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Case Report

Anomalous right coronary artery from distal left circumflex coronary artery: a rare case report

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ABSTRACT

Coronary artery anomalies (CAAs) being a group of congenital disorders, present with highly variable manifestations and have diverse pathophysiological manifestations. In middle aged to elderly patients, a coronary anomaly is often an incidental finding. We presented a case of 65-year-old female with history of diabetes for past 9 years who presented to our emergency department with history of exertional chest pain for past 4 weeks. Anomalous origin of right coronary artery (RCA) from distal left circumflex artery (LCX) was observed on coronary angiography. Patient was managed with optimised medical therapy (OMT).

Keywords: CAAs, RCA, LCX

INTRODUCTION

CAAs encompass a wide range of abnormalities of coronary anatomy, ranging from those that are merely morphologic variants and do not have any clinical implications to those that have an established association with sudden cardiac death (SCD). CAAs were reported at 0.78%-1.3% in invasive angiographic studies and 0.99%-5.8% noted in coronary computed tomographic (CT) angiographic series.[1] The majority of CAAs do not have clinical repercussions and do not need intervention. However, some anomalies can intermittently or chronically impede myocardial perfusion, leading to clinical manifestations such as angina, myocardial infarction, congestive heart failure, ventricular aneurysms, or SCD.[2] The most common anomaly is the origin of LCX from RCA.[3] In most instances, the anomalous RCA originates from the left main stem and passes between the aorta and pulmonary artery.[4] A very rare variant of the single coronary artery anomaly is the origin of the RCA as a branch from the left anterior descending artery (LAD).[4]

Incidence of RCA arising from left coronary vasculature ranges from 0.1 to 0.9% with most of the published cases reporting RCA originating from proximal or middle portion of LAD.[5] Symptomatic patients have 3 treatment options: medical treatment/observation, coronary angioplasty with stent deployment and surgical repair.[6]

CASE REPORT

A 65-year-old female with a significant medical history of type 2 diabetes mellitus for past 9 years presented with complaints of angina on exertion for 4 weeks. Her vitals at presentation were stable. Her complete blood count and lipid profile was within normal limits. ECG showed normal sinus rhythm with non-specific ST/ T wave changes in anterior leads (Figure 1). 2D echocardiography showed regional wall motion abnormalities in LAD territory with mild mitral regurgitation with ejection fraction of 35% (Figure 2). The patient underwent cardiac catheterization coronary angiography which showed normal left main coronary artery (LMCA) arising from left

aortic sinus branching into LAD and LCX and an anomalous origin of RCA from distal LCX. LCX showed ostio-proximal plaque with 30-40% stenosis and LAD showed ostio-proximal 90% stenosis followed by proximal chronic total occlusion (CTO). Patient was managed medically with dual anti platelets, beta blockers, ACE inhibitors and nitrates.

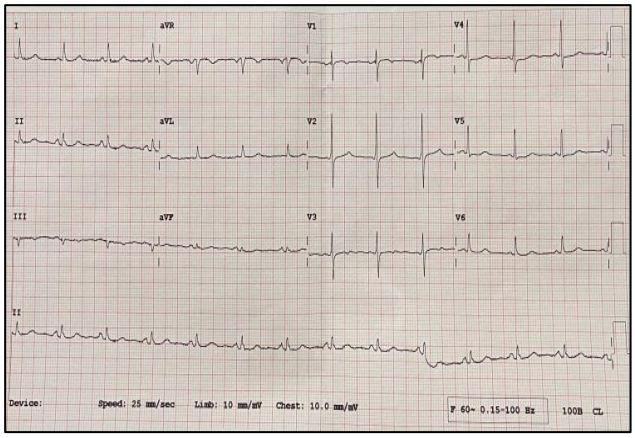

Figure 1: ECG of the patient showing non-specific ST-T wave changes in the anterior leads.

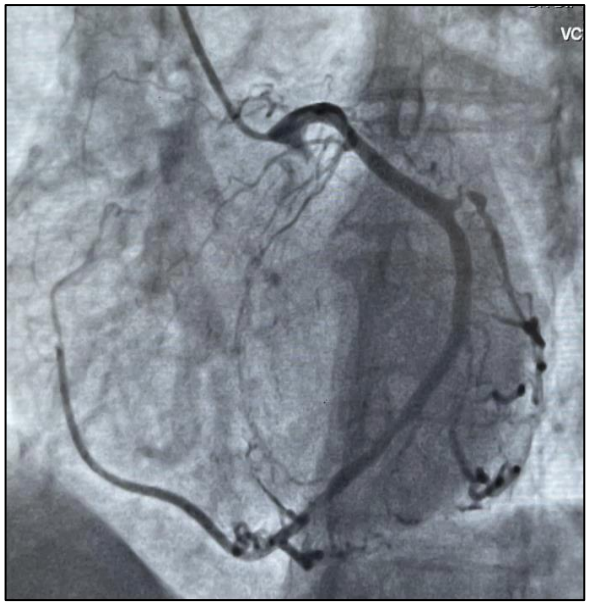

Figure 2: Coronary angiogram showing anomalous origin of RCA from distal LCX.

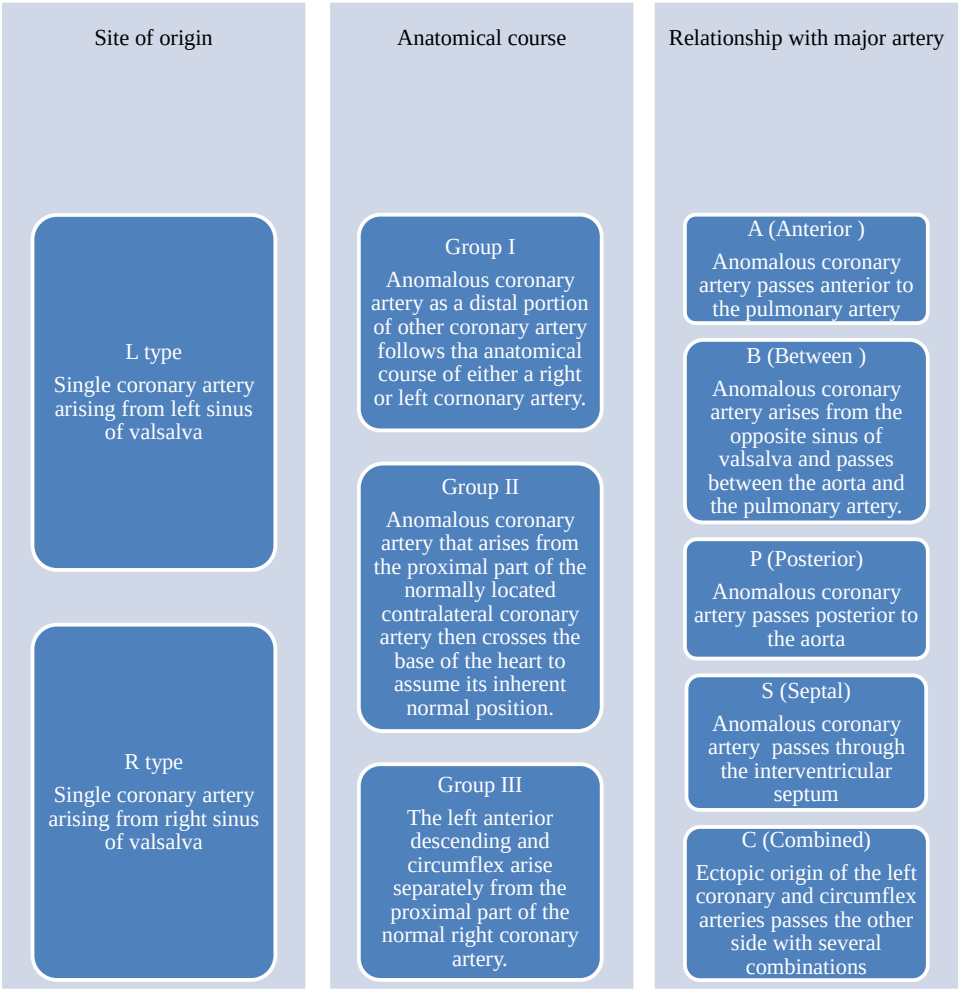

Figure 3: Classification of CAAs by site of origin, anatomical course and relationship with major vessels.[7]

DISCUSSION

Splanchnic mesoderm gives rise to all components of the heart, and the mesoderm differentiates into the cardiogenic area during the third week of embryogenesis.[7] Anomalies of coronary circulation result from processes that disrupt the normal differentiation and specialization of the primitive heart tube.[8] Position of the endothelial buds or septation of the truncus arteriosus may give rise to anomalous origins of coronary arteries.[9]

White et al first described the anomalous origin of the RCA as a rare congenital abnormality in 1948.[10] Incidence of RCA arising from the left coronary vasculature ranges from 0.1 to 0.9%.[5] Conventional CAG is the current gold standard for the diagnosis of coronary anomalies and for the assessment of coronary artery disease. Intravascular ultrasound helps if coronary angiogram is equivocal. Three dimensional and high-resolution assessment on multi detector row computed tomography allows precise description of origin and course of these anomalous coronary arteries in relation to the great vessels.[11]

Lipton classification modified by Yamanaka et al that precisely describes the course of anomalous vessel, is shown in Figure 3.[7,12] According to this classification our patient anomaly is classified as L-IA which is considered to be a course less likely to be associated with sudden cardiac death.

Most of these patients need either percutaneous or surgical revascularization as atherosclerosis is the most common cause of myocardial ischemia. For patients with anomalous course between aorta and pulmonary artery, rerouting of the coronary artery to the appropriate sinus can also be considered along with surgical revascularization, particularly in young patients with severe symptoms who are at risk of sudden cardiac death.[3]

CONCLUSION

CAAs are a cause of sudden cardiac death. Treatment of CAAs depend on the discovered anatomy. Symptomatic patients of anomalous origin of a coronary artery from the opposite sinus may undergo medical treatment/ observation, coronary angioplasty with stent deployment, or surgical repair.

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