

Anomaly of the Conus Artery Arising from the Right Coronary Artery

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Some anomalies of the conus artery are relatively common, such as those arising from the discrete ostium of the right coronary artery. We report a 63 y/o male with an unusual anatomic variation of the conus artery terminating in the pericardium. Coronary anomalies may cause coronary ischemia, infarction and sudden cardiac death; hence, it is significant to identify coronary anomalies. Here, we identify an unusual conus artery anomaly for the first time, with accompanying imaging showing its very rare anatomical features that may be of interest to the larger medical community.

Key Words: Anomaly • Coronary angiography • Coronary artery

INTRODUCTION

The number of coronary angiography procedures has been growing for the last 20-30 years, and coronary anomalies are encountered with much greater frequency. The prevalence of congenital coronary anomalies in autopsy and angiography studies ranges from 0.3-1.3%.¹ The conus artery is generally considered to be the first branch of the right coronary artery (RCA) in the right sinus of Valsalva. However, one study has shown that in approximately 50% of humans, the conus artery arises from a discrete ostium in the right sinus of Valsalva.² The conus artery supplies both the right ventricular outflow tract and a large portion of the anterior free wall of the right ventricle. In addition, the conus artery usually forms an anastomosis with the corresponding branch of the left coronary artery (LCA). This anastomosis is known as the Vieussens arterial ring.³ Herein, the anomaly that we encountered is identified for the first time.

CASE REPORT

A 63 year-old male who had undergone aorta-coronary bypass surgery and followed-up by medical treatment for seven years was admitted to our cardiology clinic complaining of exercise-induced chest pain. His blood pressure and heart rate were 140/80 mmHg and 75 bpm, respectively. Heart and respiratory auscultation were normal and his electrocardiogram showed sinus rhythm with nonspecific V2-5 ST-T changes. On echocardiography, he had normal left ventricular systolic function (ejection fraction 58%). Selective coronary angiogram was performed due to angina pectoris and, surprisingly, revealed a conus artery arising from the right sinus of Valsalva (Figure 1) and communicating on the posterior pericardium with the collaterals which have a movement synchronized to each cardiac cycle (Figure 2). The right coronary artery was normal, and the aorta-coronary bypass grafts to the left anterior descending and circumflex artery were patent.

DISCUSSION

Here we describe a previously unreported anatomic variation of the conus artery. According to a retrospective screening of coronary angiography series, the inci-

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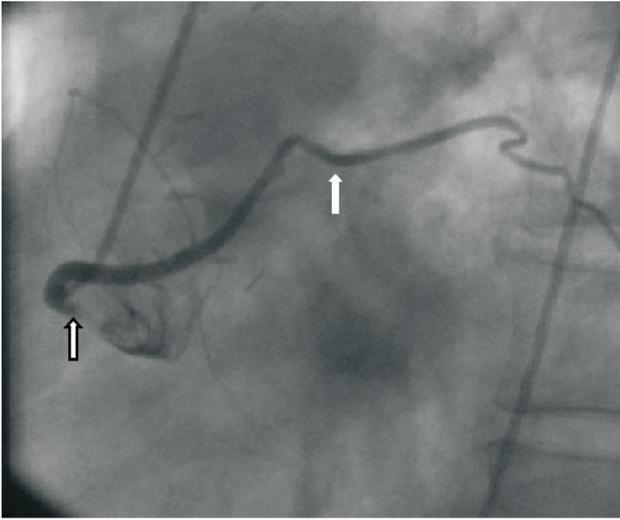


Figure 1. Coronary angiography shows a conus artery (↔) originating from the right sinus of Valsalva (↔).

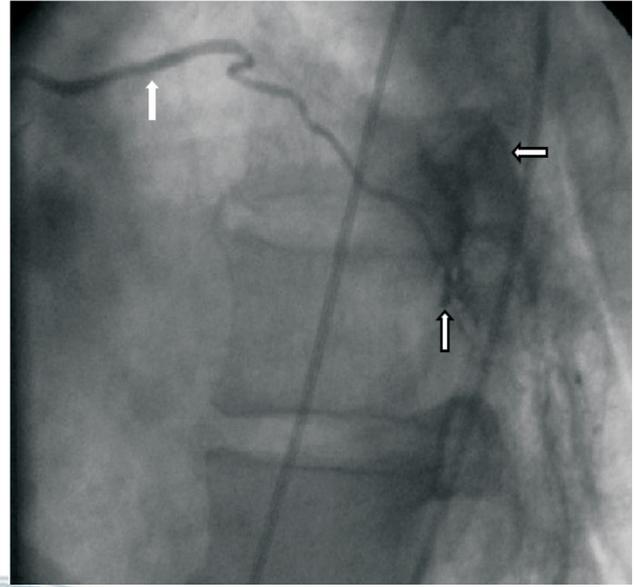


Figure 2. The conus artery (↔) connects to the posterior pericardium with a generalized collateral vessel (↔).

dence of coronary artery anomalies ranges from 0.2-1.2%.^{4,5} The identification of coronary anomalies has clinical importance because it may result in myocardial ischemia, infarction and sudden cardiac death.⁶ The conus artery may arise from the RCA (64%), in proximity with the RCA ostium (22%) or from the anterior aortic sinus (12%).⁷ The conus artery normally supplies coronary blood flow to the conus, the right ventricular outflow tract and a large portion of the anterior free wall of the right ventricle.

In this case, we encountered an unusual anatomic variation of the conus artery terminating in the pericardium. We believe that such an anomaly is herein reported for the first time. This finding has great clinical significance in the interpretation of coronary arteriography and surgical revascularization of myocardium. In the differential diagnosis of such cases, anastomosing with the collaterals of the left bronchial artery should be considered.⁸ Due to the synchronised movement with the heartbeats of an opacified posterior pericardium in the left lateral oblique position, we easily recognized the conus artery communicating with the posterior pericardium. If the opacification was related to respiratory movement, it would be accepted as left bronchial artery. Coronary artery to bronchial fistula usually occurs in chronic pulmonary disease. During surgery it is important to confirm the anomalous artery length, course, and mobility within the surrounding structures in order to avoid vessel injury, which results in post-

operative bleeding and re-operation.

Right ventricle outflow tract and anterior myocardium ischemia may be seen in cases of the conus artery obstruction and atresia due to a decrease in regional coronary blood flow, but left coronary arteries or right coronary artery may serve as collateral. This is in addition to the existence of normal conus artery bridges for collateral circulation between the right and left coronary system which is extremely significant in severe ischemic changes of the heart.⁵

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