Unusual case of intercoronary communication

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DESCRIPTION

A 53-year-old man with history of coronary artery disease (CAD) status after percutaneous coronary intervention of left anterior descending (LAD), diabetes mellitus type II and dyslipidaemia presented to our cardiology clinic with exertional, episodic chest pain and palpitations. His physical examination was normal with a blood pressure of 136/80 mm Hg and a regular heart rate of 76/min. He underwent stress test where his baseline ECG was normal but his stress ECG showed non-sustained ventricular tachycardia with myocardial perfusion imaging revealing a reversible defect involving the inferior wall. Coronary angiography showed patent stents in proximal and mid-LAD without any in-stent restenosis. There was no evidence of obstructive CAD in LAD and left circumflex artery (LCX)(figure 1A-B). However, he was noted to have a retrograde filling of the LCX from right coronary artery (RCA) (figure 2A-B). Previous angiography reports did not describe the retrograde filling. Since the distal end of the retrograde filling was not definitely visualised, it was decided to do simultaneous dual injections which revealed intercoronary communication (ICC) between the right posterolateral (RPL) and the LCX (figure 2B).

ICC is a rare congenital anomaly, involving anastomosis between two non-obstructed coronary arteries, which was first described in 1972.¹ The most common type of ICC is between RCA and LCX, as noted in our case.² These anomalies, also known as coronary arcade, are encountered in 0.05% of all the diagnostic coronary angiographies.^{3,4} In one study, the incidence was reported to be as low as 0.002%.⁵ The histological cross sections reveal well-defined muscular layer which resembles an epicardial coronary artery. ICC should be differed from coronary collaterals which are formed in the setting of obstructive CAD. The vessels involving the ICC are usually single, straight, extramural and larger in diameter (≥ 1 mm) as compared with coronary collaterals, which are multiple, non-terminal and smaller in diameter. Also, the histological sections of coronary collaterals reveal poorly

Figure 2 (A) ICC (orange arrow) arising from right coronary artery (blue arrow). (B) Simultaneous dual injection of left and right coronary arteries revealing bidirectional ICC (orange arrow) between the right coronary artery (blue arrow) and the left circumflex artery. ICC, intercoronary communication.

organised collagen and muscle fibres supporting endothelium. The functional significance of ICC depends on the direction of blood flow, which can be unidirectional or bidirectional with the ability to supply blood to the myocardium at risk in the setting of stenosis.⁶ On the contrary, these can be a cause of myocardial ischaemia due to coronary steal phenomenon. Owing to the larger diameter, they can also serve as a better guide during intervention of the occluded coronaries.⁷ We believe that ICC between the RPL and the LCX in our patient was of congenital origin given the distinctive angiographic features (single, straight and large diameter). As there was no significant obstructive CAD noted on the angiogram, the changes noted on stress ECG and myocardial perfusion imaging can be attributed to the coronary steal phenomenon from ICC, being induced in the situations of heightened stress.

Learning points

- ▶ The rare occurrence of intercoronary communication (ICC) is known in patients with and without coronary artery obstruction.
- ▶ Awareness of these rare channels, their possible locations and distinct morphology from collaterals will help cardiologists in making correct diagnosis and thus, needs to be reported to determine its true prevalence.
- ▶ Congenitally present ICCs should be differed from coronary collaterals. Smaller, multiple and non-terminal vessels should raise the suspicion for the latter.

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Figure 1 Left anterior descending (yellow arrow) and left circumflex artery (red arrow).

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