Case Report

Dual Fistula Originating from Left Anterior Descending Coronary Artery; Off-Pump Surgical Closure Technique

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Abstract

The incidence of multiple fistulas within all coronary arteriovenous fistulas varies between 10.7% and 16%. Double coronary arteriovenous fistulas originating from a coronary artery are much less common. In this study, we present a double fistula originating from left anterior descending coronary artery and communicating with main pulmonary artery.

A 72-year-old female patient was admitted to our clinic with complaints of chest pain and shortness of breath with progressive exertion. Coronary angiography revealed the presence of a double fistula originating from the LAD and a major pulmonary arterial drainage. From the LAD proximal segment, two A-V fistulas with fragile tissue at the origin and connecting to the mid portion of the main pulmonary artery were identified. LAD exit site - pulmonary arterial entry site identified. Exit locations and access sites were ligated with 5.0 prolene. No electrocardiographic and hemodynamic changes were detected. Several other vascular structures on the pulmonary artery were separately sutured.

INTRODUCTION

Coronary arterio-venous malformations are rare. They are mostly of congenital origin. They originate from embryogenic intertrabecular spaces and sinusoids between the heart chambers and the coronary circulatory system [1,2].

Acquired arterial-venous malformation is likely to occur. Although coronary artery fistulas are rare, they present a significant risk for myocardial ischemia, myocardial dysfunction, heart failure and infective endocarditis [3,4].

The incidence of multiple fistulas within all coronary arteriovenous fistulas varies between 10.7% and 16%. On the other hand, the incidence of arteriovenous fistula originating from two coronary arteries was 5% [5,6].

Double coronary-arteriovenous fistulas originating from a coronary artery are much less common. In this study, we present a double fistula originating from left anterior descending coronary artery (LAD) draining to main pulmonary artery.

CASE PRESENTATION

A 72-year-old female patient was admitted to our clinic with complaints of chest pain and shortness of breath with progressive exertion. On auscultation, a murmur of 2/6 intensity, which is continuous in the anterior mediastinum, was detected. No pathology was detected in the telegraphy and electrocardiogram. Findings of anterior ischemia were detected by the Treadmill effort test.

Transthoracic echocardiography revealed the presence of a continuous flow on the main pulmonary artery. Coronary angiography revealed the presence of a double fistula originating from the LAD and a major pulmonary arterial drainage (Figure 1). Arterial blood gas analysis, there was a 10% saturation difference between the right ventricle and the pulmonary artery.

Lady was admitted to our clinic for surgical reasons for the detection of pulmonary arterial high-flow double a-v fistulae. At another center, attempted coil embolisation failed (Figure 2). After necessary surgical preparations, the patient was operated.
Median sternotomy was performed. Pericardium was opened and suspended. From the LAD proximal segment, two curve A-V fistulas with fragile tissue at the origin and mid region of the main pulmonary artery were identified.

LAD exit site - pulmonary arterial entry site identified. Exit locations and access sites were ligation with 5.0 prolen. All A-V fistula strains were ligated with over and over suture technique. No electrocardiographic and hemodynamic changes were detected. Several vascular structures on the pulmonary artery were separately sutured (Figure 3). In the ABG analysis after the ligation procedure, there was no difference in oxygen saturation between the right ventricle and the pulmonary artery.

On the fourth postoperative day the patient was discharged without any problems. There was no murmur on auscultation. Echocardiographic examination revealed that the current on the main pulmonary artery disappeared. At a follow up of 3 months, the patient is asymptomatic.

**DISCUSSION**

Coronary A-V fistulas are treated with various techniques. Patients with symptomatic and prominent A-V appendages may be surgically closed if they are not suitable for percutaneous closure. Ligation of the fistula under cardiopulmonary bypass is the simplest surgical procedure.

Coronary artery fistulas are rare pathologies. Arteriovenous fistulas of coronary arteries are seen in 1-2%. The incidence of arteriovenous fistula according to outflow is 50-58% in the right coronary artery, 25% in the left anterior descending artery, 18.3% in the circumflex artery, 1.9% in the diagonal artery and 0.7% in the left main coronary artery [8,9].

The incidence of multiple fistulas within all coronary arteriovenous fistulas vary between 10.7% and 16%. In contrast, the rate of arteriovenous fistula originating from two coronary arteries is 5% [3,4]. While bilateral fistulae end in 56% of the pulmonary arteries, 17% of the single arteriovenous fistulas terminate in the pulmonary artery [3].

Different types of arterio-venous fistulae are described in the literature. If this case is different, two separate fistulae from single coronary artery have emerged. This is extremely rare. Coronary arteriovenous fistulas are rare, difficult to detect, may be associated with other coronary artery anomalies and are usually congenital [2,3,5].

Acquired coronary fistulas are caused by atherosclerosis, tachycardia and trauma [6,8,10]. In addition, 20% of patients with congenital coronary arteriovenous fistulas have another congenital or acquired heart disease [1,2,4].

Treatment in asymptomatic adults and nonspecific shunts is controversial. Successful results of catheter closure of the fistula have been reported [9,10]. However, as in this case, it is not possible to close each case percutaneously. In this case, both fistulas originated from the same coronary artery, and the procedure was unsuccessful due to their anatomic position.

It would be appropriate to safely transfer such cases to surgical clinics. It will be the right choice to decide which surgical method to choose according to the clinical experience of the surgical team, the accompanying pathologies and whether or not it is complex.

**CONCLUSIONS**

It is possible and preferable to safely close the fistula in the heart with off pump technique in patients which are not complex and have no accompanying cardiac pathologies.
REFERENCES


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