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Cardiology

Anomalous Origin of the Right Coronary Artery from the Left Anterior Descending Artery: Case Report

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Abstract | **Case Report**

The anomalous origin of the right coronary artery as a branch of the left anterior descending artery is a very rare variation of single coronary artery with an incidence of 0.009%, in such cases; the RCA originates from the proximal or mid-portion of the LAD artery. So far only 40 cases have been reported in which the RCA originates from the LAD. We here introduce a case report of patient with a single left coronary artery associated anomalous origin of the RCA from the LAD.

Keywords: Right coronary artery, anomalous origin of coronary artery, coronary angiography.

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INTRODUCTION

A variety of coronary artery abnormalities occur in approximately 1% of the population [1] often, coronary artery anomalies are an incidental finding during examination of the patient. The majority of cases they don't manifest clinically during a person's life, less often they can lead to sudden death. There are several classifications of anomalies of coronary arteries, We here introduce 2 case reports of patients with a single left coronary artery associated anomalous origin of the RCA as a branch of the LAD.

CASE PRESENTATION

A 58-year-old female patient with a past medical history of hypertension and type 2 diabetes mellitus presents angina class 3 in the Canadian Cardiovascular Society (CCS) classification. On the electrocardiogram there were negative T waves in the inferior and lateral leads, laboratory examination was normal and the electrocardiography revealed Hypertensive cardiomyopathy. On coronary angiography, there was an anomalous right coronary artery as a branch of the left anterior descending artery.

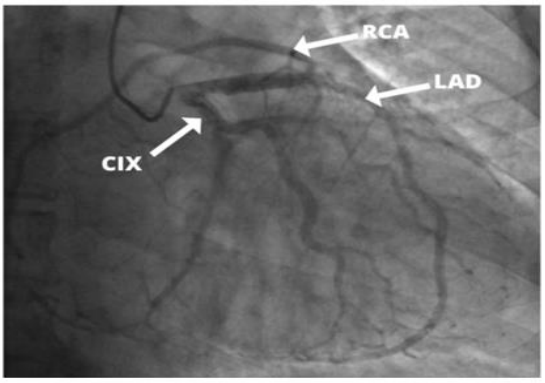

Figure 1: Ectopic origin of right coronary artery (RCA) from the MID left anterior descending artery (LAD), Anteroposterior projection

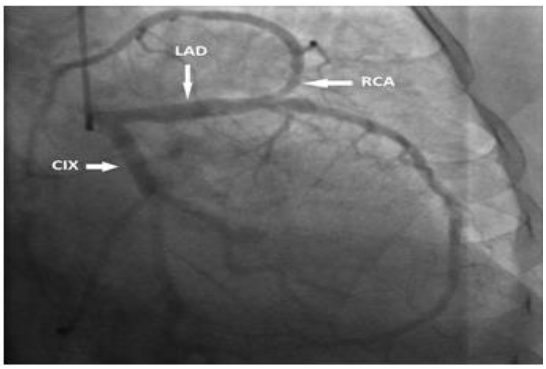

Figure 2: Ectopic coronary origins of the RCA from MID LAD, Caudal coronary angiography projection

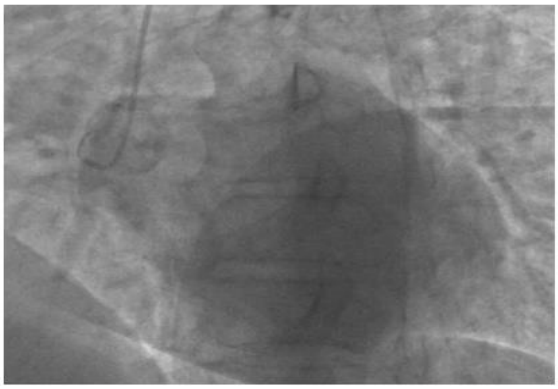

Figure 3: Absent right coronary artery on the Left anterior oblique view

DISCUSSION

During the 3rd week in utero the fetus may develop coronary artery anomalies which are defined as anatomical variants of normal coronary arteries

According to a retrospective analysis made by Yamanaka and Hobbs between 1960 and 1988 on 125,595 patients, the incidence of coronary artery anomalies detected by coronary angiography is 1.3% (1686 patients) dominated by anomalies of origin and distribution of 1.3% (1,461 patients) [2]. According to a recent study made in southwestern China on 11267 patients, the prevalence of anomalies of the origin of coronary arteries is 0.38% [3]. The incidence of patients with single coronary arteries generally represent between 0.008% and 0.067% of patients referred for coronary angiography in larger series [3].

The origin of an abnormal right coronary artery may be from the pulmonary artery, the ascending aorta ,the left sinus of Valsalva ,the posterior sinus of Valsalva, the left ventricle, the left main coronary artery, the Left descending artery or the Left circumflex artery

The RCA branch of LAD is an extremely rare variant of a single coronary artery abnormality. Only 40 cases have been reported, and in most cases, the RCA originates in the proximal or middle part of the LAD and reaches the PA via an anterior approach or is surrounded by large vessels. It rarely passes behind the aorta [4].

In most cases, coronary artery anomalies are not clinically recognized because they either do not cause symptoms, or the first and last manifestation of the disease is sudden death [5] however, patients may present symptoms such as dyspnea, palpitations, ventricular fibrillation, Chest pain, syncope, myocardial infarction.

The prognosis of an abnormal origin of the RCA from the LAD is generally benign, and does not interfere with coronary perfusion. But, when the abnormal artery passes between the pulmonary artery an aorta, can cause myocardial ischemia and sudden death [7].

The main tool for diagnosing coronary anomalies is coronary angiography, which has some side effects due to its invasiveness. With the development of technology, new non-invasive methods such as coronary computed tomography angiography (CTA) and cardiac magnetic resonance imaging (MRI) play an important role in the identification of coronary anomalies. Coronary computed tomography angiography is an important diagnostic tool for determining coronary artery abnormalities because of its high spatial resolution and rapid acquisition [4].

In a case report about a right coronary anomaly passing between the two great arteries the diagnosis was made using multi-slice coronary CTA, and the coronary angiography was not very contributive [6].

Treatment for the coronary artery anomalies may be medical, percutaneous or surgical. a number of authors have described percutaneous coronary intervention (PCI) for abnormal RCA as a branch of the left coronary system. Cardiovascular surgery is recommended for patients who cannot be effectively managed by PCI.

CONCLUSION

The anomalous origin of the right coronary artery as a branch of the left anterior descending artery, is an extremely rare variant of a single coronary artery abnormality, the prognosis of this defect is generally benign.

Anomalies of coronary arteries are very diverse. Due to angiography evolution, possibilities for their detection became.

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