

In-vivo characterisation of coronary atherosclerosis with optical coherence tomography

The burden of atherosclerosis has triggered intense interest in the study of “vulnerable” plaques at high risk of rupture. Optical coherence tomography (OCT) has recently contributed to the in-vivo visualisation of plaque, providing unique insights into the atherosclerotic process, previously only attainable through postmortem examination. This technique uses near infrared light and an optical imaging wire attached to a patient interface unit with a pullback speed of up to 3.0 mm/s.

In this patient, a 62-year-old man with treatment-resistant dyslipidaemia and stable angina, coronary angiography revealed possible non-flow-limiting plaque in the proximal left anterior descending coronary artery (arrow; Figure, A). OCT images confirmed extensive non-flow-limiting plaque (Figure, B–D), consisting of lipid (L)-rich areas with characteristic low reflectivity and homogenous appearance (Figure, B and C), and a fibrous (F) plaque with a high reflective and homogenous appearance (Figure, B). The images revealed almost circumferential thin cap fibroatheroma (TCFA; Figure, D), a marker of plaque vulnerability, as well as the plaque's necrotic core (NC; Figure D). This case demonstrates the potential of OCT to visualise plaque and detect TCFA. This is particularly useful in stable patients in whom aggressive management of risk factors might prevent future adverse events.

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