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Successful aneurysm resection and coronary artery revascularization following saphenous vein graft aneurysm rupture

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Abstract

Saphenous vein graft aneurysms after coronary artery bypass grafting (CABG) have been rarely reported. Their incidence and natural history are poorly defined. Herein, we present a patient who presented acutely with contained rupture of a large saphenous vein graft aneurysm 12 years after CABG, which was successfully managed with open aneurysm resection and regrafting.

Keywords: Coronary artery bypass grafting • Saphenous vein graft • Aneurysm • Rupture

INTRODUCTION

Aneurysmal dilation of saphenous vein grafts (SVGs) following coronary artery bypass grafting (CABG) has been rarely reported [1]. As a result, the incidence and natural history of SVG aneurysms are unknown. These lesions are often asymptomatic but can present mass-effect symptoms causing heart failure, myocardial ischaemia and rupture [2, 3]. Although only associated with approximately 8% of cases, SVG aneurysm rupture represents a catastrophic complication with a high risk of mortality [1]. Given the infrequent occurrence of this complication and its relatively heterogeneous clinical manifestations, there is no consensus available regarding management strategies. Herein, we present a case of SVG aneurysm rupture 12 years after CABG that was successfully managed by an operative repair.

CASE PRESENTATION

A 57-year-old man was referred to the emergency department following an episode of syncope associated with progressively worsening back pain over the preceding week. The patient also endorsed a several-hour history of worsening chest pain, similar to the pain related to his prior myocardial infarction. He had undergone CABG 12 years ago with a sequenced left internal mammary artery graft to the main and second diagonal branches of the left anterior descending artery and an SVG from the ascending aorta to the posterior descending artery. His medical history was also notable for Child–Pugh Class B cirrhosis secondary to chronic hepatitis C, which was under active treatment with ledipasvir/sofosbuvir. Upon presentation, the patient's vitals were notable for

hypotension with an initial blood pressure of 81/52 that normalized with fluid resuscitation. Computed tomography (CT) angiogram demonstrated a 5.5-cm aneurysm of the mid-segment SVG with active contrast extravasation and associated haemopericardium, consistent with aneurysm rupture (Fig. 1A and B). The patient was taken emergently to the OR with cardiopulmonary bypass (CPB) initiated via right axillary artery and femoral vein cannulation prior to redo sternotomy. While on CPB, the aneurysm was controlled proximally and distally and then resected between ligated proximal and distal ends of the affected SVG. An additional segment of the SVG was subsequently harvested endoscopically and utilized as a new aorta-to-PDA bypass graft. Postoperative echocardiogram demonstrated normal right ventricular (RV) and left ventricular wall motion with improvement in RA and RV compression. Histopathological analysis of the aneurysmal vein graft was notable for mild calcification, intimal atherosclerosis and luminal clot. Aside from a relatively long convalescence, the patient's recovery was otherwise uneventful, and he was discharged home on postoperative day 16. At his 4-month postoperative follow-up visit, the patient reported that he returned to normal function and is without angina or dyspnoea.

COMMENT

Herein, we describe an unusual case of an SVG aneurysm rupture that was successfully managed with prompt surgical intervention. As in the case presented here, among the scant reports on the topic, SVG aneurysms are usually discovered over a decade after the index surgery. Unlike this case, however, reported SVG aneurysm cases very infrequently involve grafts to the PDA (3.5%) or

Figure 1: Computed tomography scan demonstrating lobular collection of extraluminal contrast near the AV groove, arising from the mid-aspect of the RCA to the PDA bypass graft (**A** and **B**). The ruptured aneurysm sac (arrows) and haemopericardium (asterisks) are shown.

present with RV compression (7.2%) [1]. Furthermore, to our knowledge, there are very few reported cases of successful surgical management of SVG aneurysm rupture, with most cases resulting in patient death [3–5]. In our case, prompt recognition of this complication with early surgical intervention resulted in a good outcome.

Although vein graft aneurysms are an exceedingly rare complication of CABG, given the diverse clinical manifestations of this disease process, unpredictable timeline of aneurysm progression and potentially devastating consequences of rupture, it is a complication that certainly merits attention. The management of SVG aneurysms depends on patient presentation and degree of haemodynamic stability. Although asymptomatic aneurysms are sometimes monitored with serial imaging, large or symptomatic aneurysms necessitate prompt intervention. In this case, the large size of the aneurysm and rupture leading to tamponade and heart failure required immediate intervention. Endovascular repair was considered; however, it was ultimately decided that peripheral cannulation with CPB in the OR would be a safer approach, given the large quantity of blood in the mediastinum and tamponade physiology seen on echocardiogram. In addition, revascularization was necessary, given the wall motion abnormalities seen on echocardiogram and large territory supplied by the graft. We elected to utilize an additional SVG for revascularization, given its relative ease of harvest.

With increasing utilization rates of CT in recent years, the diagnosis of SVG aneurysms will continue to increase in frequency. As

such, early multidisciplinary evaluation and intervention must be emphasized. The optimal approach to the management of incidentally discovered asymptomatic aneurysms has yet to be determined. Additional investigation is warranted regarding the pathophysiology of the disease process, identifying predictors of aneurysm development and progression, as well as optimal strategies for repair.

Conflict of interest: none declared.

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