Mediastinal mass presented 36 years after coronary bypass grafting: is vein graft pseudoaneurysm a differential diagnosis?

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Abstract

Saphenous vein graft aneurysm is a relatively rare but serious complication of coronary artery bypass grafting (CABG). The diagnosis of such cases is clinically challenging and requires a high index of suspicion, especially if presented atypically or very late after CABG. Herein, we report a case of a saphenous vein graft pseudoaneurysm that presented 36 years after CABG and masquerading as a right atrial myxoma.

Keywords: CABG • Mediastinal mass • Vein graft • Pseudoaneurysm

INTRODUCTION

Classic differential diagnoses of mediastinal mass include lymphoma, teratoma, thymoma, cardiac tumour but not saphenous vein graft (SVG) pseudoaneurysm (SVGPsA), which is a relatively uncommon, but serious complication after CABG. The diagnosis is clinically difficult and requires a high index of suspicion. Herein, we report a case of SVGPsA presenting 36 years after CABG and masquerading as an atrial myxoma.

CASE SUMMARY

A 75-year old male with a history of triple-vessel CABG in 1978 presented with shortness of breath and a mediastinal mass that was followed up conservatively for the preceding 2 years as a right atrial myxoma. Surgical resection of the mass was deferred owing to being high-risk patient with multiple comorbidities. On admission, transthoracic echocardiogram (TTE) showed a 9.4 cm × 6.5 cm fixed extracardiac mass compressing the right ventricle with resultant functional tricuspid stenosis (mean gradient 10 mmHg) (Fig. 1). Chest X-ray showed an enlarged cardiac silhouette with radiographic findings consistent with congestive heart failure (Fig. 1). For better characterization of the mass, a non-contrast magnetic resonance imaging (MRI) study was pursued, which showed a 10.9 × 7.4 × 6.5 cm vascular mass in the atrioventricular groove with flow into the mass (Fig. 2, Video 1). The diagnosis was suggested to be in favour of a thrombosed SVGPsA rather than an atrial myxoma.

COMMENT

We are reporting a case of SVGPsA that presented 36 years after CABG, which is, to our knowledge, the longest interval period that has been reported. In this current report, we aim to highlight some characteristic aspects of SVG aneurysm (SVGa). Firstly, it is a rare, but potentially fatal complication, with incidence <1% and only around 100 cases reported over four decades [1–3]. Secondly, it requires a high index of suspicion as a majority of cases are asymptomatic, and incidentally found on a chest radiograph showing a mediastinal/hilar mass. Nonetheless, SVGPsA is less
Figure 1: Left panel, upper: chest radiographic findings consistent with congestive heart failure, no mass was appreciated. Left panel, lower: Transthoracic echocardiogram (TTE) showing a mass (arrow) compressing RA and right ventricle. Right panel: coronary angiogram showing a patent aneurysmal SVG-to-RCA graft that does not fill the RCA; however, contrast washes out of the graft into the PsA.

Figure 2: Magnetic resonance imaging (MRI). (A) axial $T_2$-weighted MRI showing the course of the SVG originating from the aorta and communicating with the mass (arrows). (B) Cine-MRI, in the oblique sagittal section, showing a large, circular mass (arrows) compressing the right ventricle with flow void into the mass. (C) Giant thrombus (12.5 × 8.1 × 5.8 cm) within the SVG-PsA originating from the distal anastomosis to the RCA. After complete excision of the PsA, both ends of the graft (dashed circles) were oversewn with pledgeted polypropylene 4-0 sutures. Revascularization was done with a new SVG to the posterior descending artery.
likely to be included in the initial differential diagnosis, especially if presented remotely after CABG without cardiac-related symptoms. It would be even more challenging to suspect if no mass had been detected on chest radiograph, as in our case (Fig. 1). Thirdly, there is no established systematic approach for diagnosis or management considering its rarity.

The exact underlying pathogenesis of SVGPsA formation is unclear, but it tends to occur at the anastomotic site and secondary to technical error, infection, partial tear or pericardial adhesions [2]. On the other hand, true aneurysm (SVGA) typically involves the body of the graft at weak points as the branching site, valves or traumatized areas during harvesting. Other contributing factors include hyperlipidaemia, atherosclerosis and vasculitis [2]. Based on the literature, true aneurysms of an SVG are more common than SVGPsA [1, 3, 4]. In our case, we speculated that a slow leak from the distal anastomosis of SVG-to-RCA was contained by pericardial adhesions, resulting in SVGPsA formation.

The presentation of SVGA varies widely; from an asymptomatic mass to serious complications such as myocardial infarction, rupture, mass effect, heart failure or fistula [3, 4]. The classical triad of chest pain, mediastinal mass and history of CABG was suggested to suspect an SVGA [2]. The average time of presentation is several years after CABG. However, SVGPsA can present as early as a few days and SVGA can present as late as 28 years [2–4]. We propose a pyramidal approach to suspect SVGA. Prior CABG is at the top of the pyramid; then the presentation includes a mass or cardiac-related symptoms, while accidental imaging findings such as a hilar mass on chest X-ray are at the base. To avoid fatal complications, if misdiagnosed, we recommend that SVGA should be included in the differential diagnosis of a mediastinal mass in patients with prior CABG.

Computed tomography (CT) can diagnose a patent SVGPsA, while it will be difficult to diagnose an occluded SVGPsA. In three different case reports, SVGA with occluded lumen were misdiagnosed by CT as solid tumours and was erroneously approached through lateral thoracotomy [5]. Cardiac MRI has been reported to be a remarkably useful tool for SVGA diagnosis and seems to be the modality of choice [4]. In our case, cardiac MRI diagnosed SVGPsA and saved the patient from undergoing unnecessary comprehensive biopsy procedure. Cardiac catheterization is a key investigation for confirming the diagnosis and for preoperative planning. However, it is limited by demonstrating only the lumen and, hence, with the inability of showing the actual size of the aneurysm if occluded. In our case, the coronary angiogram showed only contrast in the localized aneurysmal dilatation of SVG-to-RCA (Fig. 1). The same area was represented on Cine-MRI images as having localized flow within the mass (Fig. 2, Video 1).

Treatment strategies for SVGA are medical therapy, endovascular therapy and surgery. Because the natural history of the disease is unknown and given the high risk for complications, a conservative approach should be limited to an asymptomatic case with stable mild dilatation of the SVG and distal vigorous run-off. An alternative approach to surgery in high-risk patients is endovascular therapy such as the use of percutaneous coil embolization or covered stent [4]. However, exclusion of SVGA without concomitant revascularization poses a theoretical risk of myocardial ischaemia. Additionally, persistent mass effect renders the endovascular approach impractical for giant aneurysms. We recommend surgical resection with revascularization, if indicated, in symptomatic large aneurysms causing mass effect with interruption of the distal run-off.

Conflict of interest: none declared.

REFERENCES