Coronary arteriovenous fistula between left circumflex artery and superior vena cava

Sanjeev Kumar Khulbey*, Sanjay Agarwal and Vijay Dikshit

Department of Cardiothoracic Surgery, Apollo Hospital, Hyderabad, India

* Corresponding author. Department of Cardiothoracic Surgery, Apollo Hospital, Jubilee Hills, Hyderabad, India. Tel: +91-4023548932; fax: +91-4023548932; e-mail: khulbeycvts@yahoo.co.in (S.K. Khulbey).

Received 27 January 2015; received in revised form 8 April 2015; accepted 17 April 2015

Abstract

A 52-year old man presented with exertional angina and shortness of breath and was diagnosed with double-vessel coronary artery disease with a large coronary artery fistula between the left circumflex artery and superior vena cava. He was managed with off-pump coronary artery bypass grafting with closure of the fistula.

Keyword: Coronary fistula

INTRODUCTION

Coronary arteriovenous fistula (CAVF) is a rare anomaly which consists of abnormal communication between the coronary artery and cardiac chamber or great vessels adjacent to the heart. CAVF is present in 0.002% of the population and comprises 0.31% of all congenital heart defects. The majority of these cases are asymptomatic. Some may present with angina and/or symptoms of heart failure. We report a case with angina and shortness of breath. A clinical evaluation was apparently normal. A coronary angiogram suggested double vessel disease with CAVF between the left circumflex artery (LCx) and superior vena cava (SVC). This type of abnormal communication is uncommonly seen in the literature.

CASE REPORT

A 52-year old diabetic and hypertensive man was admitted with an episode of angina, nausea and exertional shortness of breath. On clinical examination no significant abnormality was noted. An electrocardiogram showed non-ST segment elevation myocardial infarction; hence, Gp2b/3a inhibitors were started. A 2D echocardiogram was suggestive of no left ventricular (LV) regional wall abnormalities, concentric LV hypertrophy with good LV function, and Grade 1 diastolic dysfunction with no mitral regurgitation/tricuspid regurgitation/aortic regurgitation. A coronary angiogram revealed discrete 90% stenosis in the proximal left anterior descending artery (LAD) with tubular 70–80% stenosis in mid-LAD, with 90% in the proximal right coronary artery (RCA). Along with this, in the late phase it showed a large CAVF from the LCx draining into the right atrium. On further evaluation with 64-slice multidetector computed tomography (CT), a large fistula between the LCx and SVC (11 mm in maximum diameter) was seen following the course of the left sinoatrial nodal artery. The fistula showed tandem intimal calcification with mild luminal irregularity. Obtuse marginals were absolutely normal in size and course (Fig. 1).

After evaluation, he underwent off-pump coronary artery bypass grafting (CABG; left internal mammary artery to D1 and LAD sequentially and right internal mammary artery to distal RCA) and closure of CAVF. Perioperatively, a large fistula was seen arising from the LCx with a tortuous course draining into the SVC. Scattered calcification with feeble thrill was felt over the fistula. The fistula tract was explored near the SVC and doubly ligated and transfixed (Fig. 2). This was followed by off-pump CABG with three grafts. The rest of the procedure was uneventful. He was moved to our cardiothoracic intensive care unit with minimal ionotropic support. He was extubated later the same day and discharged uneventfully on the seventh post-operative day.

DISCUSSION

CAVF is a rare anomaly, first described by Krause in 1865, which was first surgically treated by Bjork and Crafoord in 1947 [1].

The majority of CAVFs have a congenital origin but may be seen after cardiac surgeries such as CABG [2], valve replacement and after myocardial biopsy post-cardiac transplant.

The fistula arises from the main coronary artery or its epicardial branch, terminating into one of the cardiac chambers or a vessel. The majority of these arise from the RCA and, less commonly, from LAD; the LCx is rarely involved. The fistula terminates to the right side of the heart in the majority of cases: it drains in the right ventricle in 40%, right atrium in 26%, pulmonary artery in 17%, LV in 3%, coronary sinus in 7% and SVC in 1% [3]. To date, only 1 case has been reported with CAVF from LCx to SVC [4].
The majority of patients remain asymptomatic but occasionally present with dysfunction, fatigue and angina. A patient may also present with heart failure, endocarditis, myocardial ischaemia, rupture or thrombosis of fistula [5].

The main diagnostic test is cardiac catheterization with coronary angiogram. However, detailed anatomy of a fistula cannot be revealed by selective coronary angiogram. In such cases, a CT coronary angiogram provides further detail.

The management options for CAVF include surgical or transcatheter closure of the fistula. Surgical closure involves internal closure of the fistula within the draining chamber or vessel. In our case, we performed double ligation and transfixation of the fistula close to the SVC on a beating heart. Careful dissection and isolation of the fistula was required at the termination point before final ligation test clamping and successive tightening of the ligature was done. This procedure was followed by off-pump grafting to LAD, D1 and RCA.

CONCLUSION

Closure of CAVF on a beating heart can be performed with off-pump CABG. Test clamping and successive tightening of the ligature around the fistula gives a result comparable with opening a chamber or vessel on bypass for fistula closure.

REFERENCES