Left Anterior Descending Artery-Pulmonary Artery Fistula

Sol Ön İnen Koroner Arter-Pulmoner Arter Fistülü

ABSTRACT

Despite the fact that coronary arteriovenous fistulas constitute approximately half (48%) of coronary artery anomalies, they are rarely seen anomalies. In this report, we aim to present a coronary arteriovenous fistula case detected during a coronary angiography between left anterior descending artery and pulmonary artery.

Key Words: Coronary Arteriovenous Fistula, Coronary Artery Anomalies, Cardiac Surgery.

ÖZET

Koroner arteriovenöz fistüller, koroner arter anomalilerinin yaklaşık yarısını (% 48) oluşturmalarına rağmen nadir görülen anomalilerdir. Bu yazıda sol ön inen arter ile pulmoner arter arasında koroner anjiografi sırasında saptanan bir koroner arteriyovenöz fistül olgusunu sunmayı amaçladık.

Anahtar Kelimeler: Koroner Arteriyovenöz Fistül, Koroner Arter Anomalileri, Kalp Cerrahisi.

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INTRODUCTION

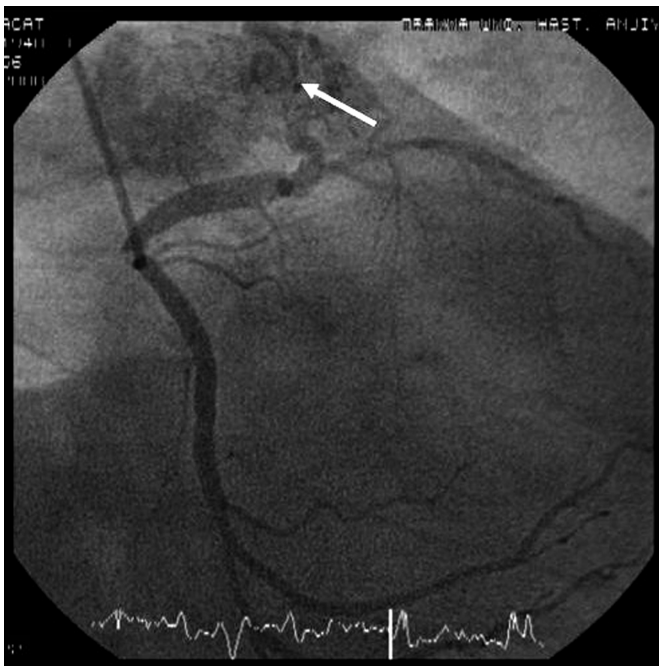
Coronary arteriovenous (AV) fistula is the direct (without a capillary refill) communication between one of the two coronary arteries branching off normally from the aorta or several major coronary artery branches and one of the cardiac cavities or the great vessels of the heart. Coronary artery fistulas are the most commonly seen anomaly among the hemodynamically important congenital coronary artery anomalies (1-3). The fistulous connection between coronary artery and cardiac cavities was first described by Krause (1865), and then Abbott (1906). Left coronary artery, right coronary artery, any coronary artery branch or rarely both coronary arteries together may terminate in the cardiac cavity, pulmonary artery, pulmonary vein, bronchial circulation, coronary sinus or veins and vena cava. Approximately half of the coronary artery fistulas originate from the right coronary artery. Majority of the remaining cases originate from the left coronary artery and about 5% of them originate from both two coronary arteries. Its frequency increases in the presence of coronary artery obstruction. 15-30% of coronary arteriovenous fistulas are between the coronary artery and the pulmonary artery (4). The purpose of this report is to present the case that operated due to AV fistula between the left anterior descending coronary artery and the pulmonary artery.

CASE REPORT

A 66-year-old female patient with a history of hypertension for about 7-8 years and chest pain in the last 1-2 months was hospitalized for unstable angina pectoris. There was nothing in her history other than hypertension. She had a blood pressure of 180/100 mmHg, pulse 86/min, and her cardiac examination revealed rhythmic S1-S2, with an apical 2/6 systolic murmur. Other systemic examinations were normal. In her electrocardiography; she had a sinus rhythm, with a complete left branch block. Echocardiographic examination revealed left ventricle diastolic dysfunction, with an ejection fraction of 70%. Coronary angiography showed a short and normal left main coronary artery (LMCA). She had an ectatic expansion at the proximal left anterior descending coronary artery (LAD), and a fistula between

the first diagonal artery (D1) and pulmonary artery (Figure 1) and 95% critical stenosis at LAD medial segment. Also an ectatic expansion at the proximal of circumflex artery (Cx) and 70% critical stenosis distally to the obtuse margin (OM1) were seen. Right coronary artery (RCAT) was normal.

Figure 1. *Ectatic first diagonal artery drain to the pulmonary artery (white arrow) in the coronary angiography.*



Cardiopulmonary bypass with standard cannulation was performed followed by median sternotomy. A fistula about 2x0,2 cm was seen between LAD and the pulmonary artery. Proximal and distal ends of fistula was ligated using 5/0 polypropylene suture (Ethicon, Somerville, New Jersey, USA). Distal bypasses was performed to OM1 by saphenous vein and to LAD by the left internal mammarian artery (LIMA). Upon completion of the proximal anastomoses, weaning of cardiopulmonary bypass achieved without any problem. Cross clamping time: 35/min, total cardiopulmonary bypass time: 70/dk and temperature was 35^{o} C. The AV fistula flow measured by intraoperative epicardial Doppler device (MediStim VeriQ-1111, MediStim SAA, Oslo, Norway) was 53 ml/min. The patient had no problems during the postoperative period and was discharged on the 7th postoperative day. No ischemic or hemodynamic changes were encountered in controls.

DISCUSSION

Coronary artery fistulas are rarely seen congenital anomalies but could result in cardiac complications. Coronary artery fistulas are asymptomatic in most of the cases (5,6). Many cases are detected during coronary angiography or echocardiographic examination. Clinical measures of asymptomatic coronary artery fistulas which detected spontaneously during the coronary angiography are unknown (5,7). The incidence varies between 0,1%-0,26% in angiography series (8,9). In this case, a coronary artery fistula was detected spontaneously, who underwent coronary angiography due to coronary arterial disease.

Coronary artery fistulas mostly originate from right coronary artery and frequently open out to right cardiac cavities. While the pulmonary artery fistula rate is 17% in fistulas originating from a single coronary artery, this ratio reaches to 50% in bilateral coronary artery fistulas (10). This case had a fistula originating from left coronary artery and draining from the D1 branch to the pulmonary artery.

Hemodynamically important fistulas may cause complaints like effort dyspnea, symptoms of cardiac failure (as a result of volume overload of cardiac cavities), angina (as a result of coronary steal or imbalance of myocardial O2 consumption), palpitation and fatigue. Coronary artery disease symptoms were mostly seen in this case. No continuous murmur which is a physical examination finding of the coronary fistula was examined.

Pulmonary hypertension, congestive cardiac failure, sudden death, bacterial endocarditis, rupture, coronary thrombosis, arterial aneurysm and myocardial ischemia are potential complications (6). Studies reveal an increase in the possibility of symptom and fistula associated complications in the advanced-age group, and an opinion has arisen for the closure of fistulas even in asymptomatic cases by early intervention (2). Despite the fact that this case had no symptoms and complications, coronary fistula was closed during the operation. However, it should also be in mind that some fistulas closed spontaneously in the follow-up, and it has been stated that they can be followed by non-invasive methods particularly in asymptomatic children and young adults (11).

Although coronary artery fistulas are uncommonly seen, an ever-increasing use of cardiac characterization ensures higher detection of these anomalies (12). Despite an increase in the transcatheter coagulation treatment in the recent years, closure of coronary arteriovenous fistulas surgically by epicardial and endocardial ligation is made in a safe, effective and successful manner (13). As a result, we conclude that coronary artery fistulas have to be closed even if the patient is asymptomatic because there is an increase in the rate of complications, morbidity and mortality by the increasing age.

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