

## CORONARY A-V FISTULA IN ADULTHOOD (Case Report)

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**SUMMARY :** *In this study, we present a patient having a fistula from left anterior descending coronary artery to pulmonary artery leading to successful surgical repair.*

*We also reviewed the current literature and discussed the diagnostic and management strategies in this very rare coronary anomaly.*

**Key Words :** *Coronary Vessel - Anomalies, Myocardial Revascularization.*

### INTRODUCTION

Since Krause first described a coronary fistula in 1865, almost 400 additional patients with this malformation have been reported in the literature (5). Increasing numbers of patients with this anomaly are being recognized each year because of the widespread use of cardiac catheterization and selective coronary arteriography as well as doppler echocardiography in the evaluation of various cardiac problems.

Coronary artery fistulas are found in 1 of every 50000 patients with congenital heart diseases and 1 of every 500 patients who have coronary arteriography (7).

In this paper, we present a patient in whom coronary angiography and radionuclide imaging procedures were effective in determining the degree of coronary steal from a coronary artery fistula diagnosed coincidentally; leading to successful corrective surgery.

### CASE REPORT

A 51 year old male was referred to cardiology clinic for the management of chest pain of recent onset. The history indicated a chest discomfort beginning only 5 months ago and hypertension for the last 15 years requiring anti-hypertensive therapy. Physical examination was completely normal. The patient was in Class IIa according to NYHA Classification. Chest X-ray showed an enlarged heart. The pattern of ECG demonstrated inferior myocardial infarction. Blood and urine biochemistry and haemograms were all in normal range.

Doppler echocardiography indicated apical pypokinesia (Table 1) (Fig 1). Treadmill test was negative.

Thallium-201 (Tl-201) test and Tc-99m methoxy isobutyl isonitrile (MIBI) stress (Dual isotope perfusion scintigraphy) Single Photon Emission Computed Tomography (SPECT) revealed reversible anterior and fixed inferior perfusion defects.

- Inferior and posterior hypokinesia
- Fractional Shortening : 30 %
- Ejection Fraction : 58 %
- Left Ventricular End Diastolic Diameter : 54 mm
- Left Ventricular End Systolic Diameter : 38 m

Table 1 : Doppler echocardiographic evaluation of the patient.

- Oxygen Saturation: Pulmonary Artery= Right Ventricle = Right Atrium.
- Left Ventricle End Diastolic Pressure : 10 mmHg
- Left Anterior Descending Coronary Artery - Pulmonary Artery Fistula
- Right Coronary Artery Stenosis : 100 %

Table 2 : Coronary angiographic data of the patient.

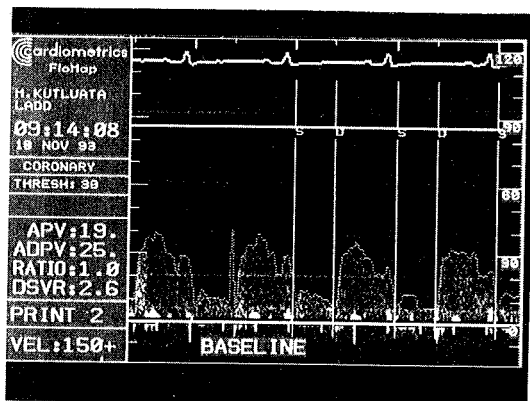


Fig - 1 : Preoperative doppler echocardiographic evaluation of the patient.



Fig - 2 : Preoperative coronary arteriography of the patient demonstrating fistula.

After these noninvasive tests, the patient was examined by cardiac catheterization and coronary angiography.

The oxygen saturations were approximately equal in right atrium, right ventricle and pulmonary artery. Coronary arteriography revealed a fistula from Left Anterior Descending Coronary Artery (LAD) to pulmonary artery (Table 2 and Fig 2).

The patient was then considered for elective surgical correction to prevent possible complications including development of congestive heart failure, angina, subacute bacterial endocarditis, myocardial infarction or coronary aneurysm formation with rupture or embolization.

After the institution of standard cardiopulmonary bypass (CPB), the diagnosis of the fistula from LAD to pulmonary artery was confirmed. The fistula was then closed by interrupted mattress prolene sutures with teflon pledgets plus ligation of the terminal portion of the coronary artery near the fistula.

Coronary artery bypass grafting with a saphenous vein graft was performed for right coronary artery in beating heart.

The operation was then finished on standard procedure.

The early postoperative follow - up was uneventful (Table 3). Control coronary angiography was performed and closed fistula as well as saphenous bypass graft on right coronary artery were demonstrated (Fig 3).

Tl-201 rest Tc-99m MIBI stress, radionuclide control imaging indicated better anterior and inferior perfusion.

The following controls on third and sixth months were normal. The patient improved to be in Class I according to NYHA Classification in the third month control.

- Inotropic support : None
- Respiratory support : 6 hours
- Hemorrhage : 350 cc / 24 hours
- Arrhythmia, hypotension : None
- NYHA (7th day) : 2a
- Hospital stay : 7 days

Table 3 : Early postoperative follow - up of the patient.

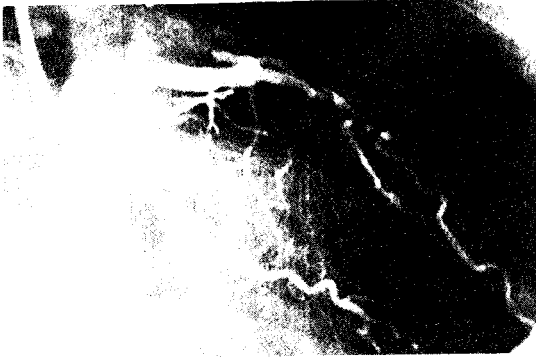


Fig - 3 : Postoperative control coronary arteriography of the patient

## DISCUSSION

Coronary AV fistula is an uncommon clinical entity. The most common coronary artery fistula is from right coronary artery to right side of the heart and it is less frequent to the pulmonary artery (4). The effect of a coronary artery fistula may be physiologically significant because of the steal phenomenon resulting in coronary ischemia (1).

The most important point is that most coronary anomalies do not result in signs, symptoms or complications and usually are discovered as incidental findings at the time of catheterization just like our case.

Topaz et al. studied 13010 adults who underwent coronary angiography and diagnosed 80 patients having a total of 83 coronary anomalies. 23 patients had concomitant congenital heart anomalies, most commonly bicuspid aort valve and mitral valve prolapse. In only 6 % of these patients, the anomalous coronary artery was solely responsible for the clinical event (6).

A review of 1097 consecutive coronary angiograms performed for evaluation of angina pectoris or valvular dysfunction showed only 3 patients with coronary AV fistulas (0.25 %) (9).

From the National Heart, Lung and Blood Institute Multicenter Coronary Artery Surgery Study (CASS), detailed coding of coronary angiograms was available in 24959 patients. Of these patients, 73 (0.3 %) had major coronary anomalies and the most common anomaly involved was the circumflex artery (60 %) (2).

Coronary artery anomalies were found in 1686 patients (1.3 % incidence) undergoing coronary arteriography at the Cleveland Clinic Foundation from 1960 to 1988. Of these 1686 patients, only 225 had coronary artery fistulae (8).

Fukushima demonstrated successful diagnosis of coronary AV fistula with intraoperative echocardiography. Although no fistula was noted on cardiac surface during operation, the intraoperative echocardiography was performed and the fistula pouring into the right ventricle as well as closure of the fistula could be checked with the intraoperative echocardiography (3).

The successful surgical management of the patients with coronary artery fistula depends on a thorough preoperative evaluation that precisely defines the anatomy and pathophysiology of the anomaly.

Although echocardiography have been used to identify coronary fistulas, the precise diagnosis requires arteriographic demonstration of the involved coronary artery, the recipient cardiac chamber and the exact size of the communication.

It is commonly believed that most patients with coronary AV fistulas are asymptomatic. However, complications and especially congestive heart failure may actually appear very early.

The case we presented, is interesting, since he is 51 years old without having any complaints or symptoms for years. We also tried to review the literature for diagnostic and prognostic modalities.

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