

# Sextuple Coronary Bypasses

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## History

A 60-year-old male patient, who had undergone multiple coronary artery bypass graft (CABG) and thromboendarterectomy (TEA) surgery 10 years ago, returned for a follow-up due to atypical chest pain. A coronary CT angiography (CTA) was performed for evaluation.

## Diagnosis

Coronary CTA images revealed three bypass grafts with sixfold coronary anastomoses. A left internal mammary artery (LIMA) graft, originating off the left subclavian artery, was anastomosed side-to-side to the second diagonal branch (D2) of the left anterior de-

scending artery (LAD) and end-to-side to the distal LAD. A free right internal mammary artery (RIMA) graft, originating from the anterior wall of the ascending aorta, had been laid over the main pulmonary artery and was anastomosed side-to-side to the middle of the first diagonal branch (D1) of the LAD and the first marginal branch (M1) of the left circumflex artery (LCX). A large third marginal (M3) branch of the LCX was also anastomosed end-to-side to the RIMA graft. A right saphenous vein graft (SVG), originating next to the free RIMA graft from the ascending aorta, was anastomosed end-to-end to the distal right coronary artery (RCA). All grafts and anastomoses remained patent, with

no evidence of stenosis or occlusion. The original left main coronary artery (LM), LAD, LCX and RCA showed severe stenoses caused by mixed plaques in the proximal segments.

## Comments

CABG surgery is performed to bypass the diseased coronary arteries using arterial or venous grafts. A sextuple bypass is considered to be the most intricate and surgically challenging, especially when a free arterial RIMA graft is reserved for complex anatomy and advanced diseases, such as in this case. The long-term clinical outcome depends upon the patency of the CABG, particularly that of the

vulnerable venous grafts. Coronary CTA is non-invasive and depicts the entire course of the grafts in both curved maximum intensity projection (MIP) and 3D cinematic volume rendering technique (cVRT). In CABG cases, it is however essential, as well as technically challenging, to provide good image quality for evaluation of the vessel lumen due to the large volume coverage and the presence of calcifications and clip material. In this case, the coronary CTA was performed with a SOMATOM X.cite, which provides both sophisticated hardware and intelligent software support. Optimal image quality can hence be achieved not only in standard patients but in exceptional cases as well. ●

The outcomes by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.

## Examination Protocol

Scanner		SOMATOM X.cite	
Scan area	Heart	Rotation time	0.3 s
Scan mode	Prospective ECG triggered sequential scan	Slice collimation	128 × 0.6 mm
Scan length	206 mm	Slice width	0.8 mm
Scan direction	Cranio-caudal	Reconstruction increment	0.3 mm
Scan time	10.3 s	Reconstruction kernel	Bv40 and Bv48 (ADMIRE 3)
Tube voltage	120 kV	Contrast	350 mg/mL
Effective mAs	112 mAs	Volume	70 mL + 50 mL saline
Dose modulation	CARE Dose4D	Flow rate	5 mL/s
CTDI <sub>vol</sub>	13.8 mGy	Start delay	Test bolus + 2 s
DLP	286 mGy cm		

