

Right coronary artery arising as a sidebranch from the left anterior descending artery: a single coronary ostium anomaly

Nieprawidłowe odejście prawej tętnicy wieńcowej od gałęzi przedniej zstępującej — rzadka anomalia naczyniowa

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Abstract

We present a patient with abnormal origin of the right coronary artery from the left anterior descending artery. The patient had chest pain probably related to myocardial ischemia. This anomaly is very rare and has only been reported in a few cases. The abnormal vessel had a rightward course following its take-off from the left anterior descending artery and remained anterior to the main pulmonary artery. There was no significant obstruction. The mechanism of myocardial ischemia remains unexplained.

Key words: coronary anomaly, angiography, sudden cardiac death

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INTRODUCTION

An abnormal origin of the right coronary artery from the left anterior descending artery is extremely uncommon and has only been reported in a few cases. In this report, our patient had presented with chest pain and he was evaluated with coronary angiogram and multislice computed tomography (CT) examination. The abnormal right coronary artery had a rightward course following its take-off from the left anterior descending artery and remained anterior to the main pulmonary artery. This anomaly seems 'benign'; however, the medical treatment and lifestyle restriction recommendations for patients with 'benign' coronary anomalies need clarification.

CASE REPORT

A 45 year-old man was referred for evaluation of chest pain that had been present for the previous three months. The pain was intermittent and unrelated to exercise. The patient had a past medical history of diabetes mellitus and

hypertension. His family history included myocardial infarction in his brother. His cardiac examination and ECG were normal. A maximal treadmill exercise test revealed good exercise capacity without any ischaemic ECG changes or provocation of the chest pain. However, based on his risk factors, he was referred for a diagnostic coronary angiogram. This was performed through transradial access. Left coronary artery injection revealed a normal left main coronary artery originating from the left coronary cusp and branching into a left anterior descending (LAD) and a dominant circumflex artery (Figs. 1, 2). An anomalous branch originated from the proximal LAD and traversed to the right side of the heart following the course of a right coronary artery (RCA). The aortogram and selective injections of the right and non-coronary aortic cusp did not reveal any other coronary ostium. His left ventricular systolic function was normal in the ventriculogram. A single coronary artery anomaly with branching of RCA from LAD was diagnosed. The proximal RCA appeared to traverse anterior

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Figure 1. Coronary angiogram in right anterior oblique caudal view revealing the anomalous right coronary artery



Figure 2. Coronary angiogram in left anterior oblique cranial view

to the pulmonary artery, and this was confirmed with a multislice CT examination (Fig. 3). The coronary arteries were free from obstruction, and, given the benign nature of the anomaly, the patient was managed conservatively.

DISCUSSION

A single coronary artery is an extremely rare congenital anomaly: the incidence is between 0.024 and 0.066% in the general population. In these cases, one coronary artery arises

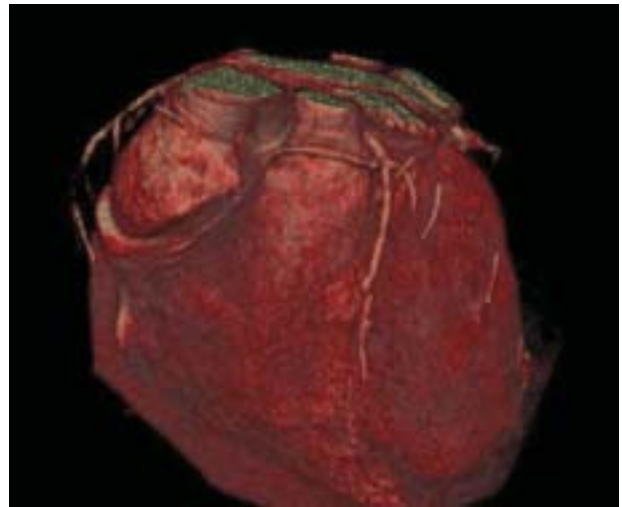


Figure 3. Multislice computed tomography reconstruction image of the heart, demonstrating the relation of the anomalous right coronary artery with the aorta and main pulmonary artery

from a single coronary ostium from the aortic trunk supplies blood to the heart. Many cases are discovered incidentally with conventional coronary angiography, although other diagnostic tests such as multi-slice CT or magnetic resonance imaging can also be used [1]. The prognostic significance is variable, and the majority of patients are asymptomatic. However, 15% of patients with such an anomaly may have myocardial ischemia secondary to the anatomical course of the arteries [2]. A left main coronary artery which originates from the right coronary cusp and travels between the aorta and pulmonary trunk has been associated with sudden cardiac death. In addition, atherosclerosis may develop in these coronary anomalies and necessitate standard revascularisation methods such as coronary angioplasty with stenting or coronary bypass graft [3].

We present a 45 year-old man referred to our cath lab for atypical chest pain. His coronary angiogram revealed a single left coronary artery arising from the left coronary sinus without significant obstruction. The left circumflex artery was very prominent and right coronary artery originated as a side branch from LAD. Lipton et al. [4] classified the single coronary artery anomaly into nine patterns according to the origin and the anatomical course. The clinical case presented here belongs to the L-I pattern, and this particular anomaly has been rarely reported [5]. This anomaly is more benign than right-sided single coronary cases. However, kinking or spasm of the anomalous RCA may cause myocardial ischemia. In addition, atherosclerotic obstruction of the proximal LAD would be extremely dangerous for these patients, since this could cause complete loss of myo-

cardial perfusion and sudden death. There is no clear medical treatment or lifestyle restriction recommendations for patients with 'benign' coronary anomalies. We recommend multislice CT evaluation in young and active patients with unexplained chest pain and syncope, to rule out coronary artery anomalies.

References

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