

From Myocardial Infarction to Peripheral Stenting

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Abstract

Degenerated saphenous vein grafts (SVGs) are associated with high risk of myocardial infarction (MI). They are difficult to treat percutaneously because of large variability in their wall diameters. We report a case of a 71-year-old male, who presented with an acute inferior ST elevation MI (STEMI) 16 years following revascularization with triple coronary artery bypass graft (sequential SVG to the posterior interventricular and to the second marginal branch of the left circumflex artery, and left internal mammal artery to the left anterior descending). Coronary angiography revealed a massive thrombotic occlusion of the second part of the sequential graft, which was aneurysmal just after the posterior interventricular artery. Thromboaspiration was performed and revealed an 8 mm diameter aneurysmal degenerated graft. We decided to use a balloon-expandable peripheral stent to treat this lesion. TIMI 3 outflow was restored without any no-reflow phenomenon. Patient was discharged to his origin hospital 3 days later. He had an uneventful evolution at the 3 months follow-up.

Keywords: Myocardial infarction; Degenerated saphenous vein graft; Balloon-expandable stent

Introduction

Saphenous vein graft (SVG) bypass remains widely used for coronary artery bypass revascularization in North America. The mean patency duration of SVGs is approximately 8 - 9.9 years [1]. Percutaneous interventions on degenerated SVGs are associated with up to 30% of short- and long-term major adverse cardiovascular events (MACEs) [2]. Such procedures have evolved to reduce embolization and restenosis. Primary percutaneous interventions on aneurysmal degenerated SVGs are difficult because of variable diameters along the SVGs. We report a case of acute myocardial infarction (MI) in which angiography showed an acute thrombosis of a voluminous degenerated SVG. Thrombectomy was realized and angioplasty was performed using a balloon-expandable peripheral stent.

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Case Report

A 71-year-old male was referred to our catheterization center for inferior ST elevation MI (STEMI). The patient underwent triple coronary artery bypass graft (CABG) 16 years previously, with sequential SVG to the posterior interventricular and to the second marginal branch of the left circumflex artery (LCA), and left internal mammal artery (LIMA) to the left anterior descending (LAD). His risk factors were hypertension, diabetes mellitus and dyslipidemia. The patient was regularly followed up and was taking diligently his medication (aspirin, rosuvastatin and metformin).

Intermittent chest pain started 2 days prior to admission. He was initially planned for a non-invasive ischemic test, as there were no electric modifications or cardiac hypersensitive troponin elevations at the emergency room. A more intense and sustained chest pain occurred few hours before his second admission. He was referred to the emergency room and his baseline EKG showed an inferior STEMI. He received intravenous heparin, aspirin and a loading dose of ticagrelor at the admission. He was emergently transferred to the hemodynamics department to perform coronary and bypass angiography. Native coronary angiogram showed a severe stenosis of the distal left main, an occlusion of the proximal LAD, the proximal LCA and the proximal right coronary artery (RCA). The LIMA to the LAD graft was patent. Finally, SVG angiogram showed a massive thrombotic occlusion of the second part of the sequential graft, which was aneurysmal just after the posterior interventricular artery (Fig. 1).

A continuous infusion of IIb/IIIa inhibitors was started after identifying the culprit lesion. An 8-Fr MP-A1 guiding catheter (Cordis Corp., Miami Lakes, USA) was used to engage the SVG. A BMW universal wire (Abbott Vascular, Santa Clara, USA) easily crossed the occlusion and partially successful thromboaspiration was performed. After pre-dilation with a 2.0 mm diameter balloon, TIMI 2 flow was restored and the angiogram revealed an 8 mm diameter (quantitative coronary angiography measurement) aneurysmal degenerated graft (Fig. 2). We decided to use a balloon-expandable peripheral stent to treat this lesion. A 260 cm Glide hydrosteer wire (St Jude Medical, St Paul, USA) was carefully taken down in the RCA in order to have enough length and backup to bring the stent (Fig. 3). An 8.0 × 24 mm Genesis bare metal stent (Cordis Corp, Miami Lakes, USA) was easily taken down and deployed in the SVG (Fig. 4). TIMI 3 outflow was restored without any no-reflow phenomenon. Patient was discharged to his origin hospital 3 days later. He had an uneventful evolution at the 3 months follow-up.

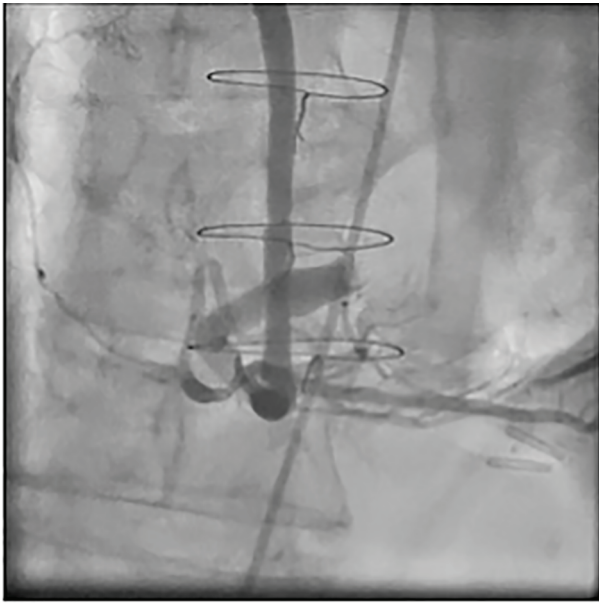


Figure 1. Thrombotic occlusion of the second part of the sequential saphenous vein graft after the posterolateral anastomosis.

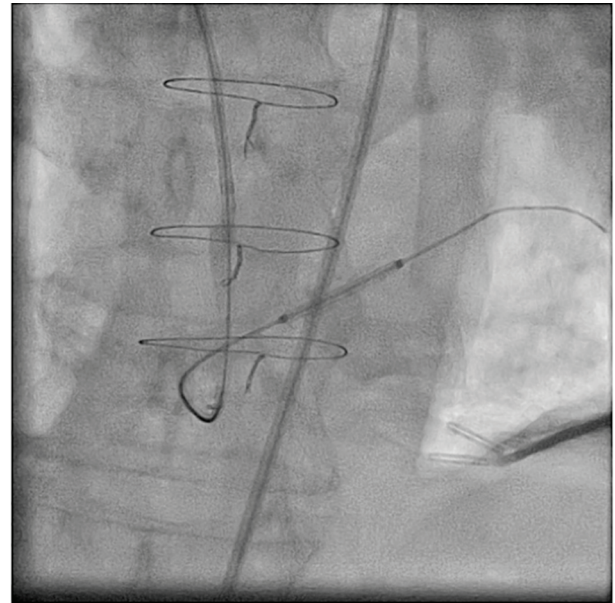


Figure 3. Use of a 260 cm hydrosteer glide wire to have enough length and backup.

Discussion

Acute MIs involving SVGs are difficult to treat and associated with long-term higher event rates, such as mortality rate of 26%, recurrent MI rate of 26% and recurrent revascularization rate of 40% [3, 4]. Procedural complications and no-reflow rates remain high even if distal embolization protection devices have decreased significantly these risks from 20% to

less than 10% [5]. Mostly because of the large vessel size in degenerated SVG, choice of stent and distal embolization protection strategy is a primary concern. No distal embolization protection device has been used in this case considering the large size of the culprit vessel.

The optimal management of SVG aneurysm remains controversial, especially during acute MI. Traditionally, medical treatment, repeat CABG and covered stents have been advised in large aneurysm [2].

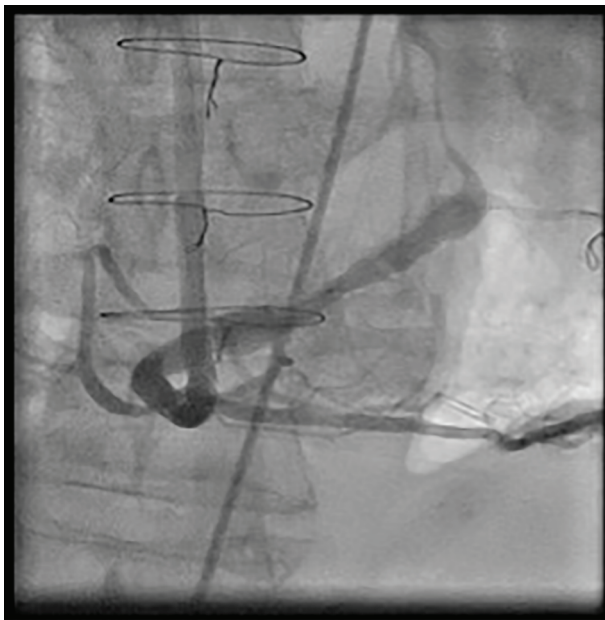


Figure 2. TIMI 2 flow after thrombectomy and predilatation showing an 8 mm reference diameter on QCA.



Figure 4. Final result after inflation of a peripheral Genesys 8 x 24 mm stent, Cordis.

To our knowledge, we described the first case of degenerated SVG treated with a balloon-expandable peripheral stent during STEMI. SVG stenting with large peripheral stents seems to be feasible and safe. In addition, peripheral self-expandable stents have already been used safely in elective procedures [6]. Moreover, another type of self-expandable stent, the SESAME stent, has been tested successfully with 14% MACEs at 9-month follow-up [7]. From a theoretical point, the treatment of degenerated SVGs with balloon-expandable or self-expandable peripheral stents seems safe and feasible in acute MI presentation.

Conclusion

Degenerated SVGs can be safely treated with balloon-expandable peripheral stent in order to match the large vessel size and avoid strut malposition in acute MIs.

Conflict of Interests

The authors report no conflict of interest.

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