Spontaneous coronary artery dissection: diagnosis by optical coherence tomography

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Spontaneous coronary artery dissections (SCAD) are rare but frequently present as an acute myocardial infarction. The diagnosis of SCAD remains a major challenge. Coronary angiography provides only information of lumen compromise and indirect visualization of the intimal flap. The value of optical coherence tomography (OCT) in the diagnosis of this entity has not been reported.

A 50-year-old woman without coronary risk factors presented with an ST-segment elevation anterior myocardial infarction that was treated with thrombolysis. Coronary angiography, performed 48 h later, revealed an occlusive lesion (100%) in the proximal left anterior descending coronary artery with a distal vessel that poorly filled from heterocoronary collateral circulation. No angiographic images of dissections could be recognized. OCT, however, readily disclosed a SCAD affecting most of the vessel, Figure 1 [superior panel, A–D (from distal to proximal vessel), where asterisks represent wire artefact]. OCT accurately visualized (i) the affected coronary wall along the entire vessel length, (ii) the thickness and circumferential distribution of the intimo-medial dissection flap, (iii) the variable extent of lumen compromise (slit-light lumen in some segments) and the false lumen (FL), (iv) the emergence of all involved side-branches (SB) from the true lumen, and (v) the precise location of a proximal, confined, intimal tear (entry door) (arrows). After stent implantation [Figure 1, lower panel, E–H (from distal to proximal vessel), where asterisks represent wire artefact], OCT revealed a well-expanded stent (ST), fully apposed against an apparently normal vessel wall and a small, residual, non-communicating dissection (intramural haematoma) with an improved coronary lumen at the distal vessel.

Spontaneous coronary artery dissections should be suspected in young women without classical coronary risk factors presenting with an acute coronary syndrome. The angiographic diagnosis of this entity may be very difficult indeed and always relies in the identification of an intimal flap. However, precise identification of the coronary entry door, total length of affected coronary segment, differentiation of the true from the false lumen, and visualization of the origin of the potentially involved side branches may be critical when a coronary intervention is planned. After the intervention, definitive visualization of the complete sealing of the entry door, the full apposition of the stent struts against the wall, and the residual non-communicating haematoma are highly reassuring. Our findings suggest that the unique spatial resolution provided by OCT (10 μm) might be particularly valuable in the decision-making process involved in the management of patients suffering from this rare entity.

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