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Twin Circumflex Coronary Artery with anomalous origin from left main trunk — a rare variant

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Abstract

Coronary artery anomaly in form of dual origin of the circumflex artery is a rare anomaly. Though mostly described as having separate origin, both arising from left main coronary as twin circumflex artery itself has not been reported so far. Here we report a case of 57-year old male patient who had presented with ST elevation anterior wall myocardial infarction. His angiogram revealed left main trunk which was giving a left circumflex artery (LCx). On further coursing, left main trunk was trifurcating into left anterior descending artery (LAD), ramus intermedius and second left circumflex artery. Second circumflex branch was giving larger obtuse marginal branch while right coronary artery was smooth, non-dominant, and normal flowing artery. There was discrete eccentric stenosis with critical lesion in proximal LAD for which patient refused any intervention. Based on angiographic findings, it was diagnosed as a *twin circumflex*, both arising from left main trunk as one coming before the bifurcation while another after the bifurcation. An extensive search of literature and to the best of our knowledge, such type of anomaly is being reported for the first time.

Key words: Coronary Artery Anomaly; Twin Left Circumflex Artery; Dual Left Circumflex Artery

Introduction

Malformation within coronary buds during foetal development leads to coronary artery anomalies whose incidence varies from 0.6–1.5% [1–3]. However, dual circumflex artery is exceedingly rare anomaly with just few cases reported in the literature. By far the most common pattern of the dual circumflex artery is that it arises as a separate ostium from the right sinus of valsalva, and rarely as a proximal branch of right coronary artery.

They be either benign being diagnosed as an incidental finding during routine angiography, or may present with life-threatening conditions including congestive heart failure, arrhythmia, myocardial infarction, syncope and sudden death because of underlying atherosclerosis or anatomical course. Sometimes, they may present with inferior wall

myocardial infarction where usual circumflex arising from left main and right coronary artery (RCA) will be normal if one misses the second circumflex branch coming proximally RCA or right sinus.

Case report

A 57-year old male patient with a history of diabetes mellitus and dyslipidemia presented with excruciating retrosternal chest pain and sweating of 3-hours duration. His physical examination and biochemistry were all unremarkable. Electrocardiogram revealed ST-elevation in V_1 – V_4 with reciprocal changes in inferior leads. There was mild hypokinesia in left anterior descending territory (LAD TX) with ejection fraction of 48%. He was thrombolysed with tenecteplase- 40 mg which led to complete resolution of chest pain and electrocardiographic changes. He was taken for coronary angiogram through transradial route after proper consent on next day. Angiogram of left system revealed normal left main trunk which was giving a left circumflex artery (LCx). On further coursing, it was trifurcating into left anterior descending artery (LAD), ramus intermedius (RI), and another left circumflex artery (LCx). Second circumflex branch was giving larger obtuse marginal branch. There was discrete eccentric stenosis with critical lesion in proximal LAD (Fig. 1–3). Right coronary artery (RCA) was smooth, non-dominant, and normal flowing artery (Fig. 4). Although percutaneous coronary intervention was advised, it could not be performed as he refused. Based on angiographic findings, it was diagnosed as a double Cx arising from left main trunk where one was coming before the bifurcation and another after the bifurcation. The patient was discharged on the following day with aspirin-150 mg/day, clopidogrel-10 mg/day, atorvastatin-80 mg/day, metoprolol-100 mg/day and ramipril-2.5 mg/day. Patient is doing excellent since then with regular follow-up at our institute.

Discussion

Normally, the left main coronary artery originates from the left sinus of Valsalva and continues as the left anterior descending artery after giving rise to left circumflex artery. The left circumflex artery may have a separate origin of LAD and LCx arteries, followed by an LCx artery arising from the right sinus of Valsalva where it comes out either separately from right coronary artery or may come as its first branch [3]. In a study by Wilkins [4], 71% patients with an anomalous circumflex artery had significant coronary atherosclerosis in the proximal portion of anomalous vessel, finding similarly shown in analysis from the Coronary Artery Surgery Study by Click et al [5]. The retro-aortic course of the anomalous circumflex

coronary artery may predispose this vessel to atherosclerosis in patients with coronary disease.

The sudden cardiac death in patients with coronary artery anomalies may result from either anatomical factors like vessel's slit-like, tangential origin that during exercise leading to ischemia and resultant arrhythmia, mechanical compression during their course, intramural hypoplastic, or underlying atherosclerosis.

Although there have been several cases of dual origin of a circumflex artery [6, 7], both artery arising from the left main stem has not been reported to date. Sometimes, one may need Multidetector computed tomography (MDCT) as an adjunctive tool for diagnosis. In our case, catheter based angiography alone was sufficient to make the diagnosis. Although in our case it was an incidental finding, had it been a diseased artery, it would have assume great importance. Therefore, the clinical significance of the anomaly may be important in patients undergoing percutaneous coronary intervention as if one needs to intervene the proximal branch, one will need a short guiding catheter as it is coming too proximally from left main stem. If one plans to intervene second branch, one will need a guiding with good back up support as it is coming too distally.

Conflict of interest

None

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Figure legend

Figure 1. Antero- posterior caudal view showing twin circumflex (red and white horizontal arrow) coming out of left main coronary artery (red down arrow). LAD is showing discrete, eccentric lesion in proximal part (arrowhead indicates ramus intermedius branch)

Figure 2. Straight lateral view showing twin circumflex (red and white arrowhead) coming out of left main coronary artery. LAD is showing discrete, eccentric lesion in proximal part (horizontal arrow indicates ramus intermedius branch)

Figure 3. Left anterior oblique view with caudal angulation showing twin circumflex (white arrowhead and horizontal arrow) coming out of left main coronary artery. LAD is showing discrete, eccentric lesion in proximal part (red horizontal arrow indicates ramus intermedius branch)

Figure 4. Normal, nondominant diseased free right coronary artery







