

Case Report

Percutaneous Occlusion of Acquired Aorto-Coronary Venous Fistula After Coronary Artery Bypass Graft Surgery: Initial Experience Using the Self-Expandable Nitinol Vascular Plug

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ABSTRACT

Inadequate anastomosis of aorto-coronary grafts to the coronary venous system represents an infrequent but potentially serious complication of coronary artery bypass surgery. Different surgical techniques and percutaneous devices have been described for the permanent correction of these fistulas. We report two cases of iatrogenic aorto-coronary fistulas successfully treated with percutaneous occlusion using the self-expandable nitinol device (vascular plug).

DESCRIPTORS: Arteriovenous fistula. Myocardial revascularization. Iatrogenic disease. Percutaneous coronary intervention.

Coronary fistulas are rare congenital or acquired conditions that may determine high output heart failure, pulmonary arterial hypertension or myocardial ischemia, secondary to left-right shunt or the "coronary theft" phenomenon.¹

While an initial period of observation in asymptomatic patients has been the rule, the presence of symptoms or progressive increase in size of these anomalous connections determine the need for intervention – percutaneous or surgical.²⁻⁴

We report our initial experience of percutaneous embolization of arteriovenous fistulas (AVFs) acquired after coronary-artery bypass graft (CABG), using a

RESUMO

Oclusão Percutânea de Fístula Aorto-Coronária Venosa Adquirida Após Revascularização Miocárdica: Experiência Inicial com Plug Vascular Autoexpansível de Nitinol

Enxertos aorto-coronários anastomosados inapropriadamente no sistema venoso representam complicação infrequente, porém potencialmente grave, das cirurgias de revascularização miocárdica. Técnicas cirúrgicas e dispositivos percutâneos diversos têm sido descritos para a correção definitiva dessas fístulas. Relatamos aqui dois casos de fístulas aorto-coronárias iatrogênicas submetidas à oclusão percutânea com sucesso, utilizando-se dispositivo autoexpansível de nitinol (*plug vascular*).

DESCRIPTORES: Fístula arteriovenosa. Revascularização miocárdica. Doença iatrogênica. Intervenção coronária percutânea.

self-expandable nitinol vascular occluder in two patients that presented with persistent angina symptoms after complete myocardial revascularization and optimal drug therapy.

CASE REPORTS

Case 1

Female patient, 65 years-old, with a history of type 2 diabetes *mellitus*, hypertension and chronic coronary artery disease (CABG performed in 2011), admitted in April 2013 due to acute coronary syndrome of intermediate risk (GRACE score: 96). Serial electrocardiograms showed regular sinus rhythm and

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no alterations consistent with acute ischemia; markers of myocardial necrosis were negative. Two-dimensional transthoracic echocardiography showed slight dilation of the right atrium and moderate in the left. The left ventricle showed small dilatation and slight reduction in the overall systolic function with due to anterior septal hypokinesia (mid-basal segment). The ejection fraction (Simpson) was 0.53 and systolic pulmonary artery pressure was 24 mmHg.

The coronary angiography showed a dilated saphenous vein graft connected to the great cardiac vein, with significant dilation of the coronary sinus (Figure 1A).

Coronary angiography confirmed the presence of the saphenous vein connection with the great cardiac vein, with additional evidence of segmental and severe obstructive lesion in the mid-third of the nonrevascularized left circumflex artery (Figure 1B). We chose to perform a percutaneous coronary intervention (PCI) of the left circumflex artery and outpatient programming for the AVF occlusion. Everolimus-eluting stenting was performed successfully using a 2.75 × 33 mm Xience Prime® stent (Abbott Vascular, Santa Clara, United States).

Fifteen days after the discharge, the patient had a new episode of prolonged angina at rest, with similar characteristics to those of the previous event, which resulted in a new admission to the coronary care unit. A new coronary angiography showed a patent stent and percutaneous occlusion of the AVF was then performed. Anticoagulation with unfractionated heparin at a dose of 100 U/kg and selective catheterization of the graft with a 7 F Amplatz Right-2 guide catheter were carried out. Due to the proximal tortuosity, it was decided to place two 0.014" ChoICE® PT Extra

Support Guide Wires (Boston Scientific Corporation, Natick, USA) distally, providing deep intubation of the guide catheter (Figure 2A).

Under fluoroscopic control, the 8.0 × 7.0 mm Amplatzer® Vascular Plug II was advanced (St. Jude Medical, Minnetonka, USA) up to the middle segment of the graft, when the guidewires were retracted and then, the device was released. Control angiography showed total occlusion of the graft 5 minutes after the release of the prosthesis (Figure 2B).

Case 2

Female patient, 45 years-old, with a history of hypertension, dyslipidemia and chronic coronary disease. She was submitted to PCI with drug-eluting stent implantation in left main coronary artery and left anterior descending and left circumflex arteries, in addition to two CABG procedures (the last in October 2012), with a current picture of atypical chest pain and dyspnea on exertion.

During the diagnostic investigation she was submitted to coronary angiography, which showed a Y graft from the radial artery to left anterior descending artery and saphenous vein grafts with distal anastomosis in the cardiac vein (Figure 3A).

Coronary angiography showed stents positioned in the left main coronary artery and in the proximal portions of the anterior descending and circumflex arteries, with severe focal in-stent restenosis at the left circumflex artery ostium, confirming the presence of AVF described on angiography (Figure 3B). Percutaneous occlusion of the AVF was performed during the

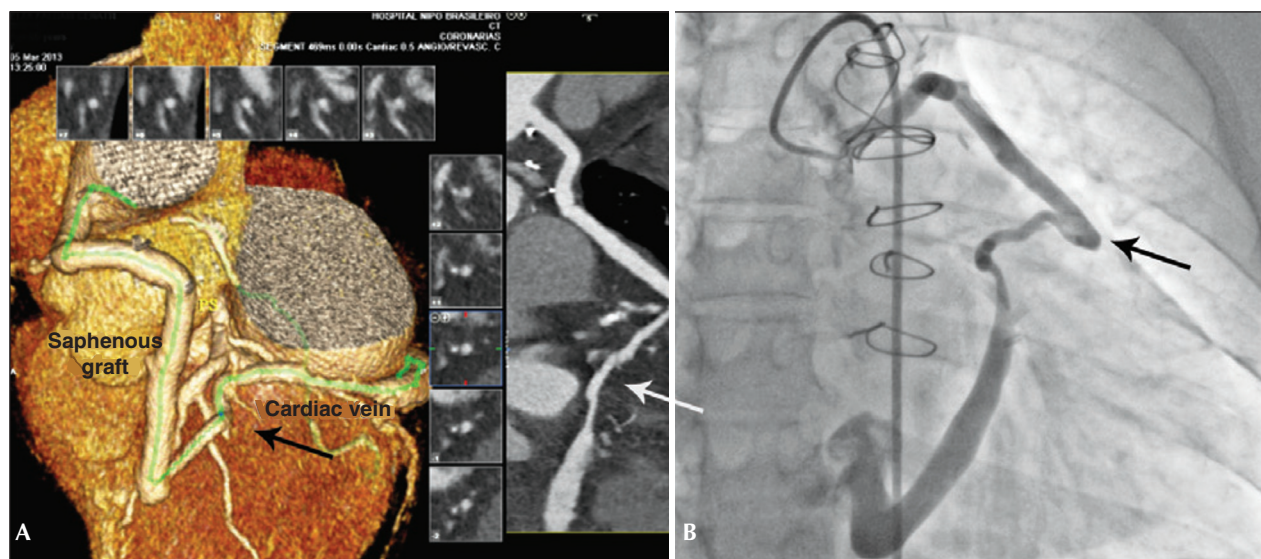


Figure 1 – Case 1: CT angiography demonstrating patent and dilated saphenous vein graft, connected to the great cardiac vein (arrow) in the left anterior oblique view (A) and angiography of the same graft in the right anterior oblique view (B).

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