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CASE REPORT
OLGU SUNUMU

Koroner Ark: Nadir Bir Koruyucu Koroner Arter Anomalisi

Coronary Arcade: A Rare Case Of A Protective Coronary Artery Anomaly

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ÖZET

Koroner arterler arası bağlantı veya koroner ark, iki koroner arter arasında tek yönlü veya iki yönlü akımın olduğu ve açık uçlu dolaşımın bulunduğu nadir görülen bir konjenital koroner arter anomalisidir. 85 yaşında kadın hasta acil serise tipik tarzda göğüs ağrısı ile başvurdu. Elektrokardiyografi ve ekokardiyografisinde transmural miyokard infarktüsü bulguları yoktu. Koroner anjiografide sağ koroner arterin (RCA) tıkalı olduğu ve sol ön inen arter (LAD) arasında bağlantı olduğu saptandı. RCA'da tıkayıcı lezyonun bulunduğu ve LAD ile RCA arasında koronerler arasında bağlantının bulunduğu bu çok nadir görülen koroner anomaliden literatürde sadece iki adet bulunmaktadır. Bu yazıda bu anomalinin aterosklerotik koroner arter hastalığına karşı potansiyel kardiyoprotektif rolü tartışılmıştır.

Anahtar Kelimeler: Koroner arter anomalisi, koroner ark, koronerler arası bağlantı, koroner anjiografi

ABSTRACT

Intercoronary communication or coronary arcade is a rare congenital coronary artery anomaly in which there is an open-ended circulation with unidirectional or bidirectional blood flow between two coronary arteries. A 85-year-old woman was admitted to the emergency service with typical chest pain. There was no evidence of transmural myocardial infarction in the results of electrocardography and echocardiography. An intercoronary connection between the left anterior descending artery (LAD) and the right coronary artery (RCA) with an obstructive lesion was detected on coronary angiography. This is a very rare coronary anomaly, only two cases of intercoronary communication between LAD and RCA with an obstructive lesion were found in the literature. The potential cardioprotective role of this entity against atherosclerotic coronary artery disease is discussed in this case report.

Key Words: Coronary artery anomaly, coronary arcade, communication, coronary angiography

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INTRODUCTION

The incidence of coronary artery anomalies (CAAs) is reported between 0,6 and 1,5% in angiography series (1). Intercoronary communication is a rare coronary artery anomaly with unidirectional or bidirectional blood flow between two coronary arteries (2). The most common intercoronary communication is observed between the right coronary artery (RCA) and circumflex coronary artery (Cx) (3). In this report, we present a case of an intercoronary connection between left anterior descending coronary artery (LAD) and RCA.

CASE

A 85-year-old woman was admitted to our hospital complaining of palpitations and chest pain lasts half an hour accompanied by sweating and nausea. His medical history consisted of hypertension and diabetes mellitus. She was not taking regular medication. In emergency service, blood pressure was 150/90 mmHg, pulse rate was 104 beats/min. Cardiac and respiratory system examinations were normal. Electrocardiography revealed sinus rythm, a heart rate of 92 beats/min and incomplete right bundle branch block. Transthoracic echocardiography revealed no wall motion abnormalities with a normal ejection fraction (65%). On admission, complete blood count, electrolytes and kidney function tests were within normal limits. High- sensitivity troponin T was 16 ng/dl (reference value: 0-14 ng/dl). In follow-up, it rose to 64 ng/dl and then 80 ng/dl. The patient was admitted to the cardiology clinic with diagnosis of non-ST segment elevation myocardial infarction. Anticoagulant, antiplatelet and anti-ischemic therapy was started and the patient underwent coronary angiography using the Judkins method via the right femoral artery in the follow-up period. Selective coronary angiography of the right coronary artery displayed a total occlusion at the proximal portion of the RCA (Figure 1). Left coronary injection showed the LAD in the usual anterograde fashion and resulted in rapid visualization of the RCA. At the apex of the heart LAD passed posteriorly and continued as posterior descending of the RCA (Figure 2). A critical stenosis in the Cx, starting from the middle portion and extending to the distal portion was observed. It was seen that RCA was filling retrograd from the distal LAD via this intercoronary connection. A careful examination showed that retrograd filling was not related to collaterals, but to an intercoronary communication. Percutaneous coronary intervention was unplanned. Chest pain did not reoccur in follow up period, the patient was hemodynamically stable and we did not encounter any complications and patient was discharged 3 days later.

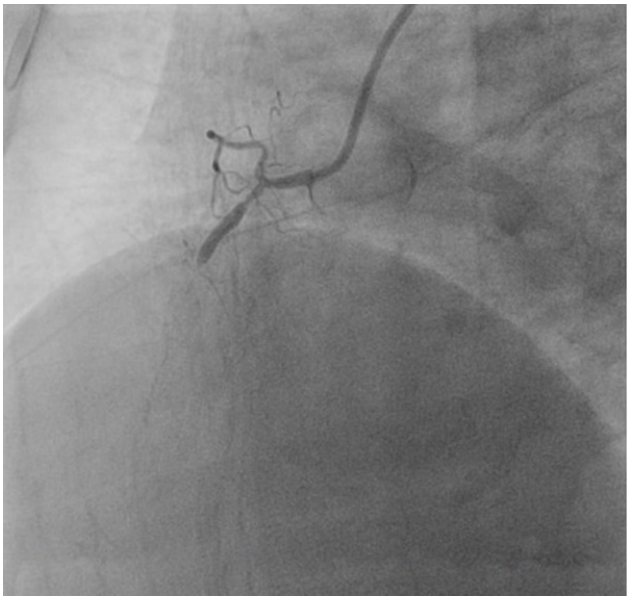

Figure 1. Selective injection of the right coronary artery, demonstrating a total occlusion at its proximal portion.

DISCUSSION

Coronary artery anomalies are uncommon and most of them are found incidentally during coronary angiography. Coronary circulation's anomalies and variants are classified into four main groups; anomalies of origin, distribution, course and termination (1,4). Intercoronary communication or coronary arcade is a very rare coronary artery termination anomaly with unidirectional or bidirectional blood flow between two coronary arteries and is seen during coronary angiography in patients with or without coronary artery stenosis (5,6). The true

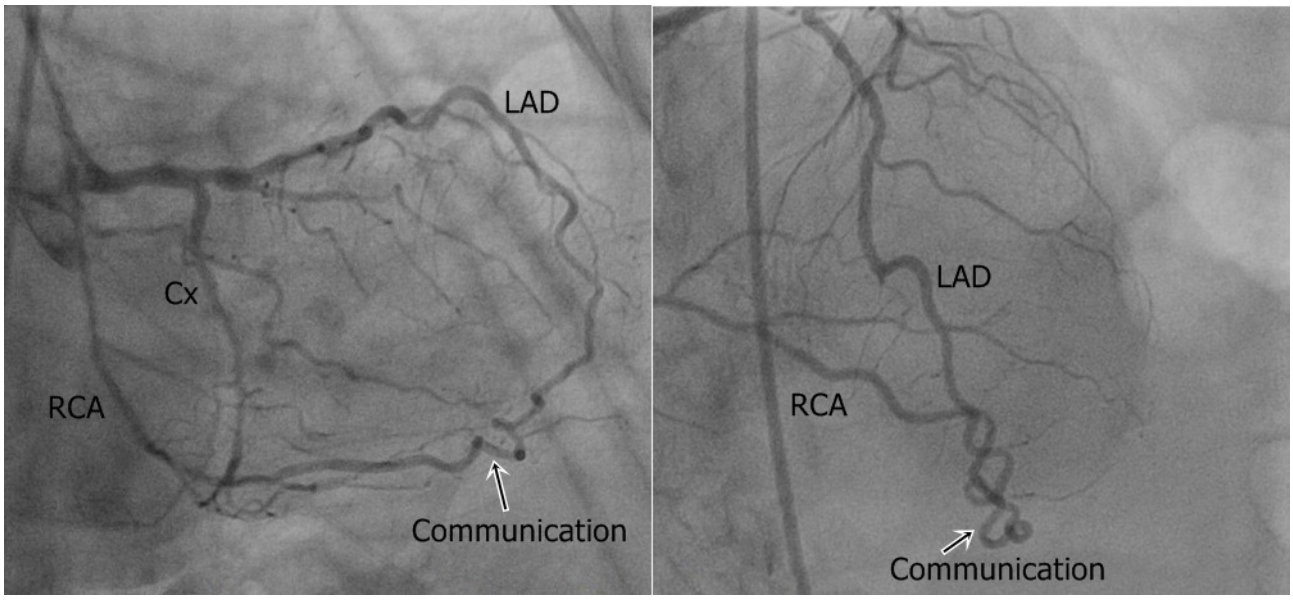

Figure 2. Selective injection of the left anterior descending artery showing no luminal stenosis in the left anterior descending artery (LAD) and demonstrating retrograd filling of the right coronary artery (RCA) via the communication.

incidence of intercoronary communication is unknown. In the largest angiographic review by Yamanaka and Hobbs, the incidence of this entity was reported to be 0.002 % among 126595 cases (7). Arat-Ozkan et al. examined 12.674 coronary angiograhy records and reported one case with intercoronary communication (8). Abreu et al. rewieved ten years angiography record of 9388 patients and identified two cases with intercoronary communication (4). In another study, Carangal and Dehmer identified two cases with intercoronary communication among their last 9726 coronary angiography records (9).

It is suggested that a defective embryological development allows the existing intercoronary channel to remain prominent. The histological structure of the connecting vessel has the characteristic of a normal coronary artery wall so that persistence of the fetal coronary circulation was suggested as the underlying mechanism (5,6). Two types of intercoronary communication have been defined, which are less frequently a communication between LAD and posterior descending artery in the distal portion of the posterior interventricular groove, as described in our case, and a communication between RCA and Cx in the posterior atrioventricular Groove (4,5).

Intercoronary communication should not be confused with collateral circulation. These arterial communications are single, larger in diameter (>1 mm), extramural and straight compared with collaterals. Also, the histological structure of the connecting vessel is similar to an extramural coronary artery with a well-defined muscular layer (5,6). There are contentious thoughts regarding the functional character of this entity. It may play a protective role for myocardium if significant coronary artery stenosis or atherothrombosis develops in one of the two connecting vessels (10). On the other hand, myocardial ischemia can be resulted from a coronary steal, resulting in inadequate perfusion, particulaly when unidirectional flow is observed (2). There were only two cases in the literature similar to our case. Antonellis et al. and Gavrielatos et al. reported intercoronary communications between LAD and RCA with total occlusion of the RCA and no evidence of myocardial infarction and they speculated that even thought open ended circulation pattern prevented myocardial necrosis and preserved cardiac contractility, was not sufficient enough to avert angina (10,11). However, Donaldson and Isner reported a case with >95% stenosis of the RCA with a LAD-posterior descending artery

continuity and evidence of extensive transmural myocardial infarction in the distribution of the posterior descending artery (12). In our case, there was no evidence of transmural myocardial infarction in the results of electrocardography, and echocardiography showed preserved left ventricular systolic function with normal wall motion. There was a minimal increase in cardiac biomarkers. So that coronary angiography was planned and in coronary angiogram, we determined that RCA was occluded and there was a connection between LAD and posterior descending artery. We thought that this connection was not collateral because it was single, straight, extramural and had a diameter greater than 1 mm. So, we thought that this was a coronary arcade between LAD and RCA and this communication might prevent transmural myocardial infarction in the distribution of the RCA in our patient.

In conclusion, intercoronary communication is a very rare and benign clinical entity and may play potentially cardioprotective role against the course of atherosclerotic coronary artery disease.

Conflict of Interest: Authors state no conflict of interest

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