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

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Introduction:

Congenital anomalous origin of coronary artery refers to the variations in the anatomic position of the coronary artery ostium, which is generally attributed to abnormalities in fetal coronary artery development. The pathophysiological mechanisms remain unclear. The anomalous origin of the right coronary artery is common. It is likely originated from left coronary sinus (44.87% in all anomalies), non-coronary sinus (4.70%), and rarely from left coronary system (2.14%)[1]. Recent coronary angiography in our hospital revealed a case of a single coronary artery whose right coronary artery originated from the proximal anterior descending - a very rare variant.

A 56-year-old female with a history of hypertension was admitted to our hospital with the complaint of exertional chest tightness and chest pain for more than 1 years. On admission, although the 12-lead electrocardiogram was basically normal, 24h Holter suggested the depression of T waves in inferior wall leads. To define the coronary conditions, the patient subsequently underwent coronary angiography which demonstrated a single coronary artery from the left Valsalva sinus and a small-tortuous RCA originating from the proximal LAD segment following the first diagonal branch. It coursed to the right and had no significant stenosis in the coronary tree (Fig.1 A and B). Right coronary sinus angiography confirmed the absence of the RCA stump or any other vessel (Fig.1 C and D).

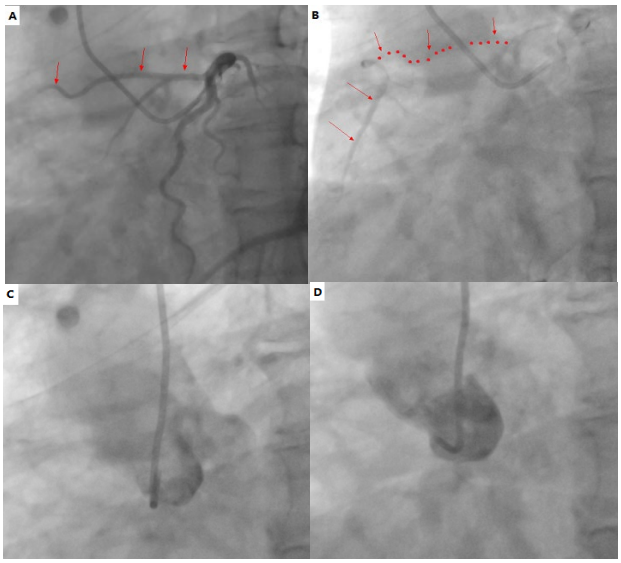

Fig.1: A&B: Anomalous RCA originating from the proximal LAD The red arrow marks the right coronary artery; C&D: Right coronary sinus and aorta injection confirmed the absence of the RCA.

So we considered that the patient's angina was partly caused by the myocardial ischemia, which could result from the coronary steal phenomenon due to ectopic RCA[2].

The anomalous origin of the coronary artery is considered to be a benign lesion. Most of patients are asymptomatic and have normal electrocardiograms at rest. However, their ischemia may emerge during activity. Some patients may also suffer from severe ischemic events such as myocardial infraction and sudden cardiac death[3]. Both treadmill exercise test and stress myocardial perfusion imaging are helpful in excluding malignant situation.

Treatment of coronary anomalies may be pharmacological, interventional or surgical. Percutaneous stenting and surgical revascularization have been reported to have preferable short-term effect, yet the long-term results have not been clarified[4]. Surgical repair is indicated when the left main artery arises from the right sinus and courses between the aorta and pulmonary artery, and when the right coronary artery arises from the left sinus and courses between the aorta and pulmonary artery associated with ischemic symptoms. When the patient has an anomalous right coronary artery and no evidence of ischemia, a conservative regimen may be reasonable. In view of the not uncommon incidence of anomalous coronary origins and their potential malignant consequences, it is imperative to conduct more researches to clarify the diagnosis, follow-up, and longer-term outcomes.

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