Bilateral origin of a split circumflex coronary artery

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DESCRIPTION

A 60-year-old man presented with exertional chest heaviness of 1 year duration. On evaluation, his ECG showed no significant abnormality to suggest previous ischaemia. He was subjected to coronary angiography. On selective coronary angiogram of the left coronary system, there was left main coronary artery bifurcating into a normal left anterior descending artery and a circumflex artery which showed minor disease. The circumflex artery continued as the second obtuse marginal branch after giving off to the first obtuse marginal artery. The distal circumflex artery could not be visualised associated with non-perfused myocardium (figures 1 and 2 and videos 1 and 2). This 'non-perfused myocardium' sign represents a myocardial region that is not supplied by any visualised vessel.¹ Dominant right coronary artery was seen filling through left to right collaterals.

Selective right coronary system angiogram showed the right coronary artery giving off a second branch (after conus branch) that crossed over to the left side perfusing the distal circumflex territory and the native right coronary artery was occluded. The branch that crossed to the left side continued as distal circumflex artery after giving third obtuse marginal artery (figure 3 and video 3). Hence it was concluded that the circumflex artery had its origin from both the left and right coronary systems. The left coronary system gave rise to the proximal left circumflex artery and obtuse marginals, whereas the

Figure 2 Selective angiogram of the left coronary system (left anterior oblique view) showing left main coronary artery dividing into the left anterior descending artery (horizontal arrow) and circumflex artery (vertical arrow) which continues as second obtuse marginal artery after giving off the first obtuse marginal artery.

right coronary system branched to distal circumflex and the third obtuse marginal artery.

This variety of anomalous circumflex artery has been rarely described in the literature and also termed as double circumflex arteries or twin circumflex arteries.² Only a few case reports are

Figure 1 Selective angiogram of the left coronary system (right anterior oblique view with caudal angulation) showing circumflex artery (vertical arrow) continuing as second obtuse marginal artery (horizontal arrow). Distal circumflex artery not seen.

Video 1. Selective angiogram of left coronary system (right anterior oblique view with caudal angulation) showing circumflex artery continuing as second obtuse marginal artery. Distal circumflex artery not seen in posterior atrioventricular groove where coronary sinus is clearly noted. Also sign of nonperfused myocardium noted with contracting myocardium and absent coronary vessel in the territory of distal circumflex artery.

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Video 2. Selective angiogram of left coronary system- (Left anterior oblique view) showing left main coronary artery dividing into left anterior descending artery and circumflex artery which continues as second obtuse marginal artery after giving off first obtuse marginal artery.

video 3. Selective angiogram of right coronary system- (right anterior oblique view with caudal angulation) showing the circumflex artery originating from right coronary artery. The circumflex artery crosses to left side and continues as distal circumflex artery giving off third obtuse marginal artery. Occluded right coronary artery noted.

available of this type of anomaly. This coronary anomaly usually has a retroaortic course and has been described as clinically benign. This variant is not haemodynamically significant, but may complicate valve surgery.^{1,3} The significance of the anomaly lies in patients undergoing percutaneous coronary intervention

Figure 3 Selective angiogram of the right coronary system (right anterior oblique view) showing the vessel originating from the right coronary artery that crosses to the left side (blue vertical arrow). This vessel continues as distal circumflex artery (yellow vertical arrow) giving off the third obtuse marginal artery (blue horizontal arrow). Occluded right coronary artery noted (yellow horizontal arrow).

Learning points

- ▶ 'Sign of non-perfused myocardium' is an important clue to look for anomalous coronary arteries.
- ▶ Anomalous circumflex artery from the right coronary artery (usually retroaortic) might run through intramural or interarterial course during the crossing to the left side which needs confirmation through radiological imaging or aortic root angiogram.
- ▶ Coronary artery disease affecting this anomalous circumflex artery might cause difficulty in percutaneous interventions and cardiac surgery.

or cardiac surgery where it might be difficult and risk of vessel injury.⁴ If the anomalous circumflex originates from the right coronary sinus or very proximal right coronary artery, there might be a possibility of missing the artery unless the catheter is properly engaged during angiography. In our case, anomalous circumflex artery originated from the native right coronary artery and it was free of disease. The right coronary artery of our patient was recanalised (percutaneous coronary angioplasty) without difficulty.

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