698 Acute coronary syndrome in neoatherosclerosis with major stent malapposition and OCT-guided PCI

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Aims: Due to its bidimensional nature, angiography is not always sufficient to accurately define coronary lesions, in particular when they are ambiguous or indeterminate. Intracoronary imaging, such as intravascular ultrasound or optical coherence tomography (OCT), is often useful in these cases to better characterize the ambiguous angiographic images, to identify the culprit lesion during acute coronary syndrome (ACS) and to guide percutaneous coronary intervention (PCI).

Methods and results: We report a case of a 61-year-old male with multiple cardiovascular risk factors and a previous ST-segment elevation myocardial infarction treated by PCI of the right coronary artery (RCA) about 7 years before, wo was admitted to our emergency department after acute onset chest pain. At the time of admission, his ECG was normal and cardiac troponin was below the upper reference limit of normality with positive molecular SARS-CoV-2 diagnostic test. Echocardiogram disclosed a mild left ventricular dysfunction with inferior wall hypokinesia. Coronary angiography showed a moderate in-stent restenosis at mid RCA and a hazy, undetermined image at the proximal edge of the previously implanted stent. Left coronary artery angiography showed only diffuse atherosclerotic disease without significant stenoses and a myocardial bridge at the mid tract of left anterior descending artery. OCT pullback of RCA to better characterize the undetermined lesions shown by angiography. OCT revealed significant neointima hyperplasia and a focal area of neoatherosclerosis with unstable features (fissure/microthrombi) at mid RCA. Severe stent strut malapposition embedded neointimal hyperplasia was observed at the proximal stent edge, resulting in 'dual' lumen appearance. The two

lesions were treated with a single 3.5/48 mm everolimus-eluting stent (stent-in-stent), which was post-dilated with a 3.5/20 mm non-compliant balloon (18 atm) in the mid-to-distal segments, and 4.5/15 mm (16 atm) and 5.0/8 mm (14 atm) semi-compliant balloons in the proximal stent segment. Post-PCI OCT imaging confirmed good stent expansion and apposition. Our case demonstrates the utility of OCT in clarifying the aetiology of ambiguous angiographic lesions and as a guide for PCI. Indeed, the 'hazy' appearance on the angiograms corresponded to the major stent malapposition covered by neointima disclosed by OCT as a 'dual-lumen'. Of note, OCT allowed to confirm the correct guidewire position in the 'true' lumen preventing a crush of the previously implanted stent. OCT was also useful as a diagnostic modality for the identification and characterization of the mechanism underlying the ACS (neoatherosclerosis instability).

Conclusions: Due to its unprecedented spatial resolution, OCT enables an 'optical biopsy' of the coronary artery wall and intrastent tissue. Therefore, OCT imaging should be considered when lesions are ambiguous or indetermined by coronary angiography to guide the diagnosis and treatments of ACS patients. OCT imaging is also useful to guide stenting and to optimize PCI result, and its impact on clinical outcome is under investigation in large randomized clinical trials.