Percutaneous coronary intervention of left anterior descending artery due to in-stent restenosis after positive dobutamine stress echocardiography

Mihajlo Kovačić*,
Marko Hranilović

Čakovec County Hospital,
Čakovec, Croatia

KEYWORDS: percutaneous coronary intervention, in-stent restenosis, stress echocardiography, strain and strain rate, transradial approach.

CITATION: Cardiol Croat. 2018;13(1-2):41-42. | <https://doi.org/10.15836/ccar2018.41>

***ADDRESS FOR CORRESPONDENCE:** Mihajlo Kovačić, Županijska bolnica Čakovec, I.G.Kovačića 1E, HR-40000 Čakovec, Croatia. / Phone: +385-98-266-774 / E-mail: mihajlo1983@gmail.com

ORCID: Mihajlo Kovačić, <https://orcid.org/0000-0002-2577-9474> • Marko Hranilović, <https://orcid.org/0000-0001-6522-5882>

Introduction: Dobutamine stress echocardiography is based on the causal relationship between induced myocardial ischemia and left ventricular regional wall motion abnormalities. Strain and strain rate imaging have been applied to stress echocardiography as the most recent advancement striving to provide a more quantitative approach.¹ The lumen diameter reduction after percutaneous coronary intervention (PCI) is known as “restenosis”. In the era of bare metal stents (BMS) the occurrence of restenosis ranged between 17–41%. Two strategies should be considered for treatment of any type of coronary in-stent restenosis (ISR): PCI with second or third generation drug eluting stents (DES) and drug coated balloons (DCB).² We will present a case report of successful PCI for in stent restenosis of BMS of mid segment left anterior descending artery (LAD) with third generation DES after verification of ischemia with dobutamine stress echocardiography.

Case report: 75-years-old male patient with hypertension and dyslipidemia, who suffered anteroseptal ST-segment elevation myocardial infarction in January 2017, was treated with PCI of mid segment LAD with implantation of two BMS. One year after procedure he started to complain of mild exercise induced dyspnea. Standard treadmill ECG stress testing was performed up to a maximum predicted heart rate for his age and was without electrocardiographic evidence of cardiac ischemia. In further evaluation of symptoms, in January 2018 dobutamine stress echocardiography was performed, with maximal dose of 40 µg/kg/min. In rest setting, there was no visible regional akinesia of left ventricular wall, but in peak stress, test has clearly shown apicoseptal akinesia to dyskinesia. Both settings were quantitatively analyzed with strain and strain rate methods (Figure 1). After a positive stress echocardiography test, reevaluation with coronary catheterization was indicated due to suspected in stent

FIGURE 1. Curved anatomical M-mode of strain rate analysis in peak stress shows clearly apicoseptal akinesia with marked postsystolic shortening.

RECEIVED:
January 24, 2018
ACCEPTED:
February 10, 2018

restenosis of BMS in mid segment of LAD. Cardiac catheterization was performed on 24th of January 2018 and significant (90%) ISR was determined (**Figure 2**). Using right transradial approach, vessel was cannulated with AL 1.0 6F catheter due to anomalous left coronary artery. Lesion was predilated with NC balloon 2.75x20mm, after which third generation DES 2.75x33mm was implanted (Ultimaster). Procedure was terminated after postdilatation with NC balloon 3.0x15mm, with finally TIMI 3 coronary flow (**Figure 3**).

Conclusion: In reevaluation of post myocardial infarction patients due to occlusive coronary disease in LAD region treated with PCI, stress ECG treadmill testing is not sufficient for analysis of left ventricular ischemia and possible target lesion failure detection. Stress imaging should be applied and stress echo with strain rate analysis can match sensitivity and specificity of single photon emission computed tomography or cardiovascular magnetic resonance imaging stress testing. PCI of ISR with second or third generation DES or DCB are methods of choice for treatment.

FIGURE 2. Coronary angiogram before intervention shows significant in-stent restenosis in the mid segment of the left anterior descending artery.

FIGURE 3. Coronary angiogram after intervention shows no stenosis and TIMI 3 flow in the left anterior descending artery.

LITERATURE

1. Armstrong WF, Ryan T. Feigenbaum's Echocardiography, 7th Edition, Lippincott Williams & Wilkins, 2010.
2. Buccheri D, Piraino D, Andolina G, Cortese B. Understanding and managing in-stent restenosis: a review of clinical data, from pathogenesis to treatment. J Thorac Dis. 2016 Oct;8(10):E1150-E1162. <https://doi.org/10.21037/jtd.2016.10.93>