



# Superdominant left circumflex with absence of the right coronary artery: an interesting and very rare coronary anomaly

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**Abstract:** Coronary artery anomalies (CAA) are congenital changes in their origin, course and/or structure. Most of them are discovered as incidental findings during coronary angiographic studies or autopsies. A vessel is considered superdominant when it supplies the myocardium normally perfused by the other vessel. The occurrence of a superdominant left circumflex (LCx) artery supplying the territory of the right coronary artery (RCA) is extremely rare. We present the case of a 64-year-old woman complaining of stable angina at moderate efforts, with a positive treadmill test, referred to angiography, which incidentally revealed a very rare and interesting coronary anomaly circulation pattern.

**Keywords:** Coronary artery anomalies (CAA); superdominant left circumflex; coronary angiography

Received: 02 November 2018. Accepted: 16 November 2018; Published: 11 December 2018.

doi: 10.21037/jxym.2018.11.02

**View this article at:** <http://dx.doi.org/10.21037/jxym.2018.11.02>

Coronary artery anomalies (CAA) are a diverse group of congenital disorders, and the pathophysiological mechanisms and manifestations are highly variable. Several controversies remain in terms of its incidence, classification, screening, heredity and treatment. Most of them are discovered as incidental findings during coronary angiographic studies or at autopsies (1-3).

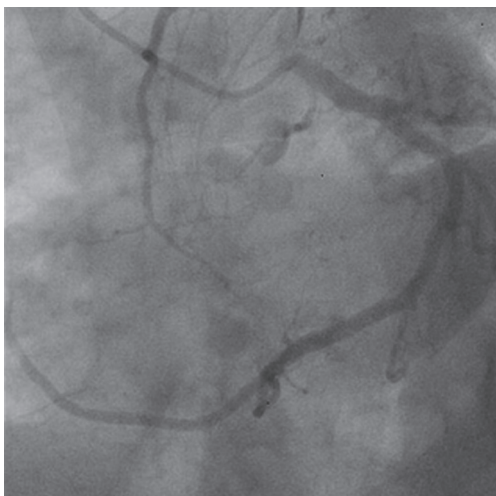
A vessel is considered superdominant when it supplies the myocardium normally perfused by the other vessel (4). The occurrence of a superdominant LCx artery supplying the territory of the RCA is an extremely rare phenomenon (4,5). It has also been described in the literature as anomalous RCA originating from the LCx.

A 74-year-old woman complaining of stable angina at moderate efforts, with a positive treadmill test was then referred to elective coronary angiography. The LCx showed a superdominant pattern, with various obtuse marginal,

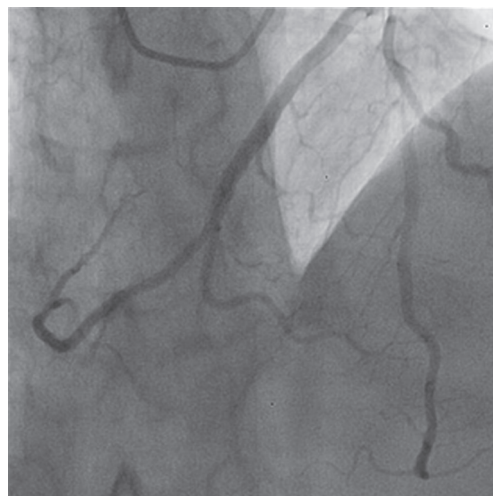
posterior descending and posterolateral branches, extending beyond the *crux cordis*, circling the atrioventricular groove, following the expected path of the absent RCA (Figures 1-6). Aortograms and non-selective injections of contrast media into the right coronary sinus showed no emergent arteries, confirming the congenital absence of the RCA (Figure 7). There was noted a marked stenosis at the ostium and the proximal portion of a large inferior branch of the second obtuse marginal, which was successfully treated with the deployment of a drug-eluting stent.

The multi-detector row computed tomography (MDCT) coronary angiography allows accurate and noninvasive depiction of CAA. Unfortunately, due to public health system limitations, this patient was referred to the invasive angiography instead of the MDCT.

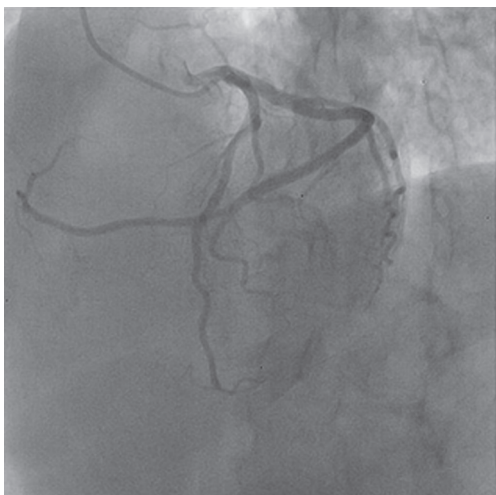
The non-visualization of the RCA from the right coronary sinus in the setting of acute coronary syndromes



**Figure 1** The superdominant LCx, with various obtuse marginal, posterior descending and posterolateral branches, extending beyond the *crux cordis*, circling the atrioventricular groove, following the expected path of the absent RCA. Anteroposterior caudal view. LCx, left circumflex; RCA, right coronary artery.



**Figure 3** The superdominant LCx, with various obtuse marginal, posterior descending and posterolateral branches, extending beyond the *crux cordis*, circling the atrioventricular groove, following the expected path of the absent RCA. Cranial right anterior oblique view. LCx, left circumflex; RCA, right coronary artery.



**Figure 2** The superdominant LCx, with various obtuse marginal, posterior descending and posterolateral branches, extending beyond the *crux cordis*, circling the atrioventricular groove, following the expected path of the absent RCA. Cranial left anterior oblique view. LCx, left circumflex; RCA, right coronary artery.

can be mistaken for an ostial RCA occlusion. Any attempt at revascularization may result in inadvertent injury (e.g., perforation of the coronary sinus by forceful manipulation



**Figure 4** The superdominant LCx, with various obtuse marginal, posterior descending and posterolateral branches, extending beyond the *crux cordis*, circling the atrioventricular groove, following the expected path of the absent RCA. Anteroposterior caudal view (6). LCx, left circumflex; RCA, right coronary artery. Available online: <http://www.asvide.com/article/view/28800>

of the guidewire).

All interventional cardiologists and cardiac surgeons should be familiar with these anatomic variants since accurate recognition of the course and distribution of the coronary vessels is crucial for proper revascularization strategies in the presence of coronary artery disease.



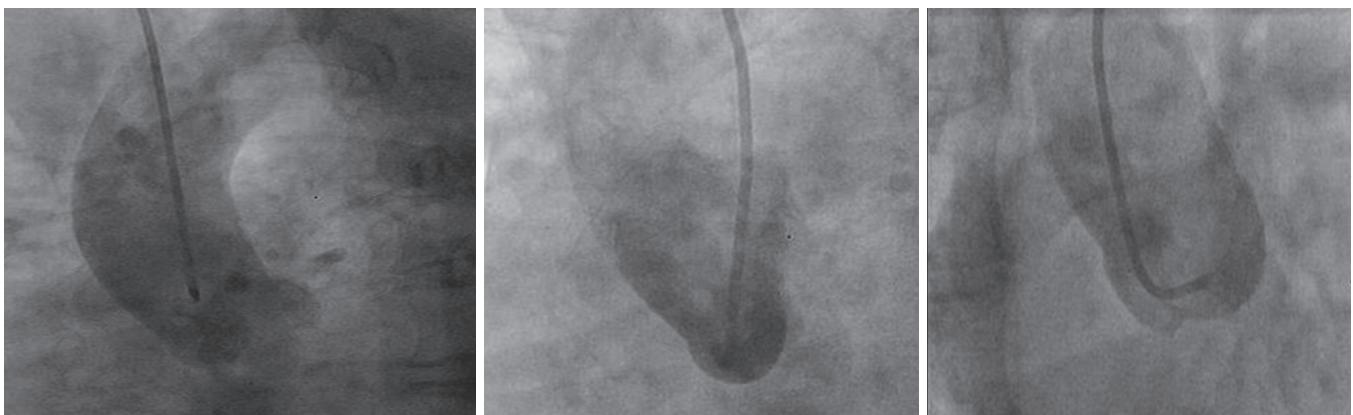
**Figure 5** The superdominant LCx, with various obtuse marginal, posterior descending and posterolateral branches, extending beyond the *crux cordis*, circling the atrioventricular groove, following the expected path of the absent RCA. Left anterior oblique caudal ("spider") view (7). LCx, left circumflex; RCA, right coronary artery.

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**Figure 6** The superdominant LCx, with various obtuse marginal, posterior descending and posterolateral branches, extending beyond the *crux cordis*, circling the atrioventricular groove, following the expected path of the absent RCA. Cranial left anterior oblique view (8). LCx, left circumflex; RCA, right coronary artery.

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**Figure 7** Aortograms and non-selective injections of contrast media into the right coronary sinus showing no emergent arteries, confirming the congenital absence of the RCA. RCA, right coronary artery.

## Acknowledgements

None.

## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

*Informed Consent:* Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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doi: 10.21037/jxym.2018.11.02

**Cite this article as:** Oliveira MD, Navarro EC, Ferraz TX, Silveira FS, de Sá GA, Castello Júnior HJ, Cantarelli MJ. Superdominant left circumflex with absence of the right coronary artery: an interesting and very rare coronary anomaly. *J Xiangya Med* 2018;3:42.