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CASE REPORT

Acute Thrombosis of the Left Main on the Tennis Court in a Young Patient – a Case Report

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ABSTRACT

In acute coronary syndromes, timely revascularization of the obstructed artery is crucial. In young patients, acute myocardial infarction can have a very severe evolution and is frequently associated with cardiogenic shock. We present the case of a 36-year-old male patient, smoker with no other apparent risk factors for coronary artery disease, who suffered a cardiac arrest while playing tennis. Emergency coronary angiography revealed acute occlusion of the left anterior descendent artery, which was promptly revascularized. The patient had a good clinical evolution and was discharged after six days. The case underlines the importance of a well-functioning emergency system and STEMI network, able to provide life-saving therapy in a timely manner.

Keywords: left main coronary artery thrombosis, young patients, primary PCI

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INTRODUCTION

Acute coronary syndromes are major medical emergencies in which timely revascularization of the obstructed artery is crucial in order to save the viability of the myocardial fibers. The leading cause of death in patients hospitalized for acute myocardial infarction (AMI) is cardiogenic shock (CS).[1] Many studies indicate a significant survival benefit at six months after early revascularization. Especially for patients with AMI complicated by CS, primary percutaneous coronary intervention (PCI) should be strongly considered and may be life-saving.[2–4]

In very young patients, AMI carries a significant morbidity, being associated with a strong psychological impact and financial burden for the patient and their family.[5] At the same time, in young patients suffering an AMI, CS is frequently associated, requiring a rapid diagnosis and supportive therapy.[1] Despite significant advances in device-based and pharmacological therapies for CS, the mortality associated with this critical condition has not improved significantly over the past 20 years.[5–7] However, an efficient management, consisting in early stabilization and immediate repermeabilization (with fibrinolytic therapy or percutaneous intervention), has been shown to reduce the mortality associated with this severe condition.[8]

At the same time, left main coronary artery thrombosis (LMCAT), identified during coronary angiography, is a rare and challenging condition.[7–9] Left ventricular dysfunction (LVD) is the most common cause of CS, being reported as the primary cause of CS in 74.5% of patients with acute heart failure.[2,10]

In young patients aged <35 years, AMI is poorly characterized, although it is estimated to be less than 2%. Fur-

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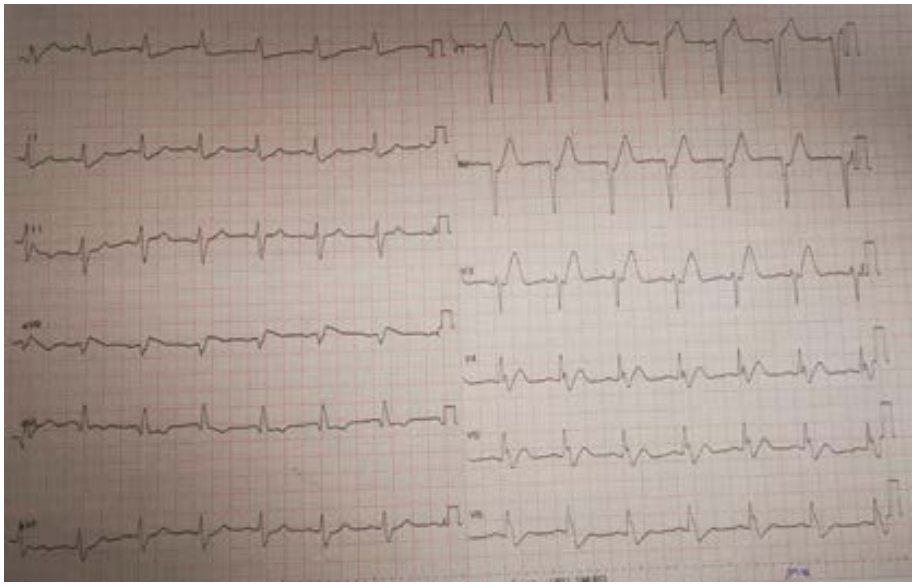

FIGURE 1. ECG of the patient which revealed ST-elevation in anterolateral leads with mirror-image in posteroinferior leads

thermore, its occurrence at a young age affects the productive age group, with a strong socioeconomic impact.[11]

CASE PRESENTATION

We aim to present the successful treatment of a 36-year-old male patient, smoker, without any history of cardiovascular disease, who had a cardiac arrest while playing tennis. The patient had no significant personal medical history, took no medications, and exercised regularly with no difficulties. Also, family history was not notable for sudden cardiac death or coronary artery disease.

He collapsed on the tennis field in front of his friend and teammate before complaining of developing severe chest pain without any other symptoms. His friend immediately contacted emergency medical services and initiated basic cardiopulmonary resuscitation. The ambulance arrived in 10 minutes, and the patient was transported to the nearest emergency department. Upon arrival, the patient was in ventricular fibrillation, which returned to sinus rhythm after one electric shock of 200 J. He was resuscitated for 20 minutes in total. On presentation at the emergency room, the patient's blood pressure was 90/60 mmHg, heart rate was 101 beats/min, and oxygen saturation was above 97% on oxygen mask. Positive inotropic and vasopressor agents, dobutamine and noradrenaline, were initiated as treatment for hemodynamic instability.

The twelve-lead electrocardiogram (Figure 1) revealed ST segment elevation in antero-lateral leads, which led to the diagnosis of ST-elevation acute coronary syndrome. Based on the electrocardiogram, elevated cytolytic myocardial enzymes, and primary symptoms, the patient was diagnosed with Killip IV anterior ST-elevated myocardial infarction (STEMI).

The bedside cardiac echocardiography revealed a left ventricular failure with global akinesia, ruling out any aortic aneurysm or dissection.

Afterwards, the patient was transferred for emergency cardiac catheterization, where he developed cardiogenic pulmonary edema which was successfully treated. The coronary angiography was performed using a right transradial approach and revealed an acute thrombosis in the left main, treated with thrombectomy followed by stent implantation in the left main and in the circumflex artery. The revascularization procedure was done at one hour from the onset of cardiac arrest.

The patient was further transferred to the acute cardiac care unit, where he was continuously monitored and stabilized. Immediately after the intervention, the echocardiography revealed severe left ventricular dysfunction with left ventricular ejection fraction (LVEF) of only 25%, akinesia of the apex and severe septal and anterior wall hypokinesia. NT pro-BNP levels was 352 pg/mL. Complex treatment for coronary ischemic disease, heart failure, and arrhythmia was initiated during hospitalization, and no further complications were registered during the acute phase. Before hospital discharge, the patient was instructed to achieve an ideal weight and was counseled for smoke cessation and a diet low in saturated fat and cholesterol.

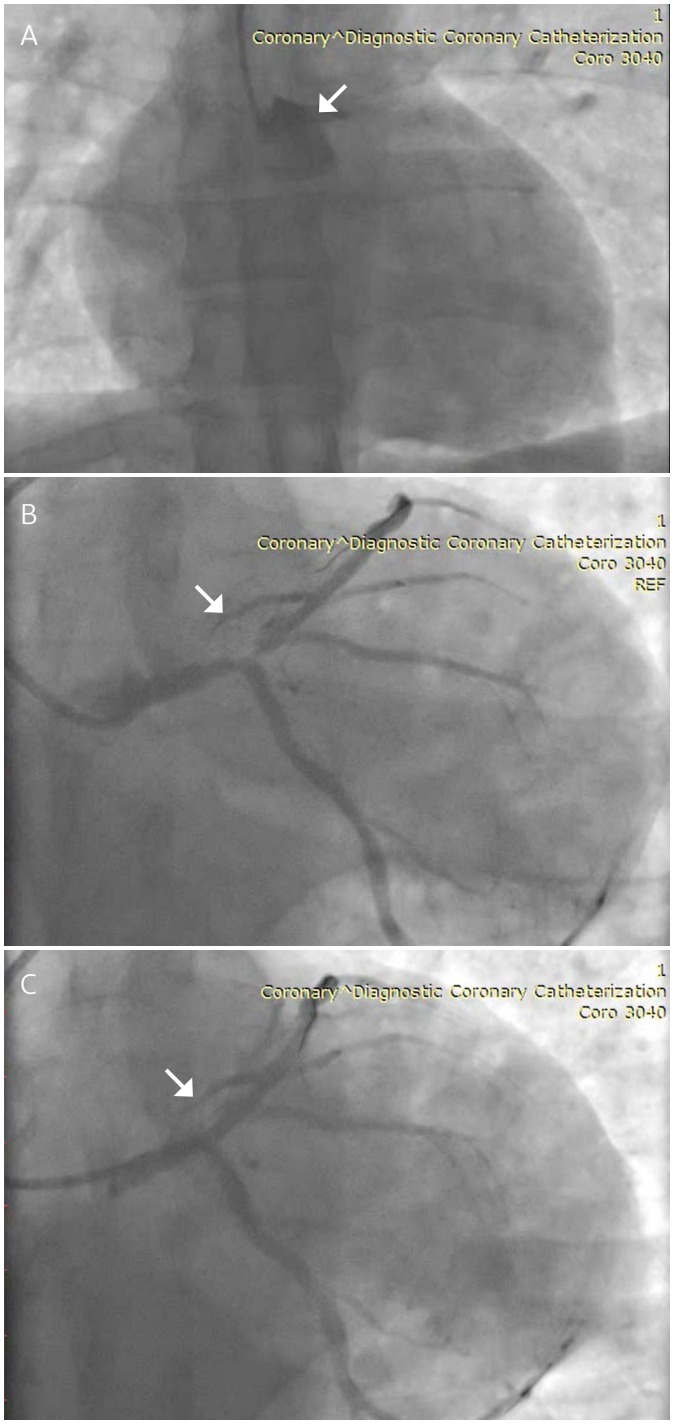

FIGURE 2. Coronary angiography. **A** – LMCAT (arrow); **B** – post-interventional aspect, with residual stenosis (arrow); **C** – post-interventional aspect with no residual stenosis (arrow)

The echocardiography performed at the one-month follow-up revealed a LVEF of 40% with septal and anterior wall hypokinesia. At six months after discharge, the patient was completely asymptomatic, the echocardiography revealed a LVEF of 52% and an NT pro-BNP level of 118 pg/mL.

The patient agreed to the publication of his data and the publication was approved by the institution ethics committee.

DISCUSSION

The particularities of STEMI management in very young patients are not well defined. These patients usually have a poor collateral coronary network, which severely limits the possibility to provide alternative irrigation in case of sudden coronary artery occlusion. Another particular aspect of MI occurring in very young patients is the absence of prodromal symptoms, fact which seems to be more common in younger patients with coronary artery disease.[4–6] Consistent with the published data, mortality due to cardiogenic shock in AMI has been found to be significantly lower in hospitals with catheterization laboratory than in hospitals without such facilities.[7,9] The outcome of PCI is important in determining the survival of patients, and the degree of reperfusion in the infarct-related artery is associated with outcomes.[3]

In the recent SHOCK trial, the 30-day mortality rate was reduced with successful angioplasty (38%) as compared to patients with unsuccessful angioplasty (79%). However, reperfusion was lower in patients with CS.

Patients with CS have less successful reperfusion rates with PCI in the infarct-related artery compared to patients without shock (54% to 100%). LMCAT is a rare and life-threatening angiographic finding, with an estimated incidence of 0.8–1.7% among patients with STEMI and a dramatic clinical presentation with cardiogenic shock or sudden cardiac death. The usual pathophysiological substrate of LMCAT is fibrous cup rupture of an atherosclerotic plaque, followed by thrombus formation. However, other predisposing factors include hypercoagulable state, post-partum state, embolization of intracardiac masses, cocaine-induced plaque rupture, and vasospasm.

There are two strategies in treating AMI-related CS: medical and invasive. In institutions lacking revascularization facilities, fibrinolytic therapy may represent an alternative. Complete thrombosis of the left main coronary artery is a rare angiographic finding and usually leads to CS. The prognosis of this condition is very dependent on the collateral coronary circulation and the myocardial protection seems to depend on the rapidity of revascularization. Two therapeutic approaches may be envisaged; emergency coronary bypass grafting or percutaneous angioplasty, the natural history being particularly disastrous. However, current guidelines favor an invasive approach. Prognosis is established by the outcome of re-

vascularization regardless of the procedure used, such as PCI or surgery.

CONCLUSION

This case indicates the importance of early diagnosis and revascularization in STEMI, especially in the case of STEMI occurring at a very young age. The patient was lucky to have the cardiac arrest on a tennis field that was close enough to the cathlab, and to have resuscitation started immediately after the onset of the CS. This presentation should draw attention to the importance of going to the closest hospital immediately after the onset of symptoms.

CONFLICT OF INTEREST

Nothing to declare.

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