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

Navin Agrawal

Department of Cardiology,
Orange Hospital, Gujarat, India

Correspondence to

Dr Navin Agrawal,
drnavinagrwal@gmail.com

Accepted 5 April 2015

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

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

Figure 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 calibrated left anterior descending (LAD).

Figure 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).

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

To cite: Agrawal N. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-210365

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

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.

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).

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.^{1–3} 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 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.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Javangula K, Kaul P. Hyperdominant left anterior descending artery continuing across left ventricular apex as posterior descending artery coexistent with aortic stenosis. *J Cardiothorac Surg* 2007;21:42.
- 2 Singh SP, Soto B, Nath H. Anomalous origin of posterior descending artery from left anterior descending artery with unusual intraseptal course. *J Thorac Imaging* 1994;9:255–7.
- 3 Patra S, Srinivas BC, Agrawal N, *et al*. Super dominant left anterior descending artery with origin of both posterior descending artery and posterior left ventricular artery from septal branch. *BMJ Case Rep* 2013;2013:pii: bcr2013010303.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow