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DUAL LEFT ANTERIOR DESCENDING (LAD) ARTERY: A RARE AND INTERESTING CORONARY ANOMALY: A CASE REPORT

Cardiology

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ABSTRACT

64 years old male presented with typical angina for last 4 hours with stable vitals and unremarkable systemic examination. His ECG was suggestive of ST segment elevations in inferior leads with elevated troponin levels. Patient underwent urgent coronary angiography to plan for revascularization. Angiography revealed an interesting and rare coronary anomaly with dual left anterior descending arteries; where one artery came from left coronary and other originated from proximal right coronary. Right coronary artery was culprit in this case which was stented. This patient had type 4 variant of Dual LAD. It is important to be aware of this anomaly particularly while planning for CABG.

KEYWORDS

INTRODUCTION:

Coronary artery anomalies are relatively rare, occurring in approximately 0.6%–1.3% of cases undergoing coronary angiography. In normal coronary circulation, the left coronary artery (LCA) arises from left coronary cusp (LCC) and divides into the left anterior descending (LAD) and left circumflex (LCX) arteries. LAD courses along with the anterior interventricular sulcus (AIVS) until it reaches the apex. Among all coronary arteries, LAD has most consistent course 1,2. A dual LAD refers to two distinct LAD arteries supplying corresponding myocardial territory, often a short LAD and a long LAD 3. Here we present a rare form of dual LAD artery where it arises from both LCC as well as RCC.

Case Presentation :

64 years old male smoker without any known comorbidities presented with typical angina with excessive sweating for last 4 hours. A physical examination revealed that the patient was afebrile with unremarkable cardiac and respiratory system examination. He had a blood pressure of 130/90 mm Hg, a heart rate of 72 beats per minute, an oxygen saturation level exceeding 96%, and a respiratory rate of 14 breaths per minute. Electrocardiogram (ECG) was suggestive of ST segment elevations in inferior leads (II, III, aVF) and ST depression in I, aVL, V1-V3. His high sensitive troponin I level was 1689.7 pg/mL (normal <34.2 pg/mL) at 4 hours after symptom onset. Echocardiogram was suggestive of regional wall motion abnormalities of basal inferior, inferoseptal and inferolateral territory with mild left ventricular dysfunction. A diagnosis of acute coronary syndrome with inferior wall myocardial infarction was made. Patient underwent urgent coronary angiography to plan for revascularization. Selective injection of LCA revealed LCX and a short LAD arising from it. The short LAD coursing and giving rise to a diagonal branch and septal branches; terminating in proximal portion of AIVS (Figure 1). Selective injection of RCA revealed a longer LAD arising from proximal RCA having intramyocardial or septal course (as seen on RAO view) running in mid and distal portion of AIVS giving diagonal and septal branches reaching up to cardiac apex (Figure 2). RCA in mid portion having near total thrombotic occlusion with distal TIMI grade 1 flow. Angioplasty and stenting of culprit RCA was performed. This patient had Dual LAD with shorter LAD arising from LCA and longer LAD arising from proximal RCA; thus constituting even rarer form of dual LAD type 4. The longer LAD artery arising from RCA is forming a lower eye taking septal course to reach AIVS.

DISCUSSION:

Dual LAD is a rare form of coronary anomaly where one of the LAD arteries travels along the proximal part of the AIVS but terminates well short of the apex ('short LAD') while the second LAD joins the AIVS mid to distally and reaches the apex after originating elsewhere ('long LAD'). Spindola-Franco et al described four types of dual LAD. In the first three types, the 'short' and 'long' both LAD arise from the LCA. But in an interesting form of type 4 dual LAD the 'short LAD' arises from the LCA while the 'long LAD' arises from the RCA3. Recently a novel classification system is advocated by Jariwala et al on basis of origin and course of vessel.4 Once dual LAD is identified on angiography or CT, one of the three groups is allocated to dual LAD: those originating entirely from the LCC (Group I), those which originate partially from both the LCC and RCC (Group II), and those which originate entirely from the RCC (Group III). It should be sub classified into one of four subgroups based on the course of the longer LAD: anterior or epicardial (A), interarterial (B), septal or intramyocardial (S), and posterior or retro-aortic (P). this classification is simplified and give better idea of not only origin but also course of the dual LAD system4. Based on this newer system, our patient had the dual LAD arteries belonging to group II with intramyocardial (S) course. It is pertinent to be aware of this anomaly since it can cause confusion on angiography; making a wrong impression of totally occluded LAD due to short course of LAD arising from LCA. This anomaly is of even greater importance while planning coronary artery bypass graft surgery.

Figure:

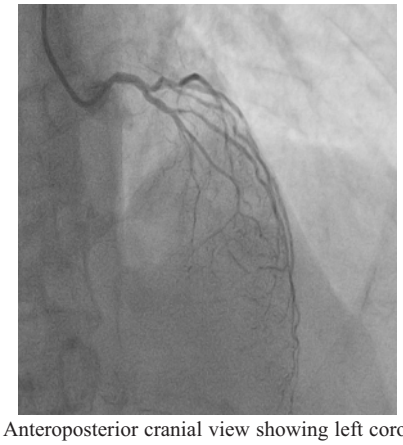

Figure 1: Anteroposterior cranial view showing left coronary artery dividing into a short left anterior descending artery (which terminates in mid portion of anterior interventricular sulcus after giving a diagonal and septal branches) and a left circumflex artery.

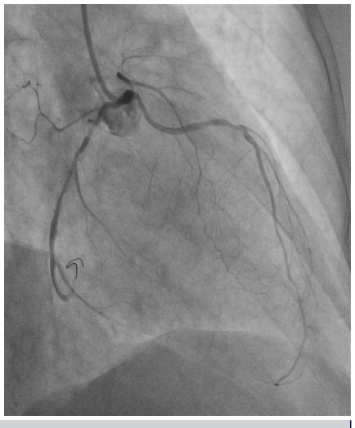

Figure 2: Right anterior oblique view showing a longer left anterior descending artery arising from proximal right coronary artery having septal course ('lower eye") and running into mid to distal anterior interventricular sulcus giving diagonal and septal branches.

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