

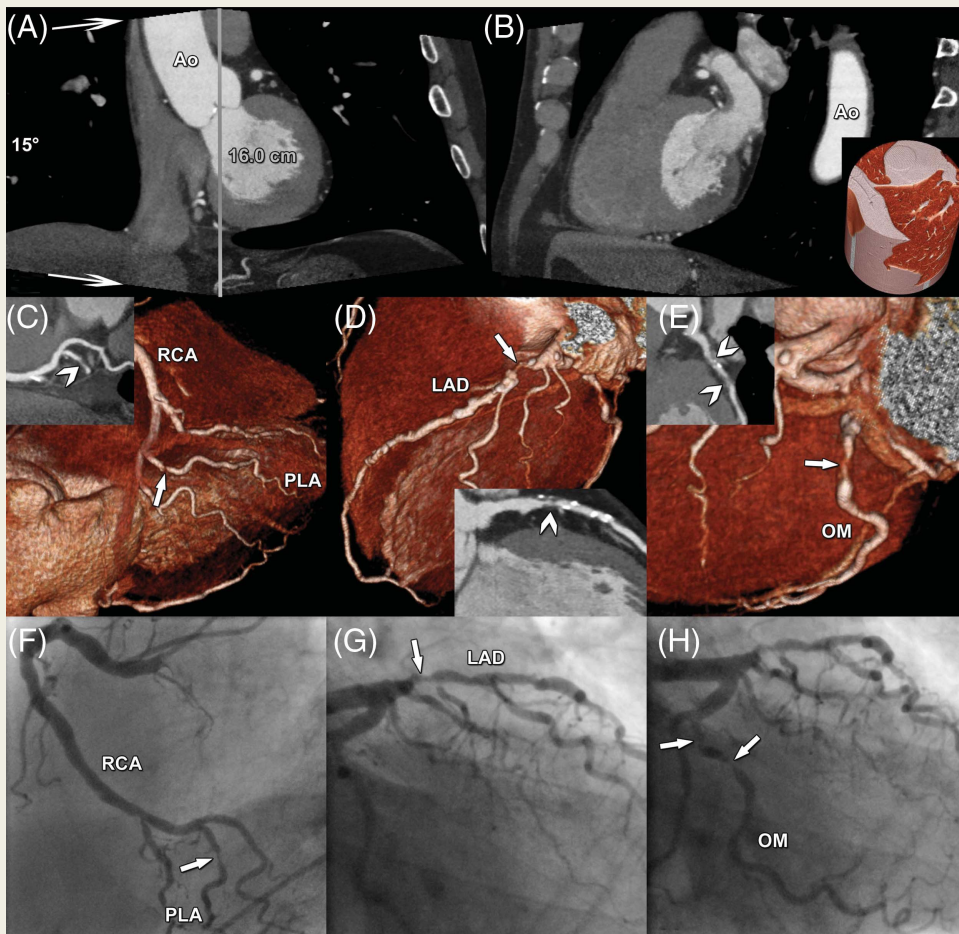
Three-vessel coronary artery disease examined with 320-slice computed tomography coronary angiography

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A 61-year-old man with atypical angina pectoris showed inferolateral ischaemia on exercise single-photon emission computed tomography (SPECT) myocardial perfusion imaging. Electrocardiogram (ECG)-gated multi-slice computed tomography (MSCT, Aquilion ONE, Toshiba Medical Systems) with 320 simultaneous detector rows (each 0.5 mm wide) was performed at 120 kV and 450 mA after intravenous injection of 80 mL of an iodinated contrast agent (iobitridol, Xenetix 350, Guerbet). This very recently developed MSCT scanner covers 16.0 cm (Panel A, frontal view) in a single rotation and heart beat thus virtually eliminating artefacts arising from breathing or irregular cardiac activity. The volume acquired with a single X-ray shot looks like a cylinder (insets in Panel B, the latter



being a lateral view, Ao=aorta) bounded by two circular cones (the angle of the X-ray beam is 15°, Panels A and B). Therefore, this new CT scanner that will become commercially available in 2008 is also referred to as 'cylindrical wide-area detector CT'. In our patient, three-dimensional volume-rendered reconstructions (Panels C–E) as well as curved multi-planar reformations along the vessel centrelines (insets in Panels C–E) clearly demonstrate significant stenoses (arrows) in all three main coronary arteries. The stenosis in the posterolateral artery (PLA) was caused by a purely non-calcified plaque (inset in Panel C, arrowhead), whereas the stenoses in the left anterior descending (LAD) and obtuse marginal artery (OM) were caused by plaques with calcified and non-calcified components (insets in Panels D and E, arrowheads). There was excellent correlation with subsequently performed conventional coronary angiography (arrows in Panels F–H), during which the patient immediately underwent stent placement for the OM artery stenoses (responsible for the ischemia on SPECT). Further interventional procedures are scheduled. It is important to note that 320-slice coronary CT angiography dispenses with overscanning and overranging and thus has the potential to reduce the radiation exposure by a factor of 2–4 to <5 mSv as in the patient presented here.