Medical Journal of the
Islamic Republic of Iran

Volume 2, Number 2
Tabestan 1367
Zelghadeh 1408
Summer 1988

Case Reports

CORONARY ARTERIOSYSTEMIC FISTULA

M. POURMOGHADDAS, M.D. AND M.A. SADR-AMELI, M.D.

From the Shahid Rajai Heart Hospital, Iran University of Medical Sciences, Tehran, Islamic Republic of Iran.

ABSTRACT

Coronary arteriosystemic fistula which drains into the left ventricular cavity is a rare congenital anomaly. A case of double fistulae between the left anterior descending and left circumflex coronary arteries and left ventricular cavity is presented. The patient's chief complaint, chest pain, was attributable to the "steal phenomenon."
MJIRI, Vol.2, No.2, 139-141, 1988

INTRODUCTION

Congenital coronary arterial fistulae are the most prevalent hemodynamically significant congenital malformations of the coronary artery.[1]

Left coronary arterial fistulae are less common than right[2] and drainage into the left ventricular (LV) cavity composes only three percent of the cases.[3] This case, who was admitted for evaluation of chest pain, revealed ischemia during ^{201} thallium-exercise testing, and in coronary angiography double fistulae between the left anterior descending (LAD) and left circumflex (LCX) coronary arteries and the LV cavity were detected.

CASE REPORT

A 47 year old man was referred for evaluation of chest pain and palpitation on moderate to severe exertion. These symptoms had begun from five years ago with no significant progression or deterioration. No history of trauma was elucidated.

There were no risk factors for coronary artery disease (CAD). On physical examination, no abnormal finding was seen and no murmur was detected on cardiac auscultation. The electrocardiogram showed right bundle branch block (RBBB), and the chest roentgenogram was normal. The echocardiogram (M-Mode, 2-D, and Doppler) showed mitral valve pro-

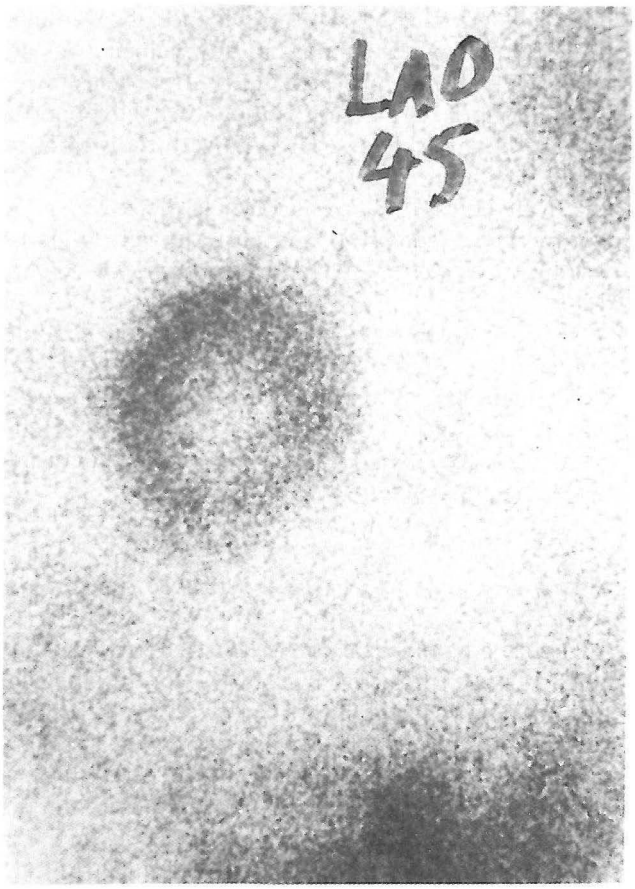

Figure 1. ^{201} Thallium-exercise test shows hypoperfusion of the anterolateral LV wall.

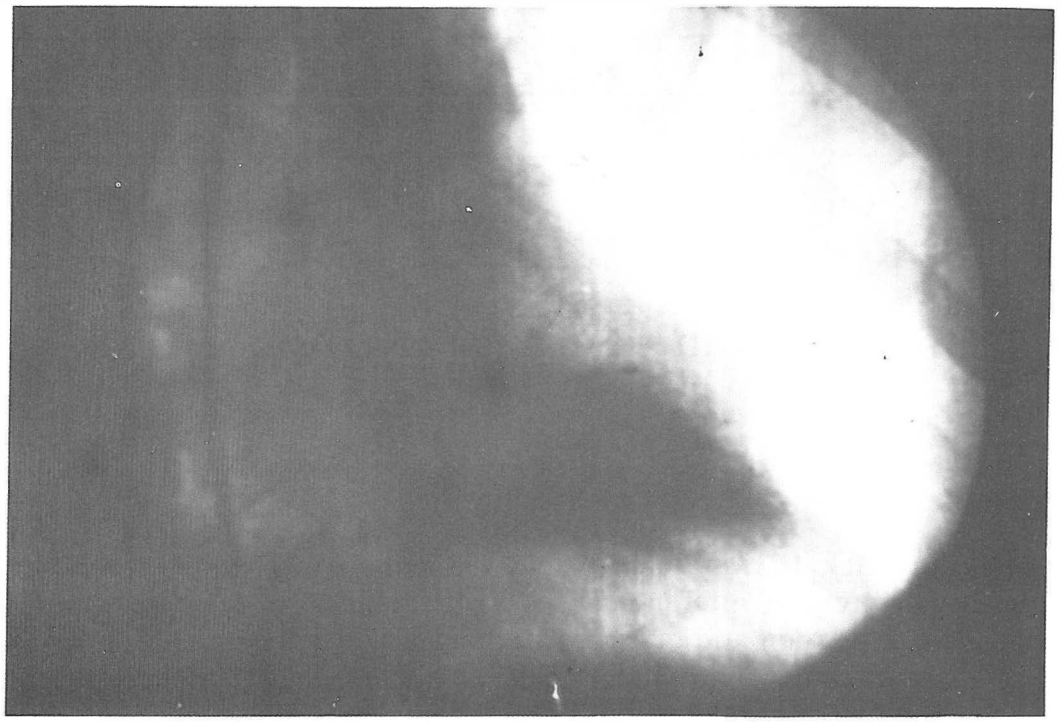

Figure 2. LV angiogram demonstrates mitral valve prolapse.

lapse (posterior leaflet) with no evidence of LV volume overload pattern. No abnormal flow velocity was detected by Doppler. The^{201} thallium-stress test showed no S-T segment depression, but did reveal hypoperfusion of the anterolateral LV wall with redistribution four hours later (Figure 1).

LV angiography revealed normal LV size with good contractility. Prolapse of the posterior mitral leaflet was again obvious in RAO injection of the LV (Figure 2).

Selective coronary angiography showed fistulous drainage of the LAD and LCX into the LV cavity. As depicted in Figure 3, there is opacification of the LAD and LCX regions during left coronary injection. Right coronary artery (RCA) and aortic root injection revealed no abnormality.

DISCUSSION

Approximately half of coronary arterial fistulae (CAF) arise from the right coronary artery,[1] somewhat less than half from the left coronary artery,[4] and a distinct minority (five percent) from both coronary arteries.[5] More than 90 percent of CAF drain into the right side of the heart.[6] A substantial majority enter the right ventricle (40 percent) or right atrium (25 percent),[7] and less commonly, the pulmonary trunk (15 percent)[8] or the coronary sinus (7 percent),[9] and most rarely the superior vena cava (one percent).[6] The relatively few that do not communicate with the right side of the heart drain into the left atrium (5 percent)[10] or LV (3 percent).[4,10]

There are CAF that exist without clinical evidence of their presence and that are incidentally discovered during diagnostic coronary angiography.[11]

A number of reports call attention to myocardial ischemia as a sequel to CAF.[3,12,13] The fistula is believed to act as a low-resistance pathway diverting blood from other coronary arteries into the fistulous channel, and the term coronary steal has been applied. Our patient characteristically showed this ischemia on the ^{201} thallium-stress test with redistribution of the low perfused anterolateral LV wall after four hours. A continuous murmur that is distinctly louder in either systole or diastole brings the patient to medical attention in half of the cases. When the communication joins the LV, a diastolic decrescendo murmur may occur alone.[14] In this situation, the pulse pressure may increase and the LV is the only palpable precordial impulse. CAF without murmurs may occur under one of these situations:

- Firstly, with Thebesian venous connections (intramyocardial The besian venous channels that arise in the muscular walls of the heart).[12,15] The lack of murmur in our patient is probably due to this condition.
- Secondly, when there is multiple small or plexiform connections with the pulmonary arterial system.
- Thirdly, after spontaneous closure of the fistula.

Figure 3. Left coronary angiography in the LAO position shows fistulous drainage of the LAD and LCX into the LV cavity. Because of RBBB, a pacemaker was inserted during LV and coronary angiography.

REFERENCES

1- Hobbs R E, Millit H D, Raghavan P V et al: Coronary artery fistulae: a 10 year review. Cleve Clin Q 49: 191, 1982.

2- Levin D C, Fellows K E, Abrams H L: Hemodynamically significant primary anomalies of the coronary arteries. Angiographic aspects. Circulation 58 (1): 25-34, 1975.

3- Brooks C H, Bates P D: Coronary artery-left ventricular fistula with angina pectoris. Am Heart J 106 (2): 404-6, 1983.

4- De Nef J J, Varghese P J, Losekoot G: Congenital coronary artery fistula: report of 17 cases with a note on natural history of lesion. Br Heart J 33: 150, 1971.

5- Humblet L, Delvigne J, Kulbertus H, et al: Arteriovenous fistula involving both coronary arteries and main pulmonary artery. Brit Heart J 31: 136-9, 1969.

6- Edis A J, Schattenberg T T, Feldt R H, et al: Congenital coronary artery fistula. Surgical considerations and results of operation. Mayo Clin Proc 47: 567-71, 1972.

7- Gasul BM, Arcilla R A, Fell E H, et al: Congenital coronary arteriovenous fistula. Clinical, phonocardiographic, angiocardiographic and hemodynamic studies in five patients. Pediatrics 25: 531-60, 1960.

8- Neufeld H N, Lester R G, Adams P Jr, et al: Congenital communication of a coronary artery with a cardiac chamber or the pulmonary trunk («coronary artery fistula»). Circulation 24: 171-9, 1961.

9- Kimbiris D, Kasparian H, Knibb E P, Brest AN: Coronary artery-coronary sinus fistula. Am J Cardiol 26: 532-9, 1970.

10- Arani D T, Greene D G, Klocke F J: Coronary artery fistulas emptying into left heart chambers. Am Heart J. 96 (4): 438-44, 1978.

11- Iskandarian A S, Kimbiris D, Bemis CE, Segal BL: Coronary artery to pulmonary artery fistulas. Am Heart J 96 (5): 605-9, 1978.

12- Ahmed S S, Haider B, Regan T J: Silent left coronary artery-cameral fistula: probable cause of myocardial ischemia. Am Heart J 104 (4): 869-70, 1982.

13- Cheng T O: Left coronary artery-to-left ventricular fistula: demonstration of coronary steal phenomenon. Am Heart J 104 (4): 870-2, 1982.

14- Dobell A R C, Long R W: Right coronary-left ventricular fistula mimicking aortic valve insufficiency in infancy. J Thorac Cardiovasc Surg 82 (5): 785-9, 1981.

15- Cha S D, Singer E, Maranhao V, Goldberg H: Silent coronary artery-left ventricular fistula: a disorder of the Thebesian system. Angiology 29 (2): 169-73, 1978.

16- Oldham M N, Ebert P A, Young W G, et al: Surgical management of congenital coronary artery fistula. Ann Thorac Surg 12: 503, 1971.