


Clinical vignette

Demonstration of clinically silent plaque rupture by dual-source computed tomography

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A 69-year-old woman was admitted because of atypical chest pain. She had hyperlipidaemia and diabetes. ECG and echocardiography showed no abnormal finding. Noninvasive coronary angiography was performed using dual-source computed tomography (DSCT; Somatom Definition, Siemens Medical Solution, Forchheim, Germany). 70 ml of contrast agent was used at 5 ml/s. The collimation was 2×64×0.6 mm, rotation time was 330 ms, temporal resolution was 83 ms. Cross-sectional images were reconstructed with 0.75 mm slice thickness and 0.4 mm increment. DSCT revealed high-grade stenosis in the middle segment of left anterior descending coronary artery as well as exulceration with a partly calcified atherosclerotic lesion of the left main coronary artery immediately proximal to the bifurcation (Panel A). ‘Plaque map’ analysis which was a comprehensive colour image according to CT number was performed (Panel B). It revealed that within the atherosclerotic plaque material, an enhanced cavity (*) of ruptured plaque forming a double lumen (Panel B). Images showed an eccentric mild stenotic area with a CT attenuation below 70 HU, suggesting fatty plaque and/or thrombus. Some spots under 0 HU (white arrows), were thought to be lipid pools. Some spots of calcification were also detected (black arrows). Invasive coronary angiography demonstrated ruptured plaque on the same position (Panel C). In those findings, the plaque was ruptured silently.

Panel A. Curved multi-planar reformation image of left main coronary artery using DSCT.
Panel B. Consequent images of cross-sectional images of the culprit from the proximal to the distal lesion (upper panels) and Plaque Map (lower panels).
Panel C. Invasive coronary angiography showed moderate stenosis and an exulceration (arrow) in the left main coronary artery, corresponded to DSCT findings.