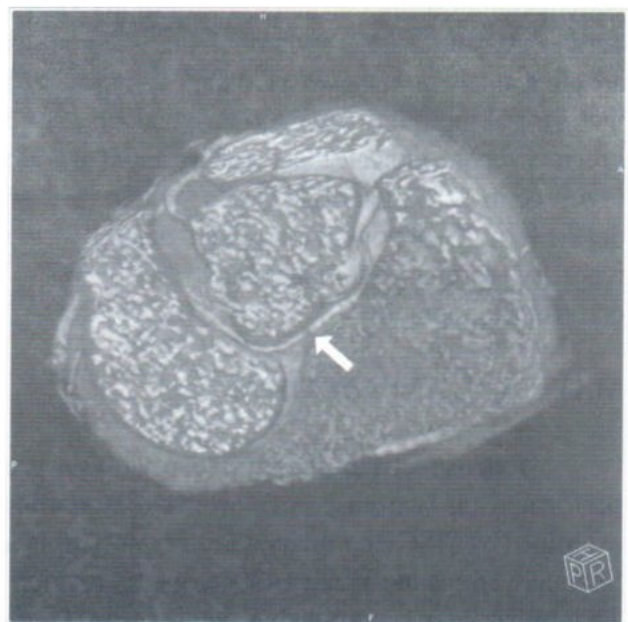


Fig.5 Shaded-surface 3D display of the heart and coronary artery depicts anomaly of the LCX arising from the right coronary sinus with retroaortic course

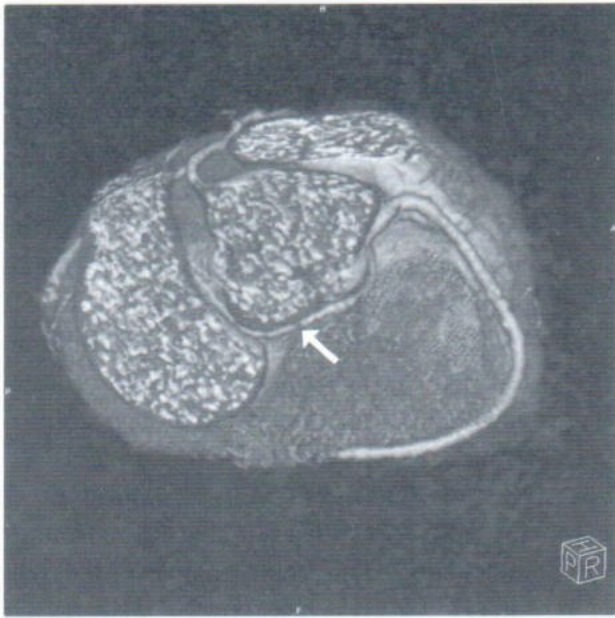


Fig.6 Shaded-surface display image shows retro-aortic course of the LCX

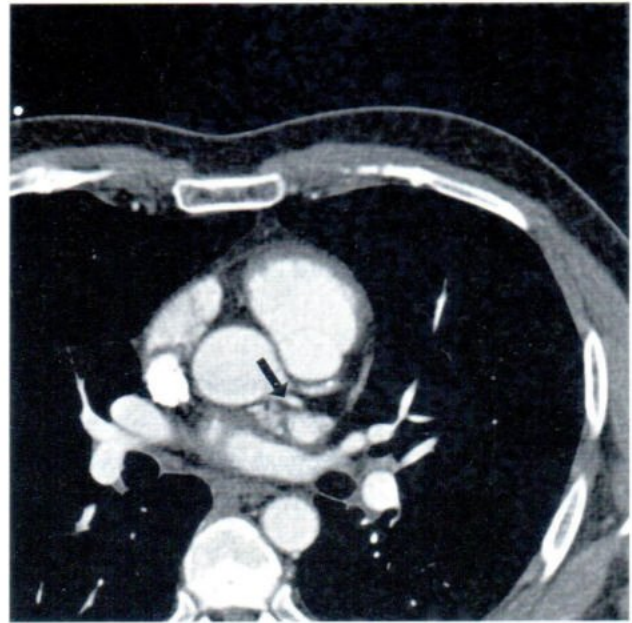


Fig.7 Axial MSCT image shows absent of left main coronary artery and split origin of the LAD and LCX

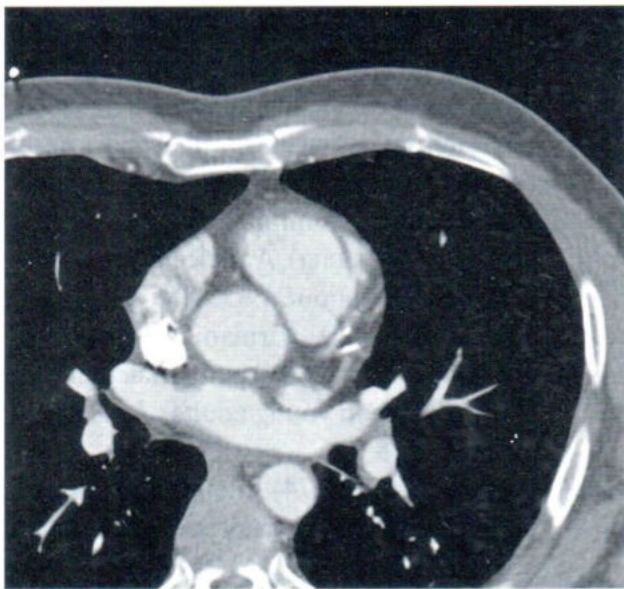


Fig.8 Axial MSCT image displays spotty calcification of the LAD and long type calcification of diagonal branch

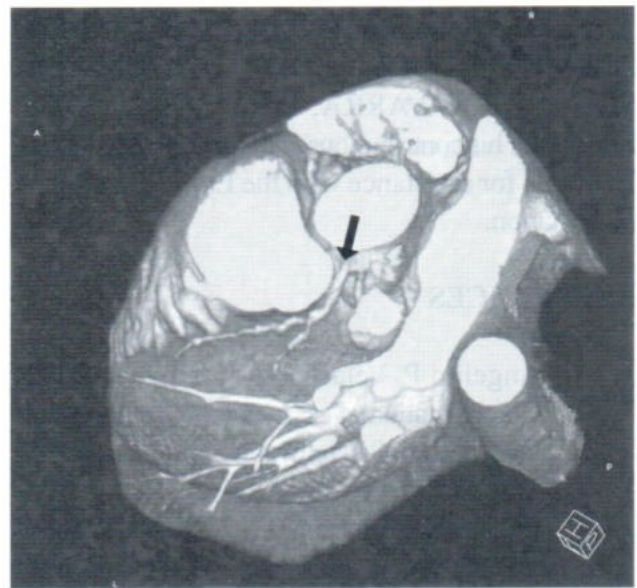


Fig.9 Shaded-surface 3D image demonstrates split origin of the LAD and LCX

DISCUSSION

In adults, congenital coronary anomalies are observed with a frequency of ~0.8%. Among these, the left circumflex coronary artery, originating from the right coronary sinus, comprises of more than half of the anomalies.¹¹ Some reports indicate a similar split-origin of the LAD and LCX constitutes about 35% of anomalies.⁶

Most patients with coronary anomalies are asymptomatic; however, some are associated with serious morbidity. Knowledgeable awareness of these variations is crucial during invasive catheterization or bypass surgery.

Coronary anomalies are well depicted by MSCT coronary angiography, so the modality is useful for avoiding iatrogenic events during coronary interventions.

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