




# Case report of dobutamine stress echocardiography selecting treatment strategy after acute pulmonary edema in a patient with acute coronary syndrome and severely depressed left ventricular function

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**Introduction:** Assessment of myocardial viability can be done with a variety of imaging techniques, including nuclear, magnetic resonance and echocardiographic methods. Stress echocardiography offers higher specificity for postoperative ejection fraction improvement than perfusion techniques due to the requirement of viable myocardium with preserved contractile reserve.<sup>1,2</sup> Low dose dobutamine is the preferred method for viability assessment. Myocardial revascularization without detected viability may be considered according to guidelines but portends worse prognosis<sup>3</sup> and in this case, if feasible, left ventricular assist devices and heart transplantation may be considered. Dipyridamole in very low doses can be used for viability detection and may be considered due to a better safety profile than dobutamine in patients with uncontrolled hypertension or tachyarrhythmias<sup>4</sup>.

**Case report:** 64-years-old male patient, formerly treated for hypertension, type 2 diabetes mellitus and peripheral vascular disease (conservative therapy) was admitted to coronary care unit due to chest pain with modest troponin elevation. Coronary angiography was urgently performed and revealed highly significant stenoses in proximal parts of all coronary vessels with high syntax score (**Figure 1, Figure 2**). Immediate referral to the cardiac surgeon was suggested by an interventional cardiologist

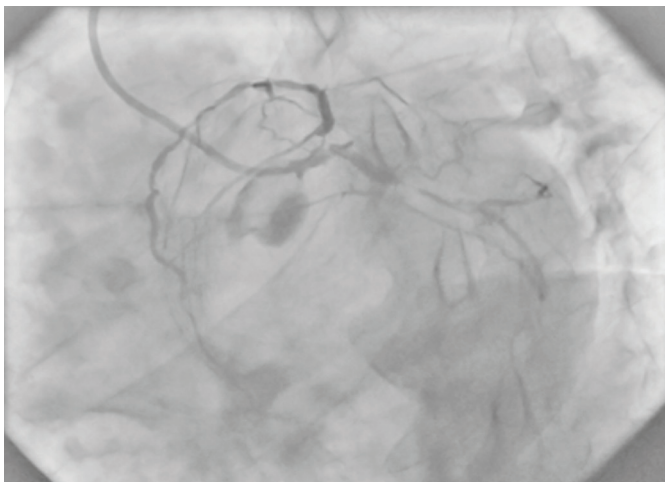


FIGURE 1. Coronary angiography (LAO caudal).

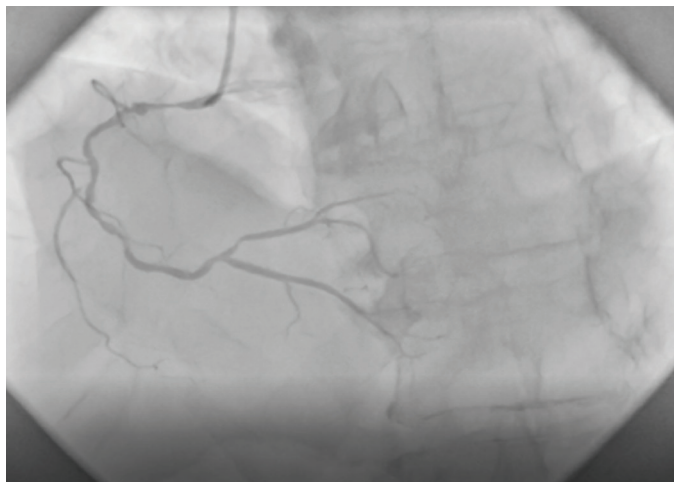


FIGURE 2. Coronary angiography (LAO cranial).

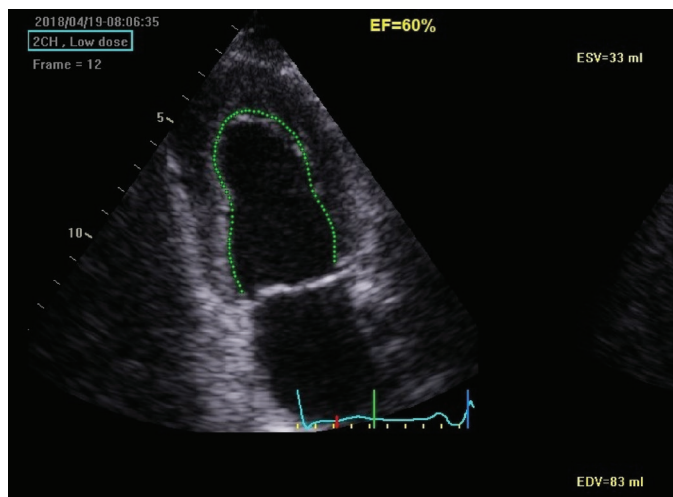
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but upon completion of diagnostic procedure pulmonary edema was induced due to contrast infusion and hypertensive reaction (RR 180/100). Despite urgent treatment with parenteral nitrate, loop diuretics, morphine and non-invasive ventilation significant lactic acidosis with pH 7.1 and acute respiratory failure ensued (SO<sub>2</sub> 72%). Bedside echocardiography showed left ventricular ejection fraction (LVEF) 30% with hypo/akinesia in all vascular territories. Patient was sedated, intubated and mechanically ventilated for a few hours. When he was clinically stabilized heart team opted for viability assessment in order to plan treatment (in case of no viability detected left ventricular assist device as a bridge to heart transplantation would be an option). Serial troponins showed only modest elevation above reference values. We opted for a low dose dobutamine protocol (up to 10 mcg/kg/min) when the patient

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**FIGURE 3.** Left ventricular ejection fraction in 2-chamber apical view after 10 mcg/kg/min dobutamine infusion.

was normotensive and clinically stable and verified LVEF increase to 54% (by Simpson method measuring 2- and 4-chamber with auto LVEF by speckle tracking) (Figure 3). The patient was transferred to cardiac surgery and had received LIMA to LAD and RIMA to PD which was a part of the right dominant coronary artery. Subsequently we documented good functional recovery (stress ECG test 4 months later was stopped after 6 minutes of Bruce protocol due to peripheral claudication with no chest pain or dyspnea and without significant ECG changes). Echocardiography 10 months after revascularization showed LVEF of 55% with normokinesia in all segments of myocardium. MSCT angiography verified bilateral femoral artery occlusion. With walking distance of 500 meters he has not been scheduled for operative/interventional treatment at this point in time and has completed hospital cardiac rehabilitation programme.

**Conclusion:** Different imaging modalities can be used for viability detection in severely depressed left ventricular function. Pharmacological stress imaging has higher specificity for improvement of ejection fraction after revascularization than perfusion-based tests and may be done if the risk is perceived acceptable as it was in our patient after clinical stabilization.

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