

Attempted retrograde reopening of an occluded left main stent

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Percutaneous revascularization is generally considered to be the treatment of choice for patients with recurrence of symptoms following coronary artery bypass surgery. Protected left main disease is usually approached in an antegrade way. However, if the left main coronary artery is occluded, such an approach is often very challenging, and alternative strategies are adopted. We present a case of attempted retrograde reopening of an occluded left main stent through the right coronary artery, a sequential radial graft from the right coronary artery to the marginal branch and eventually in a retrograde way to the left main coronary artery. Although this case was unsuccessful it demonstrates how technological developments are allowing interventionists to tackle a vast range of challenging cases, which only few years ago would have been considered impossible.

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Introduction

Percutaneous revascularization is generally considered to be the treatment of choice for patients with recurrence of symptoms following coronary artery bypass surgery (CABG)¹. However, this patient group continues to present many challenges to interventional cardiologists and occasionally necessitates novel approaches to treatment. Percutaneous revascularization of a left main coronary artery "protected" by patent grafts is usually attempted using an antegrade approach². However, when a calcified left main coronary artery is chronically almost totally or totally occluded the antegrade approach may be unsuccessful. This is particularly true in case of ostial occlusion which limits guide catheter support. We present a case of attempted retrograde reopening of an occluded left main stent.

Case report

A 63-year-old man presented with recurrent angina following CABG which had included grafting of the left internal mammary artery (LIMA) on the left anterior descending artery (LAD) and radial artery anastomosis from the LIMA to the first obtuse marginal (side to side) and posterior descending branches of the right coronary

artery (RCA). Symptoms of unstable angina had first recurred 8 weeks after surgery when repeat angiography revealed proximal occlusion of the radial graft at the site of anastomosis with the LIMA. The distal segment of the radial graft was patent with retrograde flow from the RCA to the distal circumflex artery (Cx). The LIMA graft was patent although flow was poor. Stenting of the left main and the proximal Cx arteries and the diagonal branch was performed with good angiographic results and an improvement in symptoms. Unfortunately, pain recurred 6 months later and repeat angiography demonstrated occlusion of the left main stent, improved flow in the LIMA, and persistent retrograde flow from the RCA to the Cx via the patent distal radial graft. Antegrade angioplasty of the left main coronary occlusion was attempted, but the guidewire could not be passed. We then attempted retrograde percutaneous revascularization to the left main coronary artery. A wire (PT Graphix, Boston Scientific, Minneapolis, MN, USA) was passed through the RCA, the distal radial graft, the distal marginal branch of the Cx and up to the left main coronary occlusion. We were then able to pass a short balloon (2 × 9 mm Maverick, Boston Scientific) through the Cx stent occlusion. Balloon inflation was performed within the Cx stent occlusion, but despite being only 2-3 mm from the left main coronary ostium, we were unable to

re-enter the left main coronary artery retrogradely (Fig. 1). After repeated attempts the patient developed bradycardia and the procedure was abandoned. There was no procedural troponin rise. In our opinion, the patient was not a good candidate for repeat CABG and currently remains symptomatic despite medical treatment.

Discussion

We attempted retrograde reopening of an occluded left main stent. Although this case was unsuccessful, it demonstrates how technological developments are allowing interventionists to tackle a vast range of challenging cases, which only few years ago would have been considered impossible. In this case the presence of a patent distal segment of graft linking the RCA and the Cx justified our attempt at retrograde reopening of the left main coronary artery. Two similar reports have been described in the literature. Kahn and Hartzler³ de-

scribed a series of 17 arterial segments treated retrogradely through a saphenous vein graft with a 70% success rate. This strategy has since then been employed intermittently in clinical practice. Silvestri et al.⁴ reported a case of retrograde stenting of a left main subtotal occlusion through a saphenous vein graft on the mid LAD. Despite the difficulty of the retrograde approach this technique proved successful.

Our attempt may have failed for a variety of reasons. The distance between the ostium of the RCA and the occlusion in the Cx stent was long, involving the entire RCA, the radial graft and the marginal branch thus limiting the possibility of guidewire manipulation. More importantly, in this case we faced two sequential occlusions inside two stents. Chronic coronary occlusions continue to represent a challenging subset of lesions for the interventional cardiologist, with a high failure rate. Optimal guide support and accurate placement of a supportive guidewire are fundamental for procedural success⁵. In this case our choice of wire was

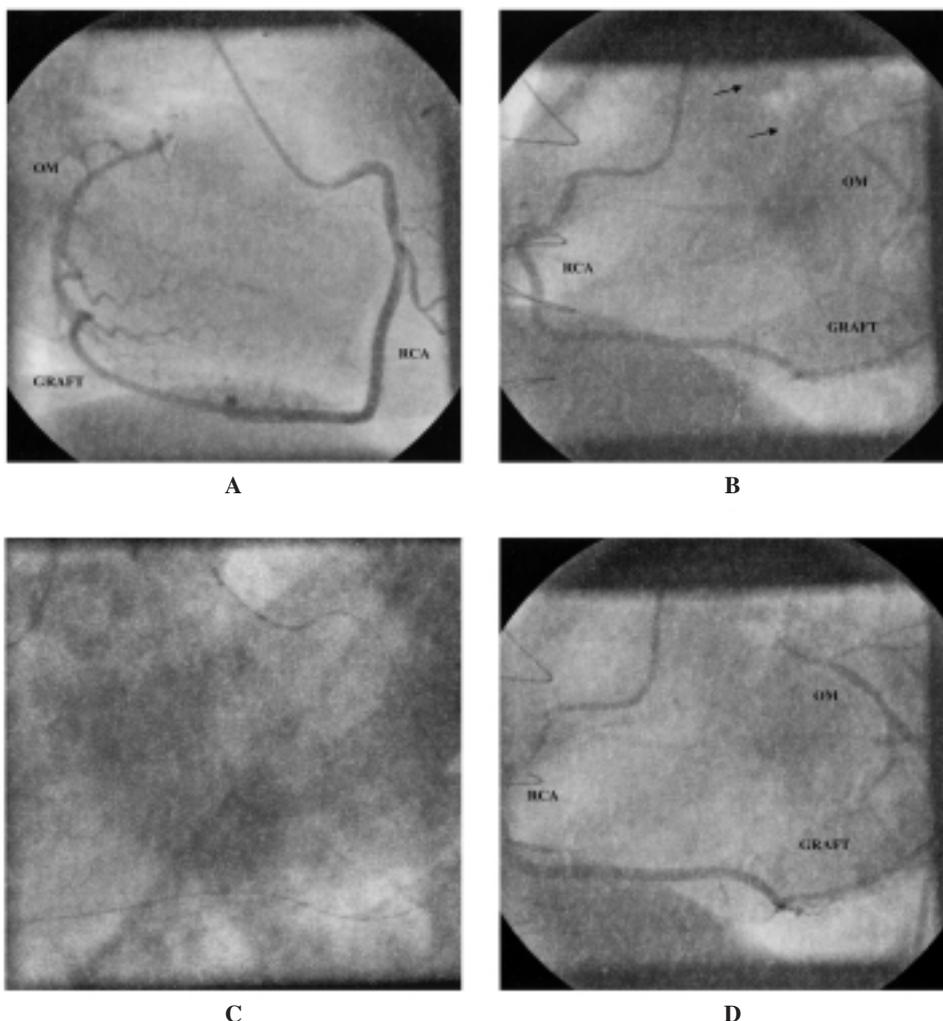


Figure 1. A: 90° right lateral view showing the distal radial graft and the retrograde flow from the right coronary artery (RCA) to the first obtuse marginal branch (OM). B: 50° left anterior oblique view of the same vessels; arrows indicate the circumflex and left main coronary stents. C: 50° left anterior oblique view showing the wire supported by a short balloon which has been passed through the circumflex coronary stent. D: 50° left anterior oblique view showing some blood flow through the circumflex coronary stent after the attempts at reopening.

restricted since a stiffer wire such as a Standard (Guidant) or Cross-it (Guidant) wire would result in ischemia and, in particular, in unacceptable distortion of the RCA. The PT Graphix wire (Boston Scientific) is a hydrophilic wire which often permits crossing of almost total or total occlusions with minimal support. With this strategy we reopened and ballooned the initial stent in the Cx but we failed to reopen the left main stent. This may be related to the pathophysiology of in-stent restenosis as the neointima is dense material which is resistant to balloon compression. Passage of wires through an occluded stent is usually successful but can be unpredictable and particular care is necessary when entering the stent orifice. In the present case, the procedure had to be abandoned at this stage as we could not enter the lumen of the left main stent.

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