

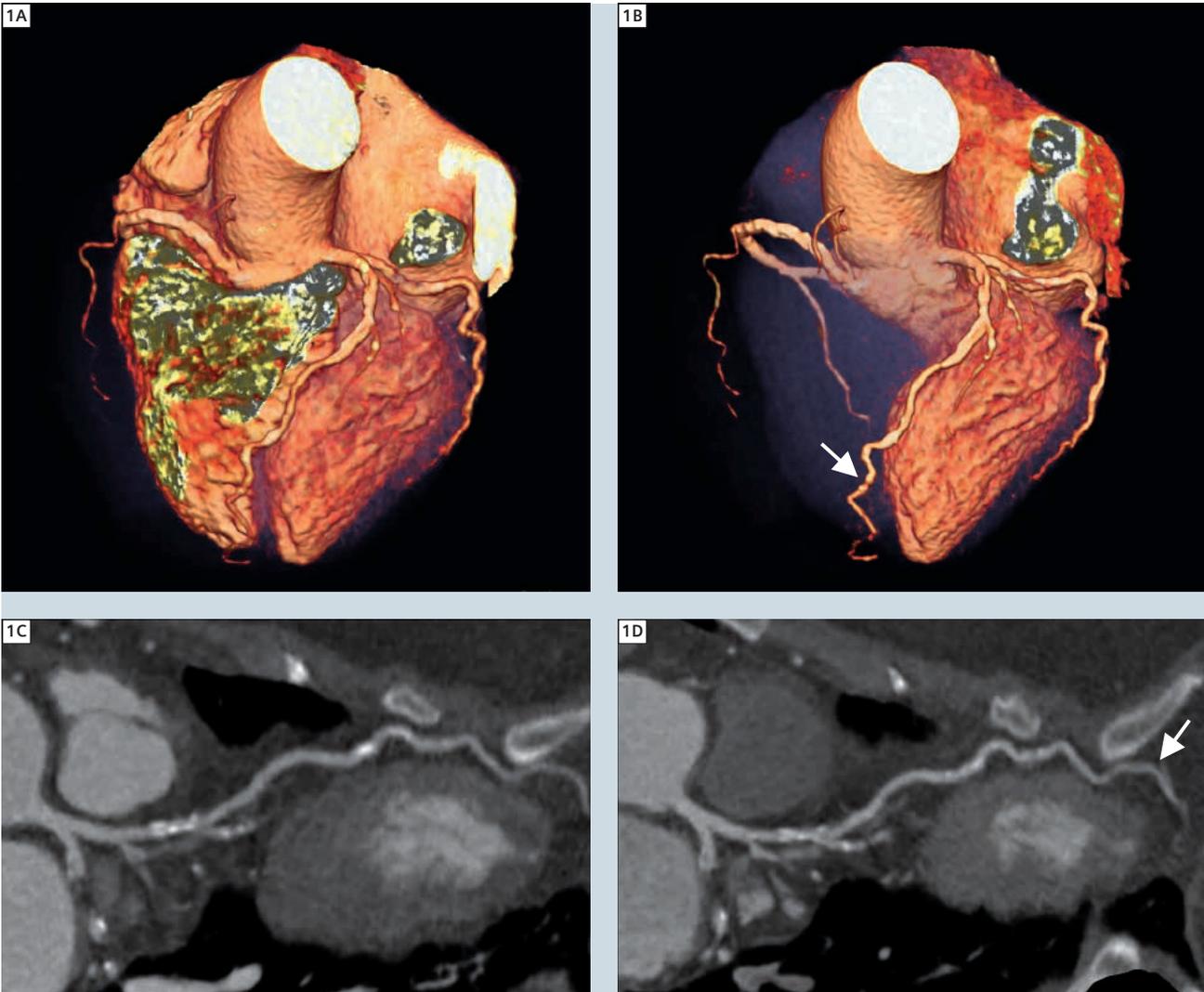
Case 6

Free-breathing Coronary CTA with Double Flash Spiral Protocol

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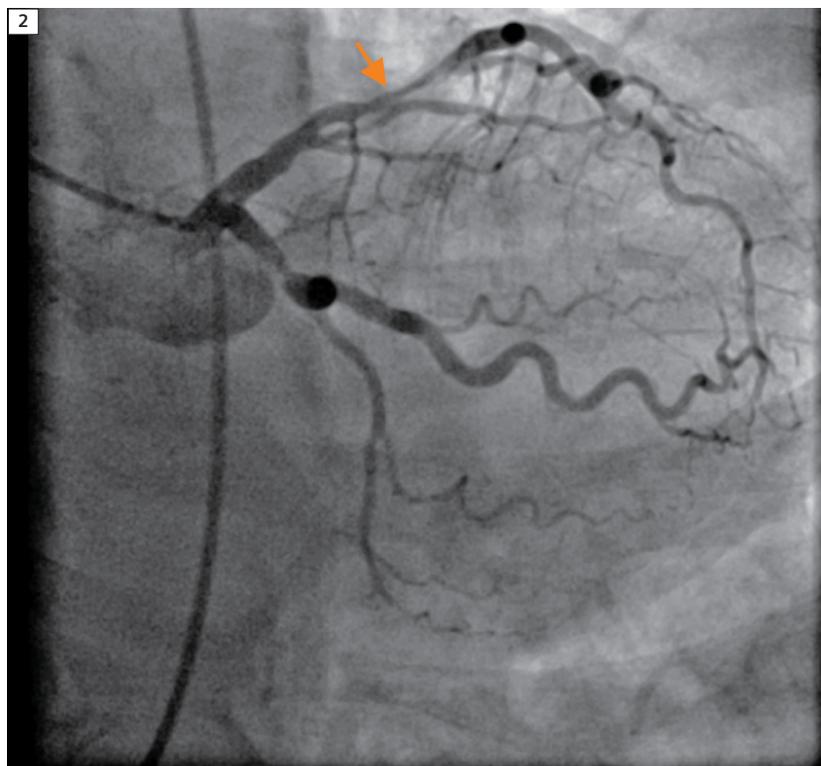
1 Double Flash Spiral scan with a single contrast injection in the same patient scanned with free-breathing. VRT (Fig. 1A) and curved MPR (Fig. 1C) images of 1st Flash Spiral scan which was free from breathing artifact and 2nd Flash Spiral scan (Figs. 1B and 1D) with one slight breathing artifact (arrows) in the distal LAD.

HISTORY

An 80-year-old female patient, with known hypertension, obesity, supra-ventricular ectopic, and supra-ventricular tachycardia, presented herself due to recent onset of chest discomfort. Coronary CTA was performed to exclude the presence of ischemic heart disease. Upon arrival, the patient had a heart rate of 61 beats per minute and could not hold her breath. Therefore the examination was conducted using the double Flash Spiral (prospectively ECG-triggered high-pitch mode) protocol under free-breathing. Two Flash Spiral scans were consecutively performed with a single bolus of intravenous contrast medium.

DIAGNOSIS

The patient's calcium score was 1,788 and all 3 arteries showed pathological changes. A severe stenosis was demonstrated in the mid left anterior descending artery (LAD) as well as a moderate stenosis in the proximal left circumflex (LCX) artery. There were mild stenoses in the left main, the proximal left LAD, the first diagonal artery, the right coronary artery and the first obtuse marginal artery. The posterior descending, postero-lateral and distal left anterior descending arteries were normal. Conventional angiography confirmed severe stenoses in the mid



2 The stenosis correlated with conventional angiogram.

LAD and proximal LCX. Percutaneous coronary intervention with implantation of a drug eluting stent in the mid LAD and LCX, after rotational atherectomy under intravascular ultrasound guidance, was successful.

COMMENTS

This case demonstrated that coronary CTA performed in patients who are unable to hold their breath with the double Flash Spiral protocol allows the diagnosis of coronary artery stenoses and can potentially simplify the planning of a coronary interventional procedure.

EXAMINATION PROTOCOL

Scanner	SOMATOM Definition Flash		
Scan area	Mid-pulmonary arteries to diaphragm	Pitch	3.4
Scan length	116 mm	Slice collimation	128 x 0.6 mm
Scan direction	Cranio-caudal	Slice width	0.75 mm
Scan time	0.39 s	Spatial Resolution	0.33 mm
Tube voltage	100 kV	Reconstruction increment	0.4 mm
Tube current	370 mAs	Reconstruction kernel	B26f & B46f
Dose modulation	No	Contrast	400 mg/mL
CTDI _{vol}	3.58 + 3.59 mGy	Volume	60 mL
DLP	117.86 mGy cm	Flow rate	5 mL/s
Effective dose	1.65 mSv	Start delay	Test bolus + 2 sec
Rotation time	0.28 sec		