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STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

# A case of discordance between fractional and coronary flow reserve in functional assessment of an isolated left anterior descending artery lesion

## Niezgodność między cząstkową i wieńcową rezerwą przepływu w ocenie czynnościowej istotności izolowanej zmiany w LAD — przypadek kliniczny

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We present a case of a 60-year-old male with typical CCS 2 angina, poorly controlled hypertension, normal left ventricular function, and positive electrocardiogram stress test (2.44 mm ST-segment depression in V4–V6, 10 METs). Considering the presence of typical angina, we decided to perform coronary angiography. It revealed an intermediate lesion in the middle segment of the left anterior descending artery (LAD) and benign myocardial bridging (luminal narrowing during systole less than 50%) (Fig. 1). There was no stenosis in the left circumflex (Cx) and the right coronary artery was recessive, of a small calibre, and without stenoses. To verify the functional significance of the intermediate stenosis in LAD fractional (FFR) and coronary (CFR) flow reserve were assessed at the same time (Certus Pressure Wire, St. Jude Medical). Baseline Pd to Pa was 0.92. Hyperaemia was induced with intravenous infusion of adenosine (at 140 $\mu$g/kg/min). The FFR value was 0.68 — clearly below the 0.80 threshold for revascularisation. The index of microcirculatory resistance (IMR) was normal, demonstrating preserved function of coronary microcirculation. Notwithstanding, the CFR value was 2.9 indicating preserved flow reserve (Fig. 2). The same parameters were assessed in the Cx artery: Pd/Pa 0.98, FFR 0.94, IMR 23, and CFR 2.4 — all within normal limits for patients with coronary artery disease. Three weeks later the patient underwent noninvasive myocardial perfusion imaging (single photon emission computed tomography myocardial perfusion imaging [SPECT-MPI]). It showed minimally diminished CFR localised in the basal and middle segments of the inferolateral wall as well as the apical segment of the lateral wall — less than 10% of total left ventricle myocardial area (Fig. 3). Although the FFR value justified revascularisation of the LAD territory, the patient was treated conservatively because invasive CFR and SPECT-MPI demonstrated the absence of significant ischaemia. After modification of antihypertensive therapy and achieving good control of arterial pressure, the patient remains free from angina. According to the literature, discordance between FFR and CFR is observed in about 30% of cases. This is a topic of lively debate. Thorough analyses of the DEFER, FAME, and FAME 2 studies suggest that FFR measurements should be regarded as an "ischaemic continuum" rather than in a dichotomous "to treat/not to treat" manner. It is known from coronary haemodynamics that pressure drop across the stenosis is larger (i.e. FFR value smaller) as flow is increasing. Therefore, when coronary microcirculation is able to compensate stenosis in the epicardial part of the coronary artery and CFR is preserved, then significant ischaemia is probably absent. Some studies indicate that the risk of adverse events is low in such situations. The ongoing DEFINE-FLOW trial is aimed to establish whether lesions with FFR ≤ 0.80 and CFR ≥ 2.0 might be safely treated with medical therapy only.

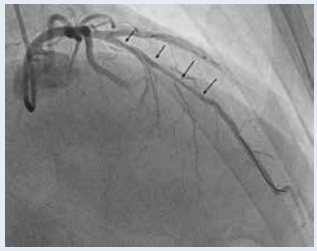

Figure 1. Intermediate lesion and myocardial bridging in the LAD (arrows)

Figure 2. The result of FFR, CFR, and IMR measurements in the LAD

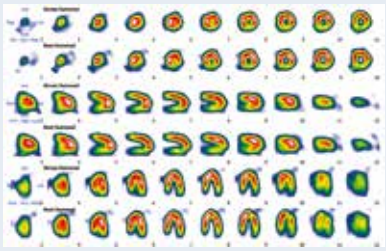

Figure 3. SPECT-MPI showing merely small impairment of myocardial perfusion during hyperaemia (images 8–12, two lower rows)

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***Conflict of interest:*** *none declared*