Angiographically silent very late stent thrombosis detected by optical coherence tomography in association with peri-stent staining and multiple interstrut cavities

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A 56-year-old man had unstable angina 7 years previously, which was treated with two sirolimus-eluting stents (SESs) in the proximal and mid-left anterior descending artery (LAD) and one SES in a diagonal branch. Five years later, he developed stent thrombosis in the mid-LAD SES that required treatment with two additional everolimus-eluting stents (Panel A, lines outline stents). Intravascular ultrasound confirmed that all stents were well expanded and apposed (Supplementary material online, Movie S1). He now presents with a non-ST-elevation myocardial infarction. Coronary angiography demonstrated TIMI 3 flow with patent stents, but there were several new regions of peri-stent staining (PSS) involving both the proximal and mid-LAD stents (arrows Panel B and Supplementary material online, Movie S2). Optical coherence tomography (OCT) demonstrated a large, predominantly red, thrombus (arrows), multiple interstrut cavities (MICs) (asterisk), and focal incomplete stent apposition (ISA) in the proximal and mid-LAD stents (Panels C–F and Supplementary material online, Movies S3 and S4).

Very late stent thrombosis (VLST, >1 year after stent placement) typically presents with an acute myocardial infarction and angiographic evidence of occlusive thrombus. The unique observations from our case are that: (i) VLST may present in the absence of angiographically visible thrombus which can be detected by OCT; (ii) PSS can develop many years after drug-eluting stent implantation and this finding has been associated with an increased risk of VLST; and (iii) PSS is due to contrast entering MICs which can be detected by OCT. MICs likely develop due to an inflammatory response, perhaps due to hypersensitivity to the polymer in the stent, leading to the destruction of the intima/media and the subsequent loss of elastic integrity. We speculate that MICs may be a precursor to late-acquired ISA, as both findings coexisted in close proximity within the stents in our patient.

Supplementary data are available at European Heart Journal — Cardiovascular Imaging online.

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