

## Case report - Coronary

## Dual left anterior descending artery distribution

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## Abstract

Dual left anterior descending (LAD) coronary artery with distribution of the vessels from the left main coronary artery and the right aortic sinus of Valsalva is a rare coronary anomaly. Here, we report such a rare anomaly in a young female with anterior wall myocardial infarction and stenting of the 'short' LAD coronary artery, which was subsequently confirmed in the operating room and by multi-slice cardiac computerized tomography after surgery.

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**Keywords:** Dual left anterior descending artery distribution; Heart vascular anomaly

## 1. Case report

A 43-year-old female presented at our institution with a history of stable angina pectoris 6 months before she experienced antero-apical Q wave (V1–V3) myocardial infarction, treated with direct stenting to proximal part of 'short' left anterior descending (LAD) coronary artery.

The result of repeated coronary angiography showed 95% in-stent stenosis of the proximal part of the LAD, 90% stenosis proximal and middle part of the left circumflex artery (LCx) (Fig. 1). The right coronary artery (RCA) was normal. There were some small branches with retrograde filling from the RCA. We suspected that it was distal part of the occluded LAD.

The patient underwent coronary artery bypass grafting. After opening the pericardium, we noticed a big coronary artery with a diameter of 1.8 mm, with origin from right sinus of Valsalva and run in the anterior interventricular sulcus (AIVS). We classified this finding as a long LAD and type IV anomaly of dual LAD distribution. The patient underwent a triple bypass with anastomosis of a left internal mammary artery (LIMA) to the long LAD. Saphenous vein graft to the short LAD (it was <1.5 mm diameter). Left radial artery (LRA) as a free graft to the big obtuse marginal branch of the LCx. Postoperative period was uneventful and the patient was discharged on the fourth postoperative day.

Subsequent 64-slice computerized tomography (CT) (GE 64-slice VCT Lightspeed CT-scanner) confirmed the type IV dual LAD distribution with 'long' one from the right sinus of Valsalva and good function of all three bypasses (Fig. 2, Video 1).

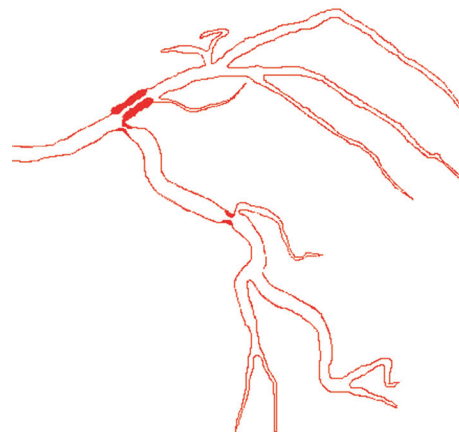
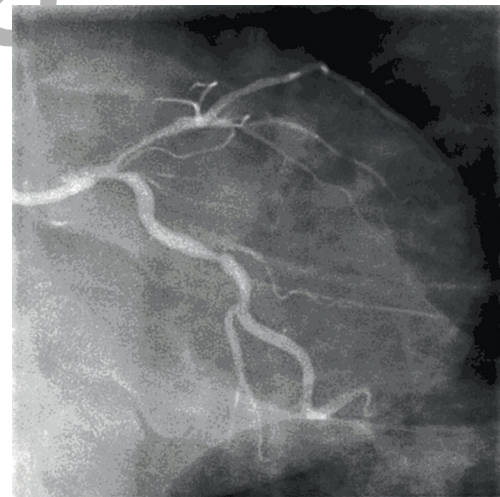


Fig. 1. Coronary angiogram of the LCA in the right anterior oblique projection, showing the 95% in-stent stenosis of the proximal part of the LAD, 90% proximal and middle part of left circumflex artery (LCx). LAD, left anterior descending.

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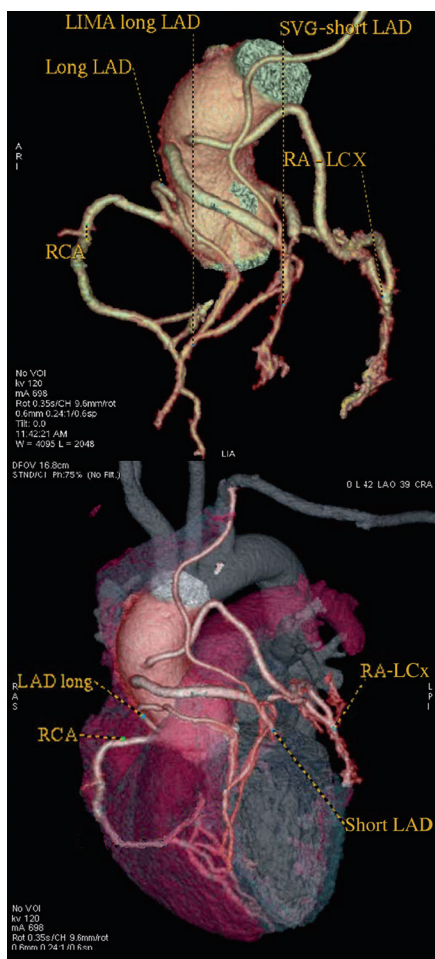


Fig. 2. 64-slice CT 3D reconstruction pictures of the type IV dual LAD distribution with 'long' LAD from the right sinus of Valsalva and good visualization of all three bypasses, three days after the operation. CT, computerized tomography; LAD, left anterior descending.

## 2. Discussion

According to Spindola-Franco and colleagues [1], the incidence of dual LAD in otherwise normal hearts is about 1%. Only a few cases of this anomaly have been reported [3–7].



Video 1. 64-slice CT 3D reconstruction video of the type IV dual LAD distribution with 'long' LAD from the right sinus of Valsalva and good visualization of all three bypasses, three days after the operation. CT, computerized tomography; LAD, left anterior descending.

The first description of a type IV dual LAD distribution was made in 1939, by Waterston et al. in the case of Sir James Mackenzie, who had this type of distribution [8].

Our patient had a dual LAD distribution of the more common type IV variant Spindola-Franco and colleagues classification in which the short LAD originated from the left main, and the long LAD originated from a separate ostium close to the orifice of the RCA.

Long LAD proximal occlusion was not recognised during first angiography. The patient underwent stenting of the short LAD, but continued to experience angina. We suspected LAD occlusion by poor retrograde filling of the distal part of it from RCA. Intraoperative findings confirmed our suspicion and we revascularized the long LAD using LIMA. The 64-slice CT on the third postoperative day confirmed our proper surgical strategy.

Sajja and colleagues [9] described four successful operations of the dual LAD distribution and have emphasized the incorrect placement of an arteriotomy due to misrecognition of the anomaly; difficulties in identification and grafting of a short LAD and the intramyocardial course of the aberrant vessel are of concern during surgical revascularization [9].

In conclusion, both angiographers and surgeons must be aware of this rare coronary anomaly. The diseased vessels can be correctly identified even if one of the dual arteries is occluded by using 64-slice CT.

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