






Images in Cardiology

Once in a Blue Moon: Iatrogenic Coronary Dissection in Anomalous Coronary Artery

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Coronary anomalies are a rare phenomenon. One of the most observed coronary anomalies is the single coronary artery (SCA) originating from one coronary ostium and dividing into the coronary arteries in various configurations,¹ classified by Lipton's classification.²

A 38-year-old male patient was admitted to a community hospital with typical signs of non-ST-elevation myocardial infarction (NSTEMI) but without any known comorbidities. Urgent coronary angiography revealed a rare anomaly (incidence of 0.008%^{3,4}) of an SCA, with the left coronary system originating from the right coronary periphery, posterior to the great vessels (Lipton's classification R-IP, Table 1), and occlusion of the circumflex artery (CX; Fig. 1, A and B; Video 1 , view video online). A culprit-lesion percutaneous coronary intervention was attempted. However, despite the use of various flexible guidewires and angled microcatheters (90°), CX passage through the left main artery equivalent was not achieved (Video 2 , view video online) and resulted in ST elevation. A prompt control demonstrated a dissection of the left main artery (Figure 1C; Video 3 , view video online). Further interventional approaches were waived, and the patient was transferred for surgical revascularization.

Intraoperatively, coronary dissection was confirmed, whereas the left anterior descending artery and the CX were identified in the typical locations. Coronary revascularization was performed by anastomosis of the left internal mammary artery to the left anterior descending artery, and a saphenous

Novel Teaching Points

- The Lipton R-IP classification is the rarest SCA configuration, with the left coronary system originating from the right coronary periphery.
- Percutaneous coronary intervention of the left coronary system may be very challenging in cases of Lipton's R-IP classification.
- Surgical revascularization is a reasonable strategy, especially when the coronary periphery is in the typical location.
- An in-depth heart team approach is crucial to ensure the performance of “in-time” lifesaving treatments in such critical and complex cases.

vein graft to the CX was performed using the perfusion-assisted beating heart technique. The postoperative course remained uneventful, and the patient was discharged on the 10th postoperative day.

Table 1. Lipton's single coronary artery classification²

Criterion	Code	Description
Ostial location	R	Right sinus of valsalva
	L	Left sinus of valsalva
	I	The solitary domain vessel follows the course of either a normal right or left coronary artery
Anatomic distribution	II	One coronary artery arises from the proximal part of the normally located other coronary artery
	III	LAD and CX arise separately from a common trunk originating from the right sinus of valsalva
	Course of the transverse trunk	A
B		Between the aorta and the pulmonary arteries
P		Posterior to the great vessels
S		Septal type: a part of the route passes through the interventricular septum
C		Combined type: combination of diverse routes

LAD, left anterior descending artery; CX, circumflex artery.

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See page 2 for disclosure information.

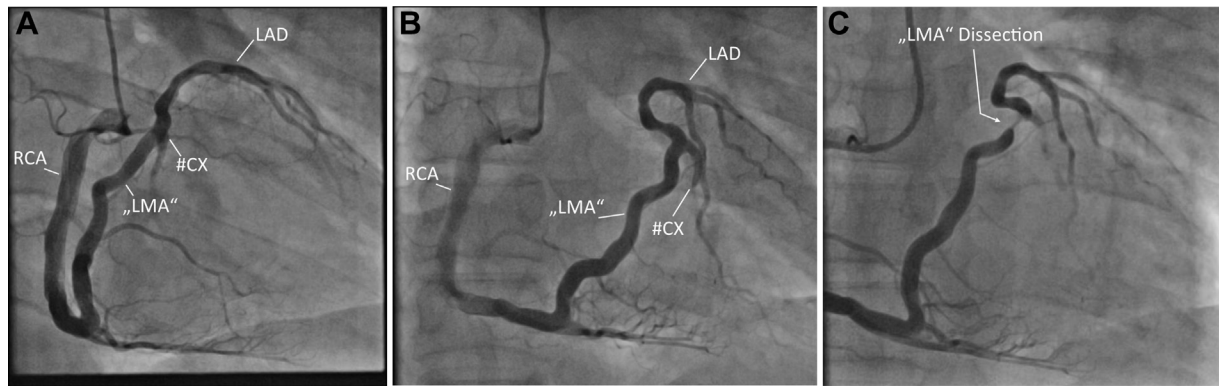


Figure 1. (A, B) Single coronary artery originating from the right coronary artery (RCA; Lipton classification R-IP (right sinus of valsalva; the solitary domain vessel follows the course of either a normal right or left coronary artery; posterior to the great vessels; see Table 1) with circumflex artery (CX) occlusion before percutaneous coronary intervention approach; (C) Dissection of left main artery (LMA) equivalent. LAD, left anterior descending artery.

The main issue in SCA remains the dependency on one system, with fatal results in the case of proximal occlusion. Given that the overall incidence of coronary anomalies is very low,³ the treatment strategy for acute coronary syndromes in patients with anomalous coronary anatomy remains unclear. In particular, an interventional approach in cases of complex coronary anatomy can result in coronary injury. Given that timing is critical in cases of myocardial infarction, an in-depth—even interhospital—heart team approach is crucial to ensure the performance of “in-time” lifesaving treatments.

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Disclosures

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Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at <https://www.cjopen.ca/> and at <https://doi.org/10.1016/j.cjco.2023.02.003>.