



Case Report

Angiographically Patent Saphenous Vein Graft to Left Anterior Descending Artery at 51 Years Post-Coronary Artery Bypass Grafting

Rahul Kurup, MBBS, PhD, and Kumar Sridhar, MD

Division of Cardiology, Department of Medicine, Western University, London Health Sciences Centre, London, Ontario, Canada

ABSTRACT

We describe an unusual case of an angiographically patent saphenous vein graft to the left anterior descending artery at 51 years post coronary artery bypass grafting surgery in a patient who presents with exertional dyspnea and only relatively recent tobacco-smoking cessation. Factors associated with improved saphenous vein graft patency include the target vessel used for grafting, good distal run-off, and the use of optimal medical therapy alongside aggressive cardiovascular risk-factor modification.

RÉSUMÉ

Nous rapportons le cas inhabituel d'un greffon de veine saphène perméable à l'angiographie, greffé à l'artère interventriculaire antérieure 51 ans auparavant après un pontage aorto-coronarien, chez une patiente présentant une dyspnée à l'effort et ayant arrêté de fumer assez récemment. Parmi les facteurs associés à une meilleure perméabilité du greffon de veine saphène, citons le vaisseau cible utilisé pour la greffe, la bonne qualité du lit d'aval et l'utilisation d'un traitement médical optimal associé à une prise en charge énergique des facteurs de risque cardiovasculaire.

An 81-year-old woman, with an 18-month history of increasing exertional dyspnea and a positive myocardial perfusion scan, was referred for elective coronary angiography. She denied any chest pain, palpitations, and presyncope. She had undergone single coronary artery bypass grafting (CABG) of her left anterior descending (LAD) artery with a saphenous vein graft (SVG) 51 years prior, when she was only 30 years old, for anginal symptoms that she describes as exertional chest pain that radiated into her arm.

A recent dipyridamole with cycling sestamibi myocardial perfusion scan revealed moderate reversible ischemia within the myocardial apex, involving 5%-10% of the left ventricular mass. Left ventricular systolic function was normal, and no evidence was seen of infarct-related scarring. Electrocardiogram tracings demonstrated 1-1.5 horizontal ST depression in the inferolateral leads. Her cardiac risk factors included hypertension, hypercholesterolemia, and a 30-pack-year tobacco-smoking history, which she had stopped only 8 years prior. Her other past medical history was significant for hypothyroidism, gastroesophageal reflux disease, and a previous

hysterectomy. Her medications included aspirin, ramipril, rosuvastatin, rabeprazole, and levothyroxine, as well as salbutamol and tiotropium for presumed chronic airway disease; however, no formal pulmonary function testing had been undertaken. She had a healthy body mass index of 24.5 and described good glycemic, lipidic, and blood pressure control.

Coronary angiography was performed via the right radial approach using a 6-Fr Glidesheath Slender (Terumo Medical Corp., Tokyo, Japan) sheath. 5.2-Fr JL3.5 and JR4 Super Torque (Cordis Corp., Hialeah, FL) diagnostic catheters were used to engage the native left and right coronary ostia, respectively. Angiography revealed an occluded LAD in the mid-segment (Fig. 1).

The SVG to the LAD, which was imaged using a 5-Fr AL1 Infiniti diagnostic catheter (Cordis Corp.), was still patent (grade BIII on FitzGibbon classification)¹ with moderate degeneration in the mid-portion, with focal 50% and 70% lesions (Fig. 2). The LAD had a chronic total occlusion (CTO) just distal to the SVG anastomosis, with some filling of the LAD via collaterals from the right coronary artery and left circumflex to the apex. The left circumflex and right coronary artery itself (images not shown) had mild-to-moderate disease only. Overall, given the patient's anatomy and the correlation of the patient's myocardial perfusion scan findings with the CTO region of the LAD, we elected to pursue medical management in the first instance, as it was felt that CTO intervention through the degenerated graft would be challenging, given the age of the graft, and was not indicated.

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Ethics Statement: The research reported has adhered to the relevant ethical guidelines.

Corresponding author: Dr Rahul Kurup, Western University, London Health Sciences Centre, 339 Windermere Rd, London, Ontario N6A 5A5, Canada. Tel.: +1-519-685-8500.

E-mail: rahul.kurup@lhsc.on.ca

See page 662 for disclosure information.

Novel Teaching Points

- Factors associated with improved SVG patency include the target vessel used for grafting, good distal run-off, surgical harvesting techniques, aggressive risk-factor modification, and the use of optimal medical therapy.

Here, we describe an unusual clinical scenario of a patent SVG at 51 years post CABG, with the literature demonstrating only a 40%-50% patency rate of SVGs at 10 years, and approximately 11% of early SVG occlusion within 1 year post-CABG.^{2,3} Current guidelines recommend the use of

arterial conduits vs SVGs for coronary revascularisation, given superior clinical outcomes with the use of left internal mammary artery to graft the LAD artery and right internal mammary artery (RIMA) or radial arterial grafts to graft significantly stenosed, non-LAD vessels.^{4,5} To the best of our knowledge, the current literature contains no description of documented patency of an SVG this many years post-surgery. The longest duration of a described patent SVG is currently 35 years.⁶ Factors associated with improved SVG-LAD patency, from a small retrospective study where the mean SVG age was 30 years, include the target vessel used for grafting, with the LAD artery demonstrating the highest patency rates, good distal run-off, sequential bypass, and strict medical management, including smoking cessation and weight management.⁶ Other factors associated with improved

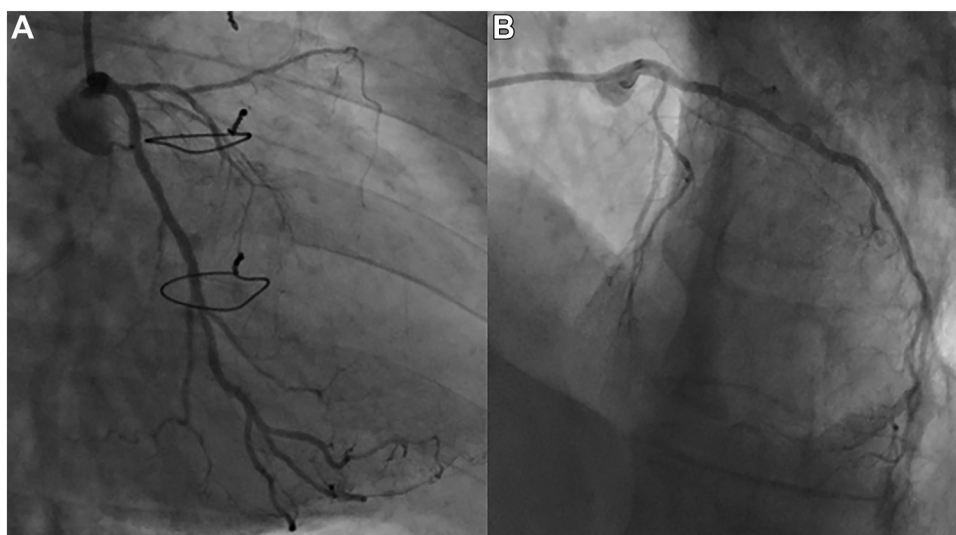


Figure 1. Coronary angiography in the (A) right anterior oblique—caudal projection and (B) left anterior oblique projection, demonstrating occlusion of the left anterior descending artery in the mid-segment with mild-moderate irregularities in the left circumflex artery.

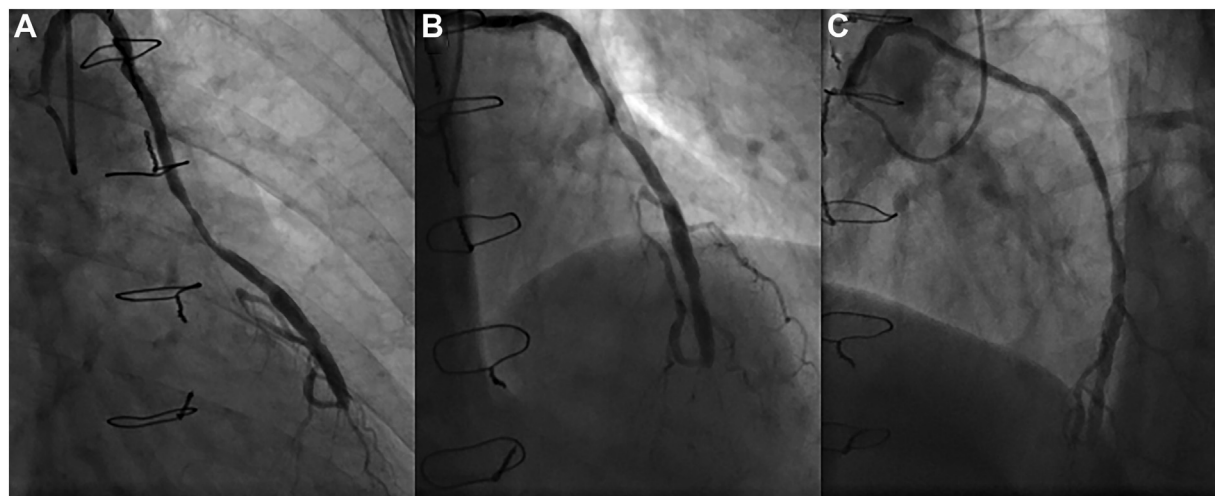


Figure 2. Angiography of saphenous vein graft to left anterior descending artery in the (A) right anterior oblique, (B) cranial, and (C) left anterior oblique—cranial projections demonstrating a patent graft with moderate degeneration in the mid-portion. The left anterior descending artery was occluded just distal to the saphenous vein graft anastomosis site.

SVG patency include no-touch SVG harvesting, the use of buffered SVG storage solutions, and postsurgery pharmacotherapy, including antiplatelet and cholesterol-lowering therapies.⁷ Y-composite graft (SAVE RITA) randomized clinical trial, which compared SVG (harvested using the no-touch technique) to RIMA use as a Y-composite graft off the in situ left internal mammary artery, found similar patency rates compared to RIMA at 10 years.⁸ Future research on improving bypass graft patency should focus on target-vessel characteristics, as well as bypass conduit harvesting techniques, and could utilize noninvasive imaging modalities to better understand graft patency. Clinicians should focus on the use of optimal medical therapy and aggressive risk-factor modification in post-CABG patients to improve long-term clinical outcomes.

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Disclosures

The authors have no conflicts of interest to disclose.

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