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# Symptomatic Aneurysm of a Saphenous Vein Graft with Compression of the Right Atrium

*Dr. Roth*

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## ABSTRACT

A symptomatic aneurysm of a saphenous vein bypass to the right coronary artery in a 77-year-old female patient is presented. Surgical therapy included resection of the aneurysmal saphenous vein graft, reconstruction of the right atrium, and coronary artery bypass grafting (CABG) to the right coronary artery.

## INTRODUCTION

Large true aneurysms of saphenous vein grafts are rare complications after CABG. In most cases, pathologic examination shows a pseudoaneurysm developing at the anastomotic site or at the site of stent implantation [Katsumata 1995]. However, true aneurysms are due to arteriosclerotic lesions, infection of the vein wall or infectious mediastinitis [Smith 1992]. They may become symptomatic as a result of perforation into the right atrium or vena cava [Forster 1991, Richardson 1992, Nathaniel 1996], compression of the right atrium or vena cava [Ferreira 1997], early or late graft rupture [Werthmann 1991], mediastinal or presternal pulsatile tumor [Robicsek 1993], compression of other bypass grafts with subsequent myocardial infarction [Sahouri 1995] and, as in our case, thrombotic occlusion. Asymptomatic aneurysms of saphenous bypass grafts may appear as a mediastinal mass on chest x-ray. Diagnosis is based on transesophageal echocardiography, magnetic resonance imaging or selective coronary bypass angiography.

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## CASE REPORT

A 77-year-old female patient had coronary bypass grafting in 1987. Eleven years later she complained of angina, exertional dyspnoea and left-sided thoracic pain. Angiographic evaluation showed open bypass grafts to the anterior descending coronary artery and the marginal branch, but an occluded bypass graft to the right coronary artery (RCA) without any clues of aneurysm formation. RCA-graft occlusion was treated with PTCA and stent implantation. Control angiography opacified a dilated saphenous vein graft to RCA (see Figure 1 ◎). Simultaneous evaluation of the right atrium showed compression near the tricuspid valve (see Figure 2 ◎). MRI-scan demonstrated a 4 x 5 cm thrombotic pericardial mass compressing the right atrium with a small perfused lumen. The patient was operated on and a large aneurysm of the distal saphenous vein graft was found (see Figure 3 ◎). She was put on extracorporeal circulation (ECC) and the huge aneurysm was resected. Since the aneurysm was severely adherent to the atrial wall, a part of this had to be resected. The defect of the right atrium was closed with a Dacron® patch. The distal anastomosis was disconnected and a new saphenous bypass graft was anastomosed to the distal right coronary artery. The entire procedure was performed on a beating heart supported by ECC since aortic clamping was not necessary. Pathologic examination of the aneurysm showed old and fresh thrombotic material with a small central lumen (see Figure 4 ◎). Histology revealed a 6.5 x 4 cm aneurysm of the saphenous vein graft filled with thrombotic material of different ages. The patient did well eight months after the operation.

## DISCUSSION

There are a few case reports in the literature concerning true venous graft aneurysms. Main complications of such

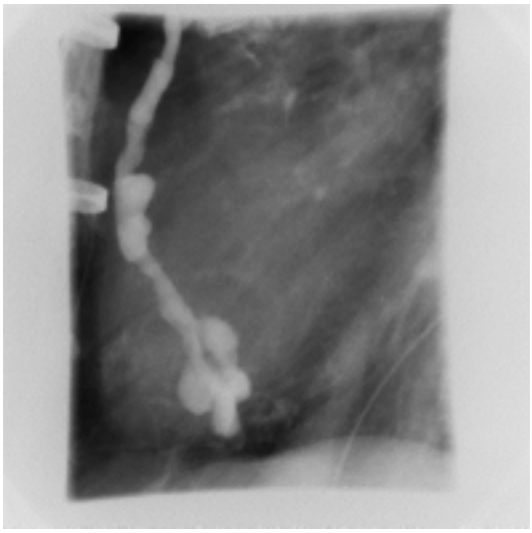

Figure 1. Angiography of the saphenous vein graft to the right coronary artery with peripheral aneurysm

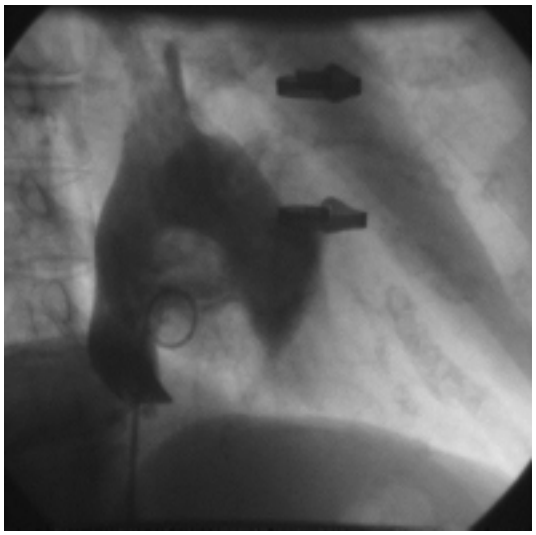

Figure 2. Angiography of the right atrium showing the external compression of the inferior right atrium

Figure 3. Specimen of the entire resected bypass aneurysm

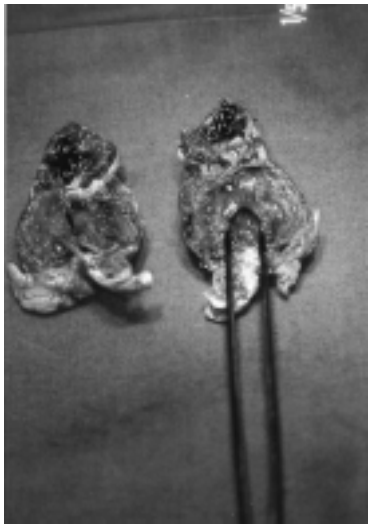

Figure 4. Cross-section of the bypass aneurysm showing fresh thrombotic material near the distal anastomosis

aneurysms are compression of the right atrium with possible fistula into the chamber. These aneurysms may mimic tumors of the anterior mediastinum. However, vein graft aneurysms rarely produce angina. Sahouri [Sahouri 1995] described a vein graft aneurysm which stretched the left internal mammary artery grafted to the left anterior descending artery. This resulted in impaired flow and eventually myocardial infarction.

In our case, the main symptom was angina that occurred after acute occlusion of the thrombosed aneurysm. Definitive surgical therapy included resection of the aneurysm along with adherent atrial wall, Dacron® patch closure of the residual atrial defect, and a new coronary bypass graft.

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## REVIEW AND COMMENTARY

***1. Editorial Board Member KK138 writes:***

The role of the stenting procedure to treat the occluded SV graft to the RCA should be clarified, especially as the authors mention in the introduction that stenting may cause pseudoaneurysms of vein grafts. Were there any clues on the first diagnostic angiogram (before stenting) that would have indicated an aneurysm of the graft? Was any echo study performed that demonstrated a mass adherent to the right atrium?

***Authors' Response by Matthias Roth, MD***

During the first diagnostic angiography, we saw an occluded bypass graft to the RCA without any clues of aneurysm formation. After PTCA and stent implantation, a second angiogram opacified a dilated saphenous vein graft to RCA. Preoperative MRI showed the bypass aneurysm clearly as a thrombotic paracardial mass compressing the right atrium with a small internal lumen. The MRI-cine sequence and a video of the intraoperative transesophageal echocardiography is now incorporated in the article.

***2. Editorial Board Member NC124 writes:***

I believe it is an interesting case. Even though reoperative coronary bypass surgery is very frequent today, we do not see a lot of true venous aneurysms from previous grafts. However, I would consider it important to stress that most lessions of this kind could be originated from injury to the vein during harvesting. This comes to the repeated issue of the importance of tissue treatment during grafts' procurement, which in most training hospitals is left to the less trained professional of the surgical team.

***Authors' Response by Matthias Roth, MD:***

This reviewer thinks that most of these lesions are due to injury to the vein during harvesting. This may be possible but it is hard to prove.