

Occlusion of the left anterior descending coronary artery following a negative fractional flow reserve study. Failure or limit of a “gold standard” method?

Niedrożność gałęzi przedniej zstępującej wkrótce po badaniu cząstkowej rezerwy przepływu z wynikiem negatywnym. Ograniczenie czy niedoskonałość metody uznanej za referencyjną?

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A 59-year-old man with a history of arterial hypertension and hyperlipidaemia was referred for coronary angiography because of non-typical chest discomfort and positive electrocardiography treadmill test. The only lesion found on angiography was a single 60% stenosis in the mid left anterior descending (LAD) coronary artery near the origin of a diagonal branch (Fig. 1A). The result of a fractional flow reserve (FFR) study (3 min of adenosine infusion 140 µg/kg) of the lesion was 0.9, and the patient was qualified to further medical treatment with augmentation of rosuvastatin at 30 mg daily (Fig. 1B). Four months later the patient progressively developed exacerbation of angina with typical chest pains. After the next three months of medical treatment he was referred for a repeated invasive study because of typical exertional angina and limitation of his normal activity. On angiography the functional occlusion with TIMI 1 flow of the LAD lesion was found (Fig. 2A), and successful angioplasty of the LAD with DES stent and balloon angioplasty of the origin of diagonal artery were performed (Fig. 2B, C). The patient was discharged a day later, and at the one-month follow-up visit he was asymptomatic with normal left ventricular function. Each diagnostic method has its limitations and false negative cases. The important limitation of FFR is that it cannot distinguish between stable smooth lesions and unstable plaques prone to rapid progression with the same degree of stenosis and similar flow limitation. Physicians should be especially aware of the limitations of methods considered as a “gold standard”. An ideal method of coronary lesion evaluation still does not exist, and further research of a combination of the functional (FFR) and morphological (IVUS/OCT) evaluation as well as continuous guideline development and improvement is needed.

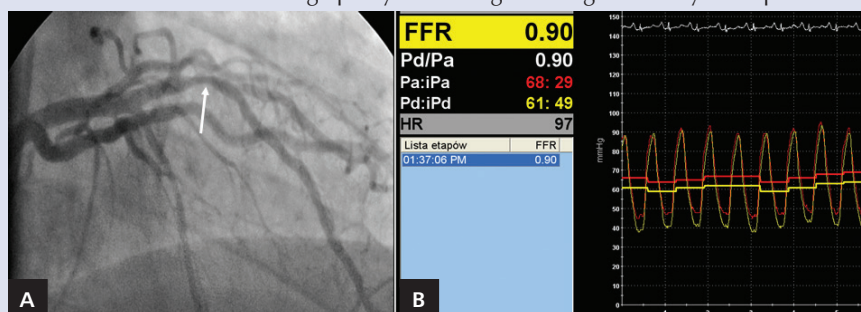


Figure 1. March 2014; **A.** Borderline 60% stenosis in mid left anterior descending coronary artery (arrow); **B.** The negative result of fractional flow reserve (FFR) = 0.9 after 3 min of adenosine infusion 140 µg/kg

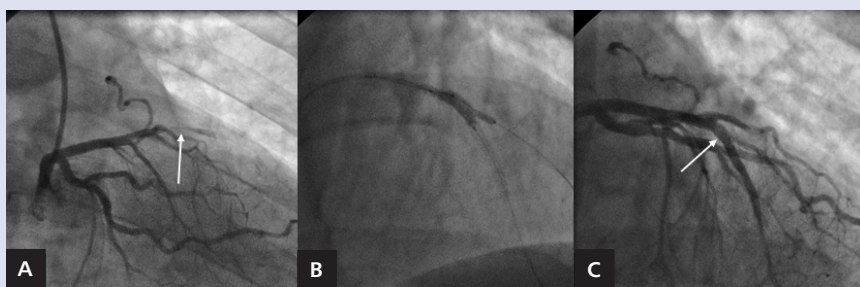


Figure 2. October 2014; **A.** Critical progression of the left anterior descending (LAD) coronary artery stenosis with TIMI 1 flow (arrow); **B.** Immediate angioplasty of LAD with stent implantation and balloon in diagonal ostium; **C.** The angiographic result of successful LAD/diagonal angioplasty (arrow)

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Conflict of interest: none declared

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