Superdominant left-circumflex artery supplying significant proportion of RCA and LAD territory

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DESCRIPTION
Coronary artery dominance refers to whether the posterior descending artery (PDA) and posterolateral vessel (PLV) originate from the right coronary artery (RCA; 80%), left circumflex artery (LCX; left dominant 8–10%), or both (codominant). A vessel is considered super-dominant when it is extremely large and supplies the territory that is normally supplied by the other vessel.1–3

We present an interesting case of a 56-year-old hypertensive woman with no other significant medical or surgical history. The patient presented with unstable angina and was taken up for diagnostic angiogram, which incidentally revealed the presence of a super-dominant LCX artery; the artery supplied the PDA and PLV branches rendering the
RCA non-dominant and small calibred. This extremely large vessel also supplied the apex, and a significant portion of the territory normally supplied by the left anterior descending (LAD), as a consequence of which the LAD was also small calibred (type I vessel) with a diameter of around 1.5–1.75 mm (figures 1–4, videos 1–4). The patient had critical atherosclerotic stenosis of the LAD and the first major diagonal (D1) branch, which was managed by stent deployment in the LAD and D1. The postprocedure course of the patient has been asymptomatic so far.

The occurrence of a super-dominant LCX artery supplying the territory of the RCA as well as the LAD artery is an extremely rare and seldom reported phenomenon. The occurrence of coronary anomalies is usually incidental and is usually revealed during angiography for detection of atherosclerotic coronary artery disease. The clinical importance of having super-dominant vessels is the increased dependence of the heart on one vessel, which makes the consequence of its occlusion catastrophic.

Video 1  Left anterior oblique (LAO) cranial view showing an extremely large and serpentine left circumflex artery.

Video 2  Right anterior oblique (RAO) cranial view showing an extremely large left circumflex artery (LCX) wrapping around the apex, and revealing the undersized left anterior descending (LAD) artery (type 1).

Video 3  Right anterior oblique (RAO) caudal view showing an extremely large left circumflex artery (LCX) giving rise to posterior descending artery (PDA) and posterolateral vessel (PLV) branches and also wrapping around the apex with a small calibred left anterior descending (LAD).

Video 4  Left anterior oblique (LAO) view showing a non-dominant right coronary artery.
Learning points

▸ An extraordinarily long left circumflex artery (LCX) forms a rarely reported and interesting fluoroscopic image. It is extremely rare for the LCX to be so long that it covers the entire left ventricular apex and also rare for it to supply a significant portion of left anterior descending and right coronary artery territory.

▸ Coronary anomalies are usually asymptomatic and incidentally picked up during angiographic investigations, but an anomalous course of coronaries between great arteries or compression of the slit-like coronary ostia can sometimes be a cause of sudden cardiac arrest even in young individuals.

▸ Coronary anomalies are best diagnosed using a CT angiogram, which gives three-dimensional information of the origin as well as the course of the coronaries; this can sometimes be useful to diagnose potentially life-threatening coronary anomalies.

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REFERENCES

