



## Dual Left Anterior Descending Coronary Artery – An Unusual Variant

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### Abstract

Dual Left Anterior Descending (LAD) Coronary artery is a very rare coronary artery anomaly. The origin of short LAD coronary artery from left main (LM) coronary artery shaft is a very rare variant. Our patient is a 60 year old male who was thrombolysed with Tenecteplase elsewhere for acute anterior wall myocardial infarction. Coronary angiogram done in our institution revealed normal origin of left and right coronary arteries from aorta. A short LAD is seen arising from LM coronary artery shaft entering proximal portion of anterior interventricular groove giving rise to small septal and diagonal branches. The LM coronary artery then bifurcates into LAD (long LAD) and left circumflex coronary arteries. The long LAD gives rise to major diagonals and septals and enters the anterior interventricular sulcus (AIVS) distally. Only one case report of this variant has been reported in literature till date.

**Keywords:** coronary artery anomaly, short LAD, long LAD

### Case Report

A 60 year old male presented with sudden onset, severe retrosternal chest pain of four hours duration to a nearby hospital. He was diagnosed to have acute anterior wall myocardial infarction and was thrombolysed with tenecteplase. Coronary angiogram done in our institution revealed normal origin of left and right coronary arteries from aorta. The presence of dual LAD was noted. The short LAD was seen arising from the shaft of LM artery, entering the proximal portion of AIVS giving rise to short septals and diagonals. The LM then bifurcated into LAD (long LAD) and left circumflex (LCx) arteries. The long LAD was seen coursing on the left ventricular side of the AIVS giving rise to major diagonals and septals and re-entering the AIVS distally. The long LAD had 70% discrete lesion in its ostio-proximal segment and 50-70% discrete lesion in its

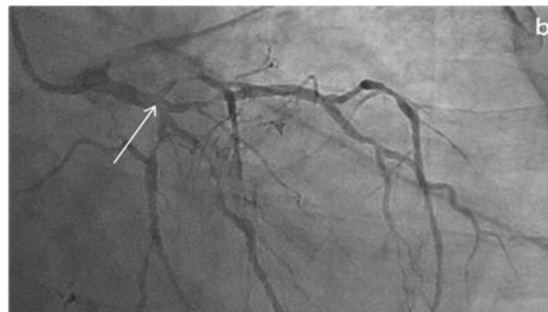
mid segment with the distal vessel being graftable. The short LAD had 50-70% discrete lesion in its proximal segment with distal vessel being graftable. The non-dominant LCx had 70-90% discrete lesion in its distal segment with the first obtuse marginal branch (OM 1) being graftable. The right coronary artery was cut off proximally with distal faint filling through homocollaterals. The patient was then referred for coronary artery bypass surgery with grafts to distal long LAD, distal short LAD, OM 1 and posterior descending artery (PDA).

### IMAGES OF DUAL LEFT ANTERIOR DESCENDING CORONARY ARTERY

LAO CAUDAL VIEW



RAO CAUDAL VIEW



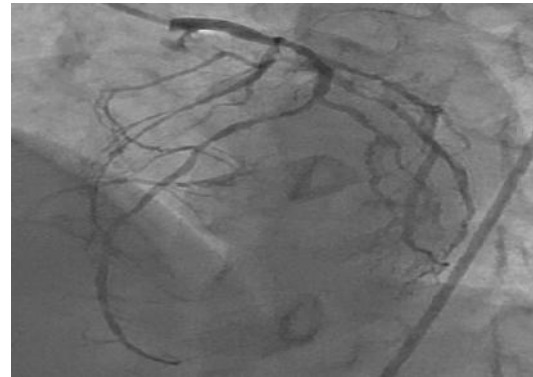
AP CAUDAL VIEW



LAO CRANIAL VIEW



LAO CRANIAL VIEW SHOWING SHORT LAD IN PROXIMAL AND LONG LAD IN DISTAL INTERVENTRICULAR GROOVE



## Discussion

Dual LAD is a very rare coronary artery anomaly. The first description was given by Spindola et al in 1983.<sup>1</sup> They classified dual LAD into four types of which type 1 was the most common variety. Two more variants were added to the classification system later. In the first three types, long and short LADs originate from a common LAD trunk whereas in the fourth variety, long LAD originates from RCA and has pre-pulmonic course to the anterior interventricular sulcus. In the fifth and

**TABLE 1 – CLASSIFICATION OF DUAL LAD<sup>2</sup>**

Type	Origin		Course of long LAD	Major Branches	
	Short LAD	Long LAD		Short LAD	Long LAD
I	Proximal LAD	Proximal LAD	Epicardial course on the LV side of the proximal AIVG, reentering the distal AIVG	Septal	Diagonal
II	Proximal LAD	Proximal LAD	Epicardial course on the RV side of the proximal AIVG, reentering the distal AIVG	Septal and diagonal	
III	Proximal LAD	Proximal LAD	Intramyocardial course in the proximal septum, then either emerging epicardially in distal AIVG or terminating intramyocardially as septal branches	Diagonal	Septal
IV	LMCA	Proximal RCA	1. Epicardial course anterior to the RVOT continuing to the distal AIVG	Septal and diagonal	
			2. Intramyocardial course within crest emerging epicardially in the distal AIVG		
V	LCS	RCS	Intramyocardial course within the septal crest emerging epicardially in the distal AIVG	Septal and diagonal	
VI	LMCA	Proximal RCA	Epicardial course between the RVOT and the aortic root, continuing to the mid or distal AIVG	Septal and diagonal	Diagonal

In all the cases short LAD originated from the common LAD trunk after its bifurcation from LM artery. In our patient, the short LAD originates from LM shaft and the long LAD arises as a bifurcation branch of the LM artery. The short LAD enters the AIVS proximally giving rise to short septals and diagonals. The long LAD courses along left ventricular side of AIVS and re-enters the AIVS distally. Thus, our patient has a very rare variant of dual LAD. Only one case with such a variation of dual LAD has been reported in the literature till date by V Subbanet al.<sup>3</sup>

### **Clinical implication**

The presence of another LAD (short LAD) in a patient is of clinical importance. This vessel can be the source of myocardial ischaemia in the presence of other normal coronary arteries. Any significant lesion in this vessel needs correction to alleviate myocardial ischaemia as seen in our patient. The presence of dual LAD warrants a meticulous search by angiographers and surgeons

### **References**

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