

Chest Pain, Something is Not Right...Or Left

A 46-year-old female was referred for evaluation of central chest pain unrelated to exertion. She was known to have diabetes mellitus, hypertension, and dyslipidaemia. Physical examination, routine blood investigations, electrocardiogram and chest radiograph were unremarkable. Stress myocardial perfusion imaging demonstrated normal perfusion of the left ventricle (LV) with no ischaemia detected. However, because of her cardiovascular risk factor profile and recurrent episodes of chest pain, computed tomography coronary angiography (CTA) was performed to further evaluate the cause of chest pain (Figs. 1A, 1B and 1C).

What is the most likely diagnosis?

- Left anterior descending artery occlusion with collateralisation from right coronary artery
- Anomalous origin of left anterior descending artery from the right cusp
- Single coronary artery from the right and absent left anterior descending artery
- Right coronary artery fistula to the right ventricular outflow tract
- Myocardial bridging over the left anterior descending artery

Discussion

CTA revealed a solitary right coronary artery (RCA) giving rise to an anomalous obtuse marginal (OM) artery and a large diagonal branch to the lateral LV wall that continued to supply the apex (Figs. 1A and 1B). No left anterior descending (LAD) artery was visualised in the inter-ventricular groove (Fig. 1C). On the invasive coronary angiogram, there was no LAD or left circumflex (LCX) artery from the left coronary cusp either (Fig. 1F).

Single coronary artery (SCA) is an uncommon congenital anomaly. SCA with an absent LAD is even more rare, with only a few cases reported to have been detected by invasive coronary angiography, but not previously with CTA.^{1,2} Patients with SCA may be asymptomatic or present with acute coronary syndrome, syncope or sudden death. Concomitant atherosclerosis and ischaemia may be present, the mechanism of which is uncertain. Besides traditional risk factors, the lack of side branches and arterial bends has been postulated to decrease protection against atheroma formation; and endothelial dysfunction and coronary spasm have been implicated in ischaemia.³

In this middle-aged female, absence of significant

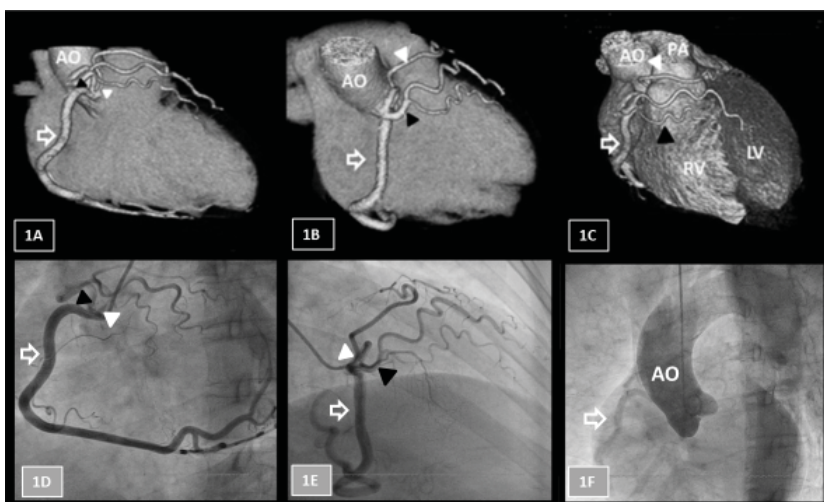


Fig. 1. Comparison between CT coronary angiogram and invasive coronary angiogram in the left anterior oblique (1A and 1D), right anterior oblique (1B and 1E), and straight anterior posterior (1C and 1F) views. Hollow white arrow: right coronary artery; Black triangle: anomalous obtuse marginal artery; White triangle: first diagonal branch to the lateral LV wall that continued to supply the apex; AO: aortic root; PA: pulmonary artery; LV: left ventricle, RV: right ventricle. No left anterior descending artery (LAD) was visualised in the inter-ventricular groove (1C). Aortogram highlighting the aortic root (AO) showed absence of both LAD and left circumflex artery from the left coronary cusp (1F).

Answer: C

myocardial ischaemia on myocardial perfusion imaging and luminal stenosis on coronary angiography (Figs. 1D and 1E) suggest that this singular coronary abnormality is likely to have been a fortuitous finding. The patient's chest pain resolved quickly with analgesics. She has since remained well after 6 years' follow-up.

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