

Case Report

A Case of the Right Coronary Artery Atresia

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Abstract

We described a rare case of congenital right coronary artery (RCA) ostial stenosis or atresia (COSA) without other cardiac structural abnormalities. In the absence of coronary atherosclerosis the possible mechanism responsible for the chest pain in those patients include: inadequate caliber, systolic kinking, angulating, or compression of the collateral arteries, as well as the length and tortuousness of the collateral arteries, which could cause a delay in the delivery of blood to the right-sided arteries. Development of right ventricular hypertrophy and consequent increase in myocardial oxygen demands can also potentially contribute to ischemic symptoms. Our patient was treated with oral beta-blockers, and did well with no further episodes of chest pain.

ABBREVIATIONS

RCA: Right Coronary Artery; COSA: Congenital Ostial Stenosis/Atresia; LCA: Left Coronary Artery; LAD: Left Anterior Descending; AP: Anterior/Posterior; LAO: Left Anterior Oblique; MIP: Maximum Intensity Projection

INTRODUCTION

Variations of the coronary artery origin are due to alteration in the development of aorta during embryonic period. Here, we present a case of right COSA as a potential cause of an angina pectoris.

CASE PRESENTATION

A 56 year old female was referred to cardiology clinic with the new onset of an exertional chest pressure. She had a history of hyperlipidemia, was a nonsmoker, and had no significant family history of coronary artery disease. Troponin I level was normal and baseline ECG demonstrated no ischemic changes. The transthoracic echocardiogram did not reveal any structural abnormalities. The cardiac catheterization was performed which demonstrated a left coronary artery (LCA) with extensive collaterals filling the entire right coronary artery (RCA) briskly. The collateral network consisted of the prominent preconal anastomotic ring originating from the left anterior descending (LAD) artery, coursing anterior to the pulmonary artery, and connecting to the RCA which was of normal caliber and had normal course (Figure 1A). In addition, distal collaterals were connecting the septal branches of the LAD and distal branches of the left circumflex coronary artery to the RCA (Figure 1B). The patient was referred to the CT coronary angiography, which revealed intact left and right coronary circulation, and atresia of the RCA ostium, the proximal RCA didn't open in right coronary cusp, and ended in a blind pouch (Figure 2,3).

1B). The patient was referred to the CT coronary angiography, which revealed intact left and right coronary circulation, and atresia of the RCA ostium, the proximal RCA didn't open in right coronary cusp, and ended in a blind pouch (Figure 2,3).

DISCUSSION

To our knowledge, this is only the third case of isolated right COSA without coexisting other cardiac structural abnormalities reported in the literature [1-3]; on the other hand, COSA of the LCA has been more extensively reported and reviewed [4,5]. Many patients with LCA COSA seem to have normal, unrestricted

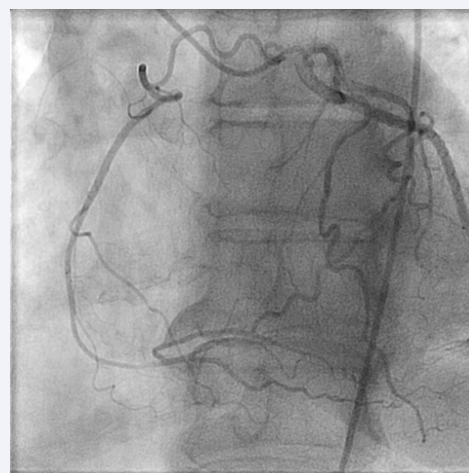


Figure 1 Left coronary artery injection in AP cranial projection. Multiple collaterals from the distal circumflex artery and proximal LAD fill the RCA.

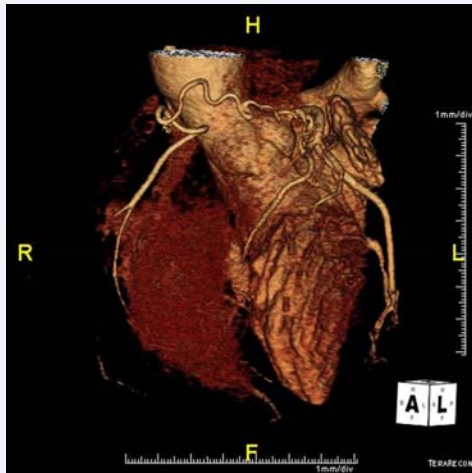


Figure 2 3D volume rendered reconstruction in an LAO projection showing the LCA and the collaterals supplying the RCA.

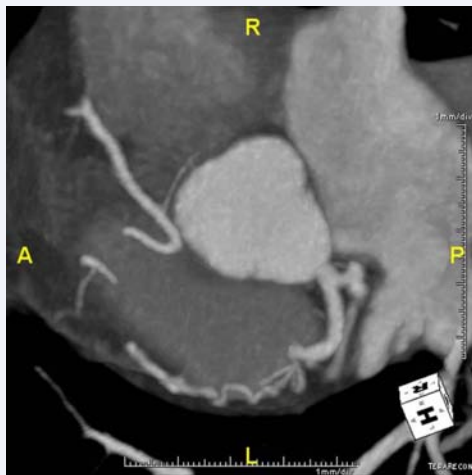


Figure 3 Cardiac CT angiography maximum intensity projection (MIP) rendering of the aortic root and coronary arteries in a short axis projection. The RCA is normal in course and caliber except for ostial atresia.

development and are asymptomatic until more advanced age, when the chest pain develops [5]. In the absence of significant coronary atherosclerosis; the possible mechanism responsible for the chest pain may include: inadequate caliber, systolic kinking, angulating, or compression of the collateral arteries, as well as the length and tortuousness of the collateral arteries, which could cause a delay in the delivery of blood to the left or right-sided arteries, having blood arrive during systole rather than diastole [6-8]. Development of ventricular hypertrophy and consequent increase in myocardial oxygen demands can contribute to ischemic symptoms [9]. Our patient was treated with oral beta-blockers, and did well with no further episodes of chest pain.

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