

The “Double Whammy” of Inter-arterial and Intracavitary Course of Right Coronary Artery

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A 45-year-old male who had an intermediate pretest probability and had some atypical ECG changes while undergoing the treadmill test was referred for a CT coronary angiogram. The CT angiogram revealed an anomalous origin of the right coronary artery (RCA) from the left coronary sinus. The proximal RCA coursed between the aortic root and the main pulmonary artery (inter-arterial “malignant” course). Kinking and narrowing of the proximal RCA was noted as it passed between the right ventricular outflow tract and the aortic root (Figs. 1 and 2). The distal segment of the RCA showed an intracavitary course for a distance of 2 cm in the right atrial cavity. There were no plaques in the course of any of the coronary arteries.

Majority of the congenital anomalies of coronary arteries are related to their ectopic origins. The other less common anomaly is intracavitary course of a vessel (1). Although intracavitary course of the RCA is clinically silent, but it might pose a great challenge to an unsuspecting interventional cardiologist who might damage the intracavitary portion of the vessel during interventional angioplasties, electrophysiological studies and ablation procedures. The cardiac surgeon also might not be able to localize the intracavitary segment of these vessels at the time of bypass procedure. So, it is very important to know about the existence of such coronary anomalies in order to prevent inadvertent damage to these anomalous coronary arteries.

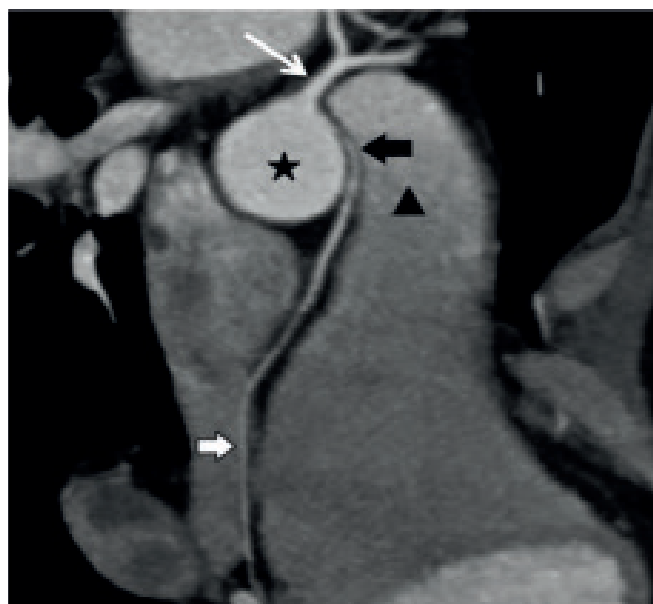


Figure 1. Curved multiplanar reformatted (MPR) image of the right coronary artery (solid black arrow) showing the anomalous origin from the left coronary sinus and the inter-arterial course with narrowing between the aortic root (black star) and the pulmonary artery (black triangle). Also seen is the intracavitary course of the distal RCA (solid white arrow). Left main artery (long white arrow) has a normal origin from the left coronary sinus.

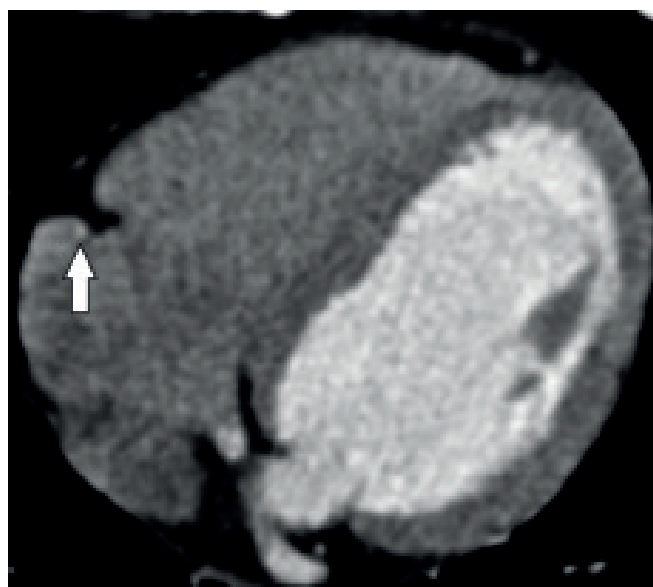


Figure 2. Axial CT angiogram image showing the intracavitary course of the RCA (white arrow) in the right atrial cavity.

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On the other hand, the malignant course (also known as inter-arterial course) of the RCA makes it prone to compression between the root of aorta and the pulmonary artery (2). This is especially true during cardiac stress which leads to an increased heart rate, thereby causing an increased compression effect on the inter-arterial segment caused by the dilated root of aorta and the pulmonary artery. This might precipitate an ischemic cardiac event which may lead to sudden death. The coexistence of malignant and intracavitary course of the RCA not only increases the chances of sudden ischemic cardiac event, but also puts this patient to an increased risk from the treating cardiologist and cardiac surgeon who might advertently damage the intracavitary segment of the artery. To the best of our knowledge,

such coexistence of anomalous origin and an anomalous course has not been described in the literature. The purpose of this report is to make everyone aware about the coexistence of multiple congenital coronary anomalies so that if one encounters an anomaly of origin, the possibility of an anomalous course should always be kept in mind.

References

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