

Anomalous Right Coronary Artery Originating from the Left Main Coronary Artery

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A 50-year-old woman presented to our center with effort angina. Angiography showed normal left main coronary artery, normal left circumflex (LCX) artery and critical discrete lesion (99% stenosis) in mid part of left anterior descending (LAD) artery with good distal flow. However, the right coronary artery (RCA) originated from the left main coronary artery. There was no evidence of external compression of the proximal portion of the RCA during systole or diastole. Consult with cardiac surgeon was done but the patient refused from the operation.

Introduction

The three major coronary arteries generally course along the epicardial surface of the heart. The course of the anomalous coronary arteries is easily assessed by angiography in right anterior oblique (RAO) view. Although angiography is useful for diagnosis of the anomalous arteries, computed tomographic (CT) angiography may also be an important adjunctive diagnostic tool for establishing the course of the vessels.¹ Coronary artery anomalies are present in 1-2% of the population who undergo coronary angiography.² Single coronary arteries are very rare, with a necropsy incidence of 0.29% and right coronary artery (RCA) originating from the left main coronary artery accounts for only 0.65% of these anomalies.²

Case report

A 50-year-old man presented to our center

with effort angina for one month ago. His electrocardiogram was normal but exercise test with Bruce protocol was positive. Risk factors for coronary artery disease included hyperlipidemia and diabetic mellitus. The coronary angiography showed normal left main coronary artery, normal left circumflex (LCX) coronary artery and critical discrete lesion (99%) in mid part of left anterior descending (LAD) just before diagonal one, with good distal flow. However, RCA originated from the left main coronary artery and had diffused proximal to mid part lesion (60% stenosis) (Fig. 1). Non selective coronary angiography (aortography in aortic root) revealed absence of right coronary artery from the right coronary sinus (Fig. 2). Computed tomographic (CT) angiography also confirmed anomalous RCA originating from the left main coronary artery that course between the aorta and pulmonary artery (Fig. 2). There was no evidence of external compression of the proximal portion of the RCA during systole or diastole. Consult with cardiac surgeon was done but the patient refused from the operation.

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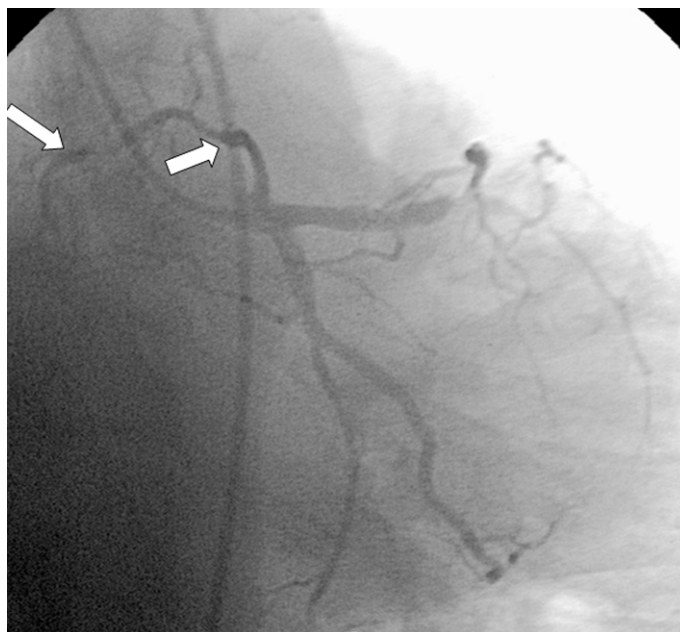


Figure 1. Coronary angiography shows anomalous right coronary artery originating from the left main coronary artery.

Discussion

Anomalous origin of the right coronary artery (RCA) is a rare congenital anomaly that was first described in 1948 by White and Edwards.³ The prevalence of this anomaly in the white population, as determined from autopsy

studies, has been reported to be 0.026%.⁴ It is well established that an anomalous origin of the RCA can lead to angina pectoris, myocardial infarction, or sudden death in the absence of atherosclerosis.⁵ The pathophysiologic basis for this association, however, is unclear. Me-

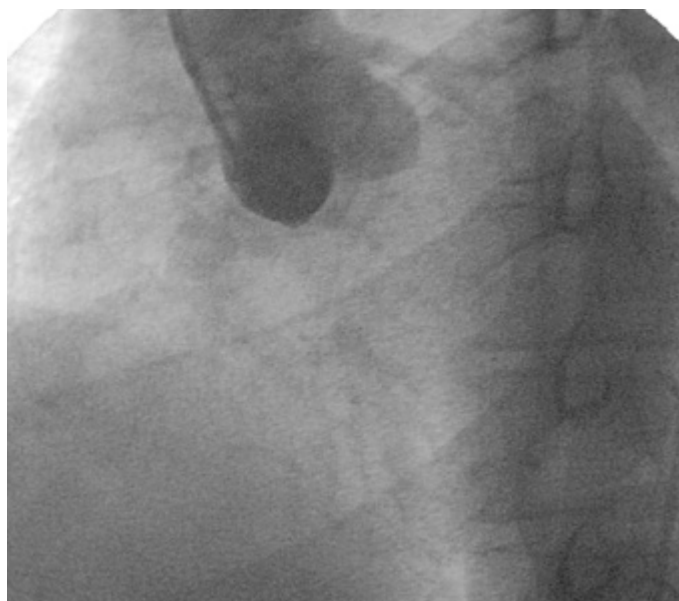


Figure 2. Non-selective coronary angiography shows absence of right coronary artery from right coronary sinus.

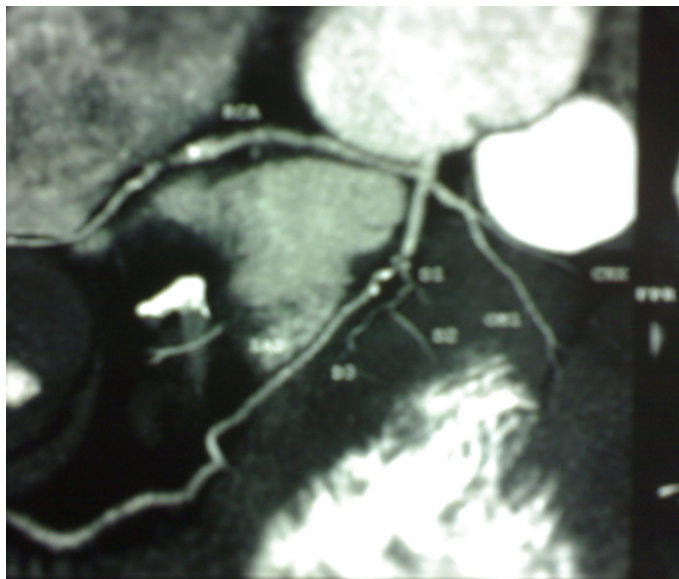


Figure 3. Computed tomographic(CT) angiography shows anomalous right corona artery originating from the left main coronary artery and courses between aorta and pulmonary artery.

chanical compression of the RCA by the great vessels is the usual explanation, because the anomalous RCA generally courses between the aorta and the pulmonary artery to its normal position. Others have suggested that the oblique angle at the juncture of the anomalous RCA and the left coronary sinus produces a slit-like orifice in the aortic wall that can collapse during exercise.⁵ In 1992, Taylor and co-authors,⁵ in their study of 52 patients with anomalous origin of the RCA, noted that 25% had sudden deaths which were asymptomatic in most cases. Moreover, the anomalous RCA was second only to the anomalous left main coronary artery as the cardiac anomaly most frequently associated with sudden cardiac death. Understandably, the choice of treatment for this coronary anomaly is controversial, with

some advocating revascularization in all cases. Proposed options include translocation of the RCA to the aorta, ostioplasty (excision of the common wall between the RCA and the aorta) and bypass grafting of the RCA, with optional ligation of the native artery proximal to the graft anastomosis to prevent competitive flow.⁶ However, the long-term benefits of such therapies have not yet been demonstrated. In this patient the RCA originated from left main coronary artery and coursed between aorta and pulmonary artery.

Acknowledgements

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