Optical coherence tomography-guided percutaneous coronary intervention in a myocardial infarction patient. One more argument for a wider use of now reimbursed optical coherence tomography

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Optical coherence tomography (OCT) is a modern intravascular imaging technique that enables high-definition visualization of coronary plaque morphology and its length, as well as precise assessment of coronary artery diameter while planning a percutaneous coronary intervention (PCI). Moreover, OCT is highly effective in the evaluation of the PCI results [1]. As has been demonstrated in the multicenter CLI-OPCI registry, suboptimal stent deployment confirmed with OCT was associated with unfavorable clinical outcomes [2]. These findings contributed to the development of a multicenter, prospective, observational LightLab initiative. Its main goals are to evaluate the impact of a routine OCT clinical implementation on the physician decision-making process and improving the safety and efficiency of modern cath labs [3].

We present a 53-year-old man, with hypercholesterolemia and a history of smoking, who was hospitalized for non-ST-segment elevation myocardial infarction (NSTEMI). The patient has complained of chest pain during increased physical activity 3 weeks before admission. On the day of admission, he reported severe retrosternal chest pain radiating to the back. Electrocardiography showed negative T waves in aVL and precordial leads. Initial laboratory tests demonstrated a mildly elevated high-sensitive troponin T (peak at 0.049 ng/ml, upper limit of normal of 0.014 ng/ml). A transthoracic echocardiogram revealed preserved global left ventricular systolic function with hypokinesis of the anterior wall and interventricular septum.

The coronary angiography performed immediately after admission showed significant narrowing in the ostium of the left anterior descending artery (LAD) and only a discrete and smooth contrast deficit in the distal part of the left main (LM) (Figure 1A). Baseline OCT images obtained with FastView imaging catheter (Lunawave OFDI System, Terumo, Tokyo, Japan, Figure 1B) revealed eccentric, soft, lipid-rich atherosclerotic plaque beginning in the middle part of the LM, encompassing 120 degrees in circumference, and involving LM bifurcation. The lipid plaque passed from the distal LM to the proximal LAD with visible plaque rupture just after the LAD origin (Figure 1C). The total length of the lesion was 26 mm with a distal reference of about 4.0 mm. According to Finet's law, LM should have a reference diameter of 4.1–4.2 mm. Directly implanted stent Xience Pro 4.0/28 mm completely covered the whole plaque. Proximal optimization technique was performed with a 4.0/12 mm non-compliant balloon. Post-PCI OCT imaging and angiography confirmed a good apposition of the stent, lack of residual edge dissection, and widely open circumflex

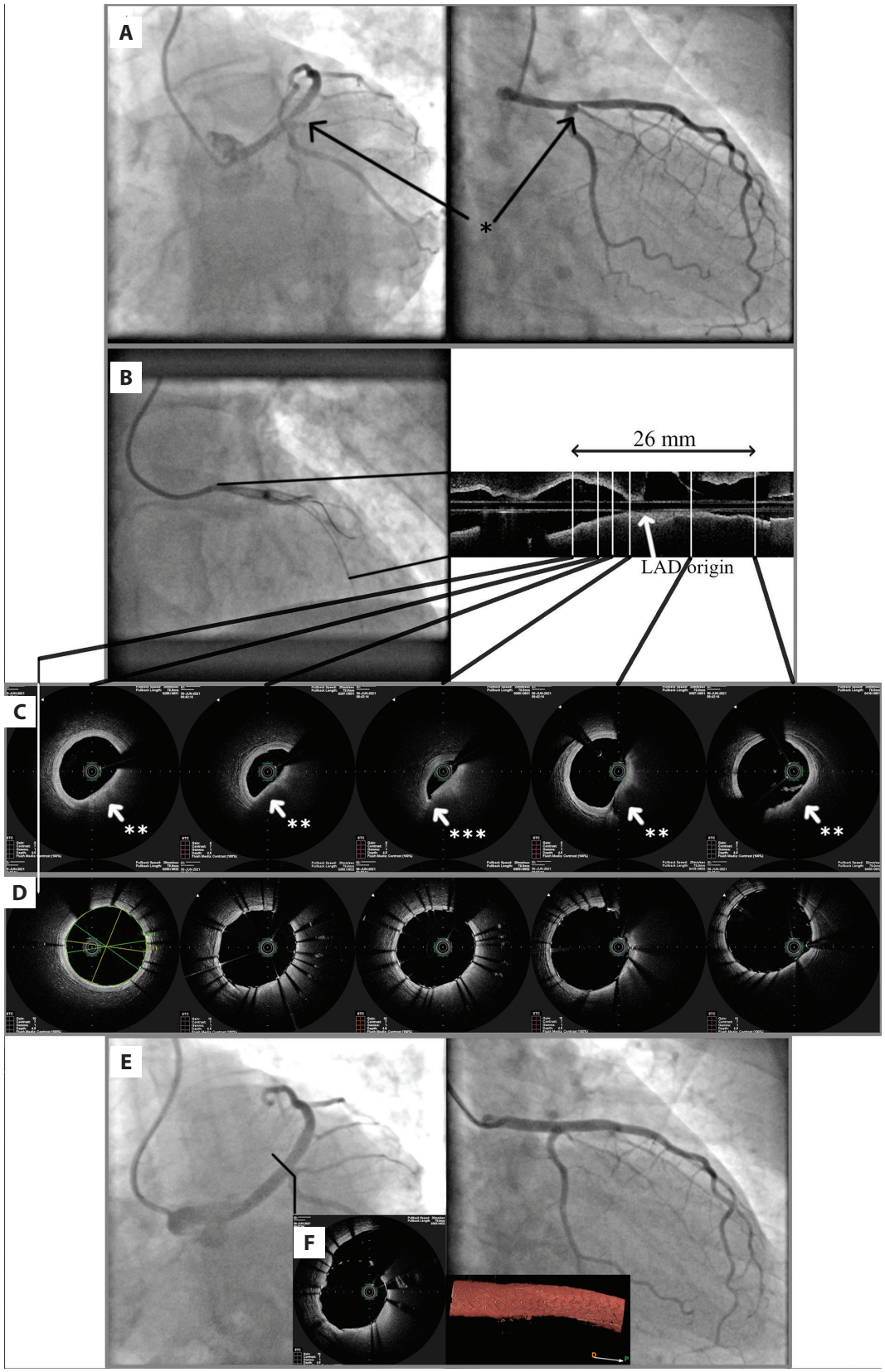

Figure 1. A. Tight stenosis in the ostium of the LAD (*) and only discrete and smooth contrast deficit in the distal part of the LM on angiography. **B.** OCT pullback and corresponding angiography. **C.** The infarct-related artery before PCI in OCT. The eccentric, soft, lipid-rich atherosclerotic plaque beginning in the middle part of the LM, involving LM bifurcation and proximal LAD (**) with plaque rupture just after the LAD origin (***). **D–F.** PCI result on OCT and angiography. Good apposition of the stent, lack of residual edge dissection, and widely open circumflex artery, as well as stent's struts

Abbreviations: LAD, left anterior descending artery; LM, left main; OCT, optical coherence tomography; PCI, percutaneous coronary intervention

artery not requiring a complex bifurcation procedure (Figure 1D–F). Following PCI, the patient did not report chest pain and was discharged four days later with qualification to the Coordinated Care in Myocardial Infarction Program (KOS-MI) [4].

In this case, OCT provided crucial information useful for both planning and optimization of the procedure. The preliminary data from the LightLab initiative suggest that OCT influenced PCI decision-making in as many as 88% of lesions, both pre- and post-PCI [3]. Unfortunately, according to data from the ORPKI registry, OCT has been applied only in 0.3% of all procedures in 2020 [5]. The currently introduced OCT reimbursement in Poland will undoubtedly improve the availability of this invasive imaging modality, and this case report is a strong argument confirming the validity of its wider use.

Article information

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