Kardiologia Polska 2014; 72, 2: 205; DOI: 10.5603/KP.2014.0036 ISSN 0022–9032

STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

Invisible by angiography: the role of optical coherence tomography

Angioplastyka pnia lewej tętnicy wieńcowej: rola optycznej tomografii koherentnej w obserwacji odległej

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Limited resolution and the 'luminographical' nature of invasive angiography can lead to misdiagnosis. Multidetector computed tomography and intravascular imaging tools can play a complementary role to angiography. A 63-year-old male, ten months after coronary artery bypass grafting for significant left main (LM) stenosis (Fig. 1A), was referred for control angiography due to recurrent angina. This revealed that all grafts were occluded. Thus, angiographically successful percutaneous coronary intervention (PCI) of the LM bifurcation and PCI of proximal segment of the left circumflex artery (LCx) was carried out. A 3.5 × 12 mm everolimus eluting stent (EES) was implanted to the mid-LCx. Next, a 3.0 × 28 mm EES was inserted across the distal LM segment and proximal left ascending artery (LAD) segment. A third 3.5 × 16 mm EES was implanted from the LM to the LCx in a Culotte-like fashion. Final kissing balloon (KB) post-dilatation was performed. Neither the first control angiography done two months after LM PCI, nor the next one at 12 month follow-up, revealed any suspicious restenotic lesions (Fig. 1B). However, computed tomography angiography (CTA) strongly suggested floating stent struts in the LM (Fig. 1C, D). Thus, optical coherence tomography (OCT) was performed (Fig. 2), which showed a short, ring-like lesion at the LAD ostium with the presence of a very few malapposed stent struts and neointimal proliferation outside the malaposed struts (Fig. 2D–F). Complex balloon angioplasty followed by KB post-dilatation was carried out. Final OCT showed apposed struts in the LM and torn restenotic ring with improvement in the minimal lumen area at the LAD ostium (Fig. 3C, D). However, a small tissue prolapse was still present in the LAD (Fig. 3A, B). No additional stent was implanted to cover the remaining flap. Bifurcation stenting is expected to induce greater stent deformity and malapposition. Culotte-like stenting can leave many malapposed struts in the flow divider region, despite consistent KB post-dilatation. It may be that a malapposed strut together with the tissue injury could have triggered the formation of such an unusual restenotic lesion. This case emphasises the crucial role of intravascular technique guidance for LM PCI, which was not used in the first procedure. Secondly, little is known about the clinical relevance of OCT detected tissue dissection, as in this case at the end of the re-PCI. Covering the short floating flap (which does not compromise significantly the LAD lumen), in our case with an additional layer of stent, is controversial.

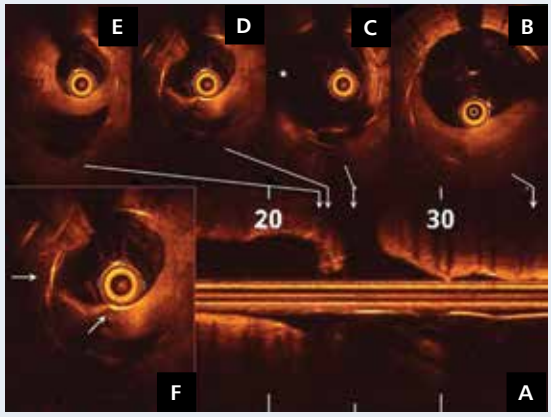

Figure 2. OCT images before re-PCI; **A**. Restenotic flap in longitudinal view at the LAD ostium; **B**. Neointimal proliferation in the proximal pole of the LM stent; **C**. LM bifurcation with the LCx take-off (asterisk); **D**. Ring-like lesion at the LAD ostium with single malapposed struts; **E**. Next cross-section of the lesion; **F**. Magnification of image 'D'. Neointimal proliferation outside the malapposed struts (arrows)

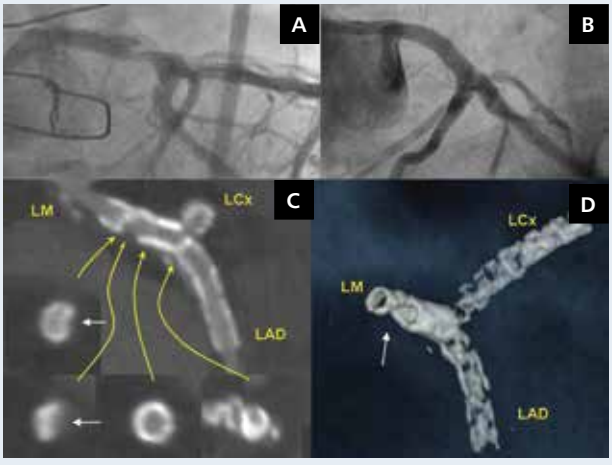

Figure 1. **A**. Significant LM stenosis with ruptured plaque; **B**. Ten month follow-up after PCI with apparently good result; **C**, **D**. CTA of the stented LM bifurcation.

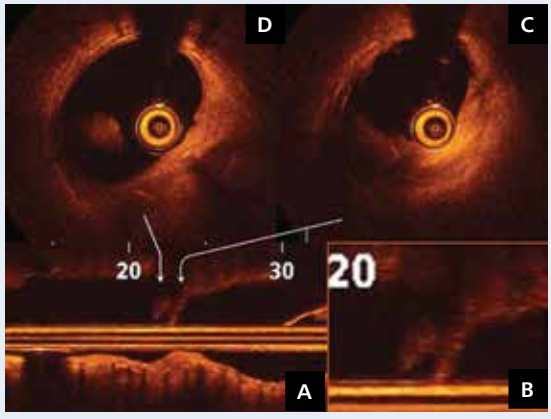

Figure 3. OCT images after re-PCI, **A**. Remaining flap; **B**. Magnification of image 'A'; **C**, **D**. Corresponding cross-sections

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Conflict of interest: *none declared*