

Delayed Presentation of Acute ST Segment Elevation Myocardial Infarction Complicated with Heart Failure in the Period of COVID-19 Pandemic - Case Report

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Abstract

Background: Delayed provision of medical care to patients with acute chest pain who failed to seek medical attention on time due to fear from COVID-19 pandemic is a concern among health care professionals.

Case summary: We report the case of a 47-year-old man with acute chest pain and dyspnea presenting with ST segment elevation myocardial infarction (STEMI). Patient did not seek medical attention on time due to fear from COVID-19 pandemic. Urgent echocardiography detected left ventricular function with ejection fraction (LVEF) of 35%. Percutaneous coronary intervention (PCI) with direct stenting to LAD as culprit lesion with additional stenting of right coronary artery (RCA) was performed. Patient was discharged clinically stable with heart failure.

Discussion: COVID-19 outbreak is associated with significantly lower rate of hospital admissions of patients with STEMI. This worrisome fact might be accompanied by a substantial increase in early and late infarct-related morbidity and mortality. Health care providers and society together must appeal for increased awareness of seeking on-time medical care in case of acute chest pain.

Keywords: STEMI; Complications; COVID-19; Pandemic; Case report

1. Introduction

The COVID-19 outbreak has put severe pressure on healthcare systems worldwide. Even in these hard days we should not forget that cardiovascular diseases are not only the leading causes of mortality worldwide, but also the leading causes for COVID-19 infection related complications [1,2]. There are several potential explanations for significant reduction of acute

coronary syndromes hospital admissions and challenges for near future that cardiologist and health care system will potentially face. We report the case of STEMI patient with heart failure and delayed hospital presentation due to fear from COVID-19 pandemic. Percutaneous coronary intervention (PCI) with direct stenting of LAD and additional stenting of RCA during the same hospitalization led to clinical stabilization of the patient who was discharged with reduced LV function.

2. Case Presentation

A 47-year-old man was admitted to our emergency department due to chest pain and dyspnea. Patient had recurrent episodes of chest pain two days before being admitted to our hospital. He was afraid to call an ambulance or go to the local hospital due to ongoing COVID-19 pandemic. His past medical history included treated hypertension, diabetes type 2 treated with Metformin, hypercholesterolemia and increased body weight (BMI 28,5 kg/m²). The patient is a smoker. Patient's admission blood pressure was 110/65 mmHg and heart rate 122 bpm. The patient was afebrile, dyspnoic with basal lung crepitations. He had negative institutional epidemiologic questionnaire for COVID-19.

Admission ECG showed sinus tachycardia with ST segment elevation in leads V2-V6, DI, DII, DIII, AVF, indicating anterior myocardial infarction (FIG. 1A). The patient was immediately given 300 mg aspirin, 600 mg Clopidogrel, 40 mg Rosuvastatin, 70 IE/kg bolus Heparin (5000 IE), Furosemid iv bolus. Patient Killip Class was II. Patient GRACE Score was 108.

Laboratory analyzes showed serum hs- Troponin-I 6385 ng/mL (normal range 0-15.6 ng/ml ABBOTT essay), Creatinine 94 nmol/l, Glomerular filtration rate (GFR) assessed by Cockcroft-Gault Equation was 108 mL/min/1.73 m², Glucose 14.6 mmol/l, N-terminal proBNP 6097 pg/ml (Abbot Diagnostics). Bed site transthoracic echocardiography (TTE) revealed akinesia of the apex, anterior wall, mid and apical septal wall. Global left ventricular function was severely reduced with LVEF 35% (FIG. 2).

Coronary angiography performed via right radial access revealed distal occlusion of left circumflex artery (LCx), with TIMI flow 0- chronic total occlusion (CTO), proximal 95% stenosis of right coronary artery (RCA) with TIMI flow 3, 1st Obtuse Marginal artery stenosis of 100% with TIMI flow 0 - CTO. Culprit lesion was mid left anterior descending artery (LAD) stenosis of 99% with TIMI flow 0. Direct stenting of the mid LAD lesion with drug eluting stent (DES) Orsiro Biotronic was performed with received TIMI flow 2 after stenting. Second stent was put on the additional distal LAD 100% stenosis with TIMI flow 0 (DES stent Orsiro Biotronic) with TIMI flow 2 obtained after intervention. Assessed SYNTAX score was 32. (FIG. 3 A and B). After the procedure, angina was relieved, and there was ST-segment elevation resolution >50% at 60 min (FIG. 1B). Additional stage procedure with PCI and stenting to proximal RCA 95% stenosis with TIMI flow 3 (DES Resolute Integrity stent) was performed on the third day of hospitalization (FIG. 3 C and D).

Patient was discharged on the seventh day of hospitalization, clinically stable in NYHA Class II. The following discharge therapy was the prescribed: Acetylsalicylic acid 100 mg OAD, Clopidogrel 75 mg OAD, Rosuvastatin 40 mg OAD, Spironolactone 25 mg OAD, Furosemide 40 mg OAD, Ramipril 5 mg OAD, Bisoprolol 2.5 mg OAD, Metformin 1000 mg BID, Pantoprazole 40 mg OAD. He was advised to immediately seek medical assistance in case of new chest pain. Control echocardiography was scheduled for 6 weeks in order to assess the need of primary prevention ICD implantation.

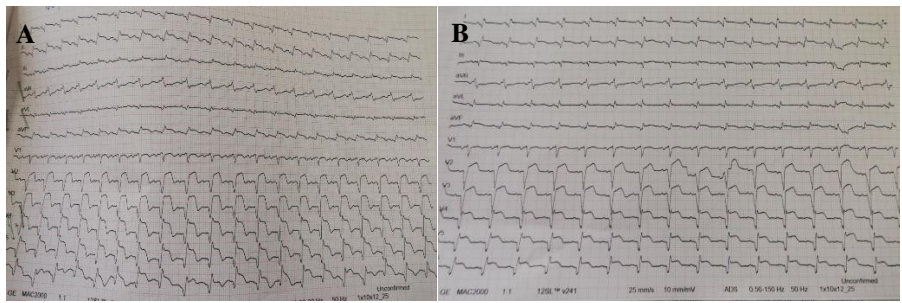


FIG. 1. (A) Admission ECG with ST segment elevation in leads V1-V6, DII, DIII, AVF, with QS form in the same leads consistent with acute anterior ST segment elevation myocardial infarction. (B) ECG 90 minutes after the PCI of LAD with >50% reduction of ST segment elevation in leads V1-V6, DII, DIII, AVF, one of the markers of reperfusion success.



FIG. 2. Bedside echocardiography showing increased left ventricular cavities and volumes with reduced left ventricular function.

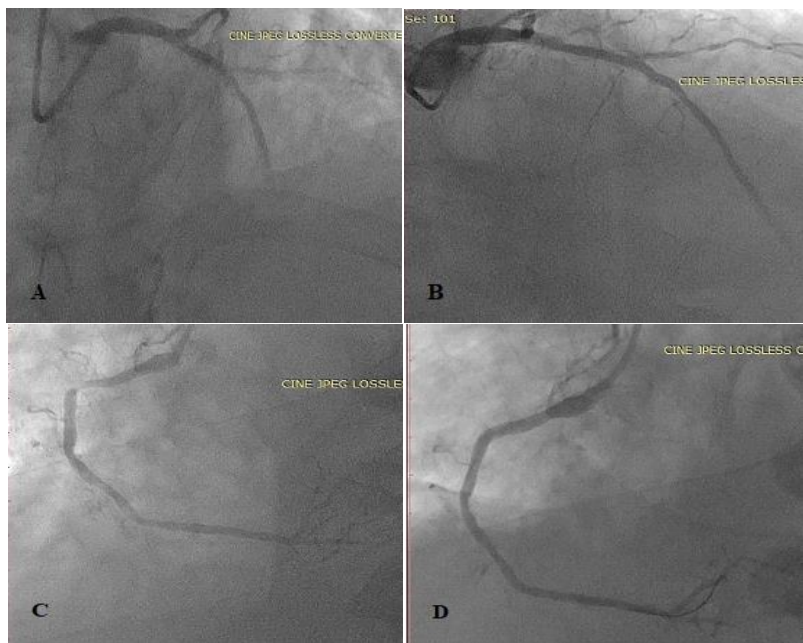


FIG. 3. (A) Significant stenosis of proximal left anterior descending coronary artery. (B) Final result after stenting of the proximal left anterior descending coronary artery. (C) Significant stenosis of the proximal right coronary. (D) Final result after stenting of the proximal left anterior descending coronary artery.

3. Discussion

This case presents an example of STEMI patient with heart failure as a consequence of failure to seek on time medical attention in the period of COVID-19 pandemic. Our patient is relatively young with several important comorbidities such as diabetes type 2, hypertension and obesity. His fear from COVID-19 pandemic, resulted in his delayed seeking of medical help. Recent data suggest significant increase in mortality during this period that cannot be fully explained by Covid-19 cases alone [3]. Several European and US retrospective observational studies are reporting on unexpected major decline in hospital admissions for all subtypes of ACS with the beginning of the COVID-19 outbreak [4,5] Compared to the same period last year, our clinic as the biggest country cardiovascular and PCI center has faced decrease of ACS patients of approximately 60%, similarly to the percent reported in many world hospitals. One of the explanations is patient's fear of COVID-19 infection and symptoms masking, that prevents patients from seeking medical care.

The rigorous public health measures during COVID-19 pandemic, has affected regular function of health care systems. Importantly, diabetic patient with ACS often present with dyspnea, atypical or absent chest pain and nonspecific ECG changes, which might be understood as respiratory infection and lead to delay in diagnosis and treatment. The lower rate of admitted and treated ACS patients might be followed by a significant increase in infarct-related morbidity and mortality. Additional explanations point to the influence of reduced pollution levels, physical inactivity and smoking reduction. Some studies have suggested that maybe people are dying at home [6]. The possibility also exists that, in a state of overwhelmed hospitals, patients are not examined by cardiologist or referred for diagnostic tests, as they would normally be.

Treatment of ACS should follow current European Society of Cardiology (ESC) guidelines for ST-elevation myocardial infarction (STEMI) and non-ST-elevation acute coronary syndromes (NSTEMI) [7,8]. Patients who do not get successful reperfusion are at higher risk of early complications and death. Treatment of heart failure in COVID pandemic should follow latest recommended heart failure treatment scientific guidelines. Despite many controversies, scientific positions of the relevant cardiology societies indicate we should continue to use of ACE inhibitors and Angiotensin receptor blockers (ARBs) in patients with heart failure, in the absence of conventional contraindications for their use [9,10].

In the time of COVID-19 pandemic all STEMI patients should be assessed and treated as potentially positive for the infection until otherwise results received. We can expect to face increased presentation of patients with STEMI complications, heart failure, arrhythmias and mechanical complications during and after the COVID-19 outbreak.

4. Conclusions

We report a case of STEMI patient who present with heart failure due to delayed medical care seek caused by fear from COVID-19 pandemic. Percutaneous coronary intervention (PCI) lead to clinical stabilization of the patient. The COVID-19 pandemic should not reduce timely reperfusion of STEMI patients. The case is highlighting the urgent need of increased awareness of prompt recognition and fast medical care provision to all individuals with acute chest pain during the COVID-19 pandemic.

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