



Accessory Left Circumflex Arising from Left Coronary Sinus

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Abstract

Coronary artery anomalies are rare in the general population, with a prevalence rate of about 0.2% to 2.3%. Occurrence of two circumflex arteries, one having usual origin from Left Main Coronary Artery (LMCA) and the accessory one arising from the left coronary sinus is an extremely rare finding which was not reported in our literature search. We present such a case in a 55 year old male patient.

Keywords: Dual circumflex; Accessory circumflex; Coronary CTA

Introduction

Coronary artery anomalies or variants are rare in the general population, ranging in prevalence rate from 0.2% to 2.3% [1]. Double Circumflex Arteries (CX) originating from the left and right coronary systems have been reported in the literature [2]. However, presence of two circumflex arteries, one having usual origin from the Left Main Coronary Artery (LMCA) and the accessory one arising from the left coronary sinus is an extremely rare finding unreported so far in literature. We present such a case to demonstrate this finding.

Case Presentation

A 55-year old male patient, who had symptoms of chest pain, underwent catheter coronary angiography by cardiologist. Right Coronary Artery (RCA) and LMCA were seen to arise separately from their respective sinuses. LMCA showed usual bifurcation into LAD and LCX. Minor stenosing plaques were seen in mid-distal LAD and LCX. However, another unusual artery was arising separately from the left coronary sinus that appeared to run in parallel to the LCX (Figure 1a). So patient was subjected to CT Angiogram (CTA) to delineate the origin and course of this artery. Coronary CTA was performed on 128 detector 256 slice Siemens Definition Flash (Erlangen, Germany) CT system with retrospective ECG gating. CTA confirmed the other findings of catheter angiography and LAD to be of type III (Figure 1b-1f). The accessory vessel was seen as a coronary artery arising from the left coronary sinus 2.7 mm posterior to the origin of LMCA. After origin, this vessel was seen to course along the left circumflex artery in the left atrioventricular groove. Terminally this artery was seen to reinforce the flow to the Posterior Descending Artery (PDA) originally supplied by RCA. Thus, on CTA this accessory LCX was seen as the third direct coronary from the aortic sinus, in addition to the LMCA and the RCA.

Discussion

Understanding the anatomical variants in the coronary artery origin and course is essential to depict the culprit artery in case of angina for treatment by angioplasty or surgery. Sometimes these variants also coexist with other intra-cardiac congenital pathologies like Tetralogy of Fallot or defects in the atrial or ventricular septum. A prior knowledge of this variant is useful in deciding the surgical plan or predicting the outcome.

The different congenital variants that have been reported are: high take-off (0.78%), separate Ostia for LAD and LCX (0.58%), RCA from left sinus of valsalva (0.35%), LCX originating from the right sinus of valsalva or from RCA (0.23%), single coronary artery (0.12%), LMCA from right sinus of valsalva (0.08%), abnormal origin of LMCA from pulmonary artery (ALCAPA) (0.04%), coronary artery fistulae (0.15%) [3]. Of these reported variants, a direct origin of LCX from the left coronary sinus has never been reported so far to the best of our knowledge as searched in Pubmed. It gives special weight age to this case due to its rarity. Although it is theoretically known to happen,

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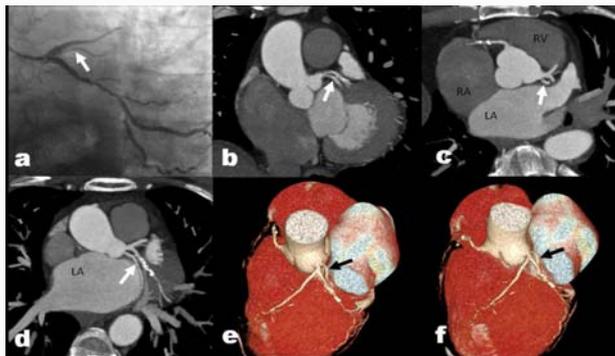


Figure 1: Coronary catheter angiogram (a) and CTA (b to f).

(a) Contrast injected through the catheter in left coronary sinus shows LAD and two LCX arteries. The accessory LCX (white arrow) is seen running parallel to the usual LCX. Origin could not be seen separately due to overlap. Narrowing and irregularity of mid LAD is seen.

(b) Oblique coronal MIP; (c), (d) oblique axial MIP images show separate origin of the accessory LCX (white arrow) posterior to the origin of left main coronary artery. Note the course of the accessory LCX parallel to the usual LCX in the left atrio-ventricular groove. Calcified atherosclerotic changes are seen in RCA and LCX (which is arising from the left main coronary artery).

(e, f) 3D volume rendered images clearly showing the accessory LCX (black arrow).

RA: Right Atrium; LA: Left Atrium; RV: Right Ventricle; MIP: Maximum Intensity Projection

our pictorial depiction of this variant is useful to the students and also to the treating physicians and surgeons. The reinforcement of the PDA territory by the terminal portion of this accessory LCX could also be beneficial to the posteroinferior part of the interventricular septum even in the presence of RCA disease.

To conclude: This variant does exist although unreported so far; coronary CTA can depict this entity with an advantage over the catheter angiogram due to the demonstration of the exact course in relation to the adjacent structures and CTA also gives information of the territorial supply that has a bearing on the patient's condition and treatment.

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