

Multiple coronary stenoses secondary to atherosclerosis in an asymptomatic patient

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History

A 50-year-old male patient presented himself for a routine checkup. He has been a smoker for over 30 years (50 - 60 packs per year) and has been taking anti-depression pharmacotherapy for the past 20 years. His father, suffering from arterial hypertension, died from an acute myocardial infarction. The patient had a stress electrocardiogram (ECG) six years ago which showed no alterations. At the time of this checkup, he was asymptomatic and requested that a coronary CT angiography (cCTA) be performed.

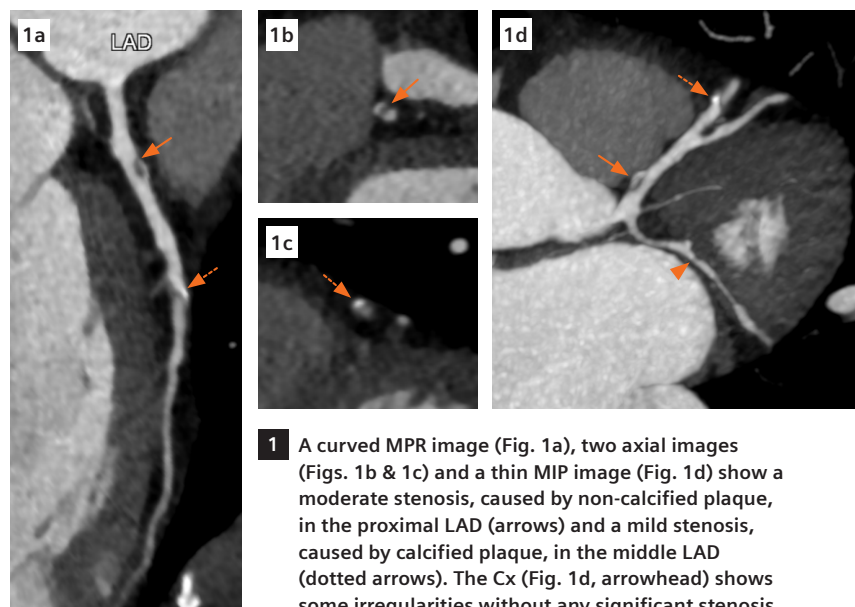
Comments

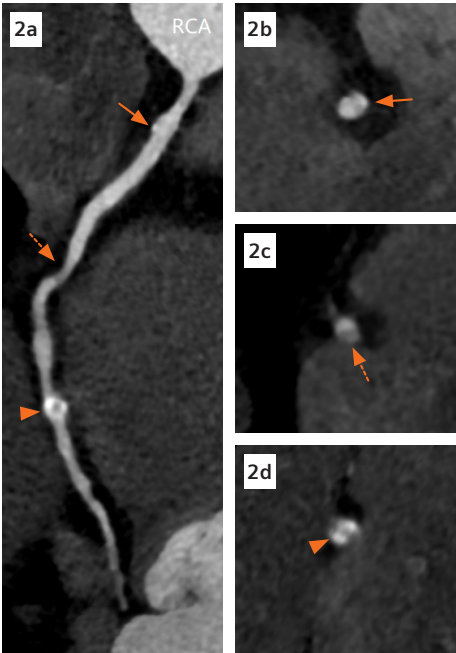
CAD is an ischemic heart disease most commonly caused by atherosclerosis. It can potentially lead to a myocardial infarction with high morbidity and mortality rates. CAD often goes undetected since many patients remain asymptomatic until the first cardiac event occurs. A recent study suggested that cCTA could be reliably used for the early detection of clinically significant CAD in asymptomatic male individuals, particularly those with risk factors and a positive family history. [1] This case presents a similar clinical

workup. A retrospective ECG gated spiral scanning is performed with 70 kV which enhances the image contrast while reducing the radiation dose and needing less contrast agent. This optimal kV setting can be applied to most cases since the operational output of the tube current allows up to 825 mA. The integrated mobile operation and fully automated workflow in the SOMATOM go platform grant the users great potential to deliver high performance – not only in routine cases, but also in more challenging ones.

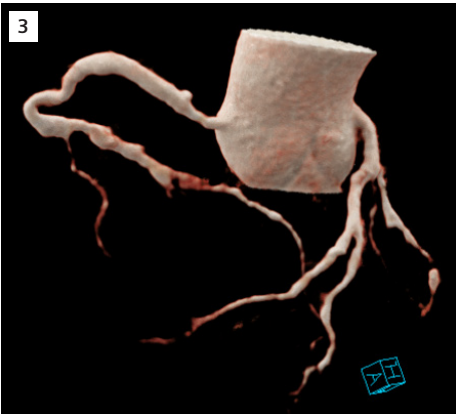
Diagnosis

cCTA images showed a right coronary artery (RCA) dominant system. A moderate stenosis, caused by non-calcified plaque, in the proximal left anterior descending artery (LAD), and a mild stenosis, caused by calcified plaque, in the middle LAD were seen. Three moderate stenoses in the proximal, middle and distal RCA, caused by calcified and non-calcified plaques, were also visualized. The circumflex artery (Cx) showed some irregularities along its course without any significant stenosis. The patient was referred to the cardiology department for consultation and thereafter began pharmacotherapy for coronary artery disease (CAD).





2 A curved MPR image (Fig. 2a), three axial images (Figs. 2b-2d) and a thin MIP image (Fig. 2e) show three moderate stenoses in the proximal (arrows), middle (dotted arrows) and distal (arrow-heads) RCA, caused by calcified and non-calcified plaques.



3 A cVRT image shows a three-dimensional coronary tree.

The fast acquisition time allows for extended clinical capabilities and optimal image quality with minimized motion artifacts. ●

References
[1] Hatzidakis A et al., CT coronary angiography in asymptomatic male patients with high atherosclerosis risk: Is it justified? Hellenic Journal of Cardiology. <https://doi.org/10.1016/j.hjc.2020.04.004>

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

Examination Protocol

Scanner	SOMATOM go.All
Scan area	Heart
Scan mode	Retrospective ECG-gated Spiral Scan
Scan length	128 mm
Scan direction	Cranio-caudal
Scan time	9.5 s
Tube voltage	70 kV
Effective mAs	99 mAs
Dose modulation	CARE Dose4D
CTDI _{vol}	17.6 mGy
DLP	290 mGy*cm
Rotation time	0.33 s
Pitch	0.2
Slice collimation	32 X 0.7mm
Slice width	0.8 mm
Reconstruction increment	0.5 mm
Reconstruction kernel	BV36
Heart rate	61 - 68 bpm
Contrast	370 mg/mL
Volume	80 mL + 40 mL saline
Flow rate	6 mL/s
Start delay	22 s defined by test bolus