Saphenous vein graft marker and coronary artery bypass graft stenosis in a patient 19 years after coronary artery bypass surgery

Murat Ugurlucan¹, Turkan Tansel¹, Sabahattin Umman¹, Faruk Erzengin², Mehmet R. Calay³, Ertan Onursal¹

Abstract

The saphenous vein is one of the most commonly used conduits during coronary artery bypass grafting. Saphenous vein graft markers have been introduced to facilitate coronary angiography procedures in the follow-up of patients with ischaemic heart disease. However, today these markers have only a historical aspect. This report presents a 61-year-old patient who had undergone coronary artery bypass grafting 19 years ago. A saphenous vein graft marker had been used during the operation, and there was stenosis formation at the patent vein graft coincidentally where it overlapped the marker.

Key words: coronary atherosclerosis, coronary artery bypass grafting, saphenous vein, grafts, marker.

Introduction

Coronary artery disease is the leading cause of death throughout the world. Coronary artery bypass grafting (CABG) has been shown to be the most effective way of relieving symptoms of patients with ischaemic heart disease [1, 2]. Use of the saphenous vein as a graft during CABG was first accomplished by Favaloro in 1967 [3] and since then, it has been one of the most commonly used conduits during bypass surgery.

In the early 1970s, saphenous vein graft (SVG) markers were introduced to facilitate post-CABG coronary angiographies [4]. Eisenhauer et al. [5] showed that marked grafts were easily identified during subsequent angiographies. The marked grafts also used lower contrast media and reduced the time for radiation exposure. However, these markers have lost their popularity during CABG.

Saphenous vein graft markers were routinely used during CABG procedures in our institution between 1987 and 1989 by one of the senior surgeons. In this report, we present a patent bifurcated SVG 19 years after CABG. There was stenosis formation at the proximal segment of the graft and it was coincidentally where it overlapped the marker.
Case report

The patient was a 61-year-old male who presented with angina pectoris 19 years after CABG. His exercise capacity was NYHA Class II. At the age of 42 years, he had presented with compressive chest pain radiating to the back and left arm at rest. He had been diagnosed with unstable angina pectoris, and the angiography conducted at the time revealed a critical occlusive lesion in the left anterior descending coronary artery (LAD). Thus, he had undergone emergent CABG in our institution. The intervention included distal anastomoses on the LAD and first diagonal coronary artery with a bifurcated SVG, and the proximal end of the SVG had been anastomosed to the ascending aorta. An SVG marker (A/C LOCATOR graft marker, SCANLAN Graft Markers, USA) had been implanted into the ascending aorta around the proximal SVG anastomosis. He had been asymptomatic for one year until when he started to feel dyspnoea and chest pain on exertion that had progressed in the past three months. Exercise electrocardiography was positive for myocardial ischaemia in the anterolateral regions of the heart. 64-slice CT angiography of the coronary artery revealed 80% stenosis in the proximal segment of the SVG where it overlapped the SVG marker (Figure 1A, 1B, 2A). Balloon angioplasty and stent implantation were considered for the treatment and on an elective
basis, the stenotic region of the SVG was dilated successfully with a 3.5×16 mm JO coronary stent (Figure 2B).

**Discussion**

CABG operation is the most efficient method of treatment for patients with ischaemic heart disease in the current era [1, 2]. Although both arterial and venous grafts can be utilized during CABG, autologous SVG is one of the most commonly used conduits since its first proposal at Cleveland Clinic in 1967 by Favaloro [3]. Vein grafts possess a remarkably higher stenosis rate when compared to the arterial conduits. Atherosclerosis and degenerative changes occur at least in 50% of the venous grafts in five years following CABG [6]. Thus, regular follow-up of patients after CABG by conventional coronary angiography or by recent radiological methods such as multislice CT angiography is mandatory. Today, conventional angiography is the gold standard method to evaluate the coronary arteries and the status of the bypass conduits with its major advantage of immediate direct intervention to the diseased vessels. However, conventional coronary angiography may become imperative especially in occluded grafts.

Graft markers implanted into the ascending aorta around the bypass grafts were introduced in the 1970s. They precisely point to the proximal anastomosis region of the bypass conduits. In various studies, the advantages of these markers have been clearly presented [4, 5, 7-9]. They lower the morbidity of cardiac catheterization in patients with a history of CABG. They indicate the number and location of the aorto-vein anastomoses, facilitate emergent coronary angiography, shorten the catheterization duration and exposure to radiation, decrease the amount of contrast usage and thus contrast-related complications, and reduce unnecessary probing and thromboembolic complications [4, 5]. Eisenhauer et al. [7], in their retrospective review, investigated the effect of graft markers on subsequent graft patency, and they showed that there was no increased risk of graft occlusion in patients who received graft markers during CAGB when compared to the ones without a marker. However, these markers lacked broad use in time, and today they only have a historical place in the cardiac surgery field.

The tendency of surgeons in the late 1980s in our institution, as well as the requests of the cardiologists performing the angiographies, was for the use of these markers. They were routinely used for a short period in our institution. Interestingly, the SVG of one of our patients is still patent even 19 years after the CABG. The SVG, SVG marker, previous coronary artery lesions, and the stenosis in the SVG were demonstrated by 64-slice CT angiography and the patient was treated with angioplasty and stenting.

In conclusions, although SVG markers have a historical use during CABG, at the time of their popularity they facilitated the follow-up of patients. This is one of the rare reports briefly reviewing the use of graft markers with a case presentation, in which a saphenous vein graft had been patent for 19 years and the patient presented with coincidental stenosis formation in the graft where it overlapped the marker and was treated successfully.

**Acknowledgments**

The authors would like to thank Ms. Safak Ugur and Ms. Toni Spring for their valuable contribution in linguistic revision of the manuscript.

**References**