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Antithrombotic therapy management in a man with ST elevation myocardial infarction and triple positive antiphospholipid syndrome: case report and literature review

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Abstract. – OBJECTIVE: Antiphospholipid syndrome (APS) is a systemic autoimmune disorder associated with vascular complications including acute myocardial infarction (AMI). AMI pathogenesis in APS is considered to be acute thrombosis of coronary arteries, in contrast to typical AMI where the pathogenesis is atherosclerotic plaque rupture. Therapeutic management is therefore a clinical challenge. There is no consensus among experts about optimal antithrombotic therapy in secondary prevention. The role of coronary stents is still to be determined, due to the higher rates of stent thrombosis after percutaneous coronary intervention (PCI) in APS patients.

CASE REPORT: We described the case of a 51-year-old male, smoker, that presented with anterior ST elevation myocardial infarction (STEMI) as first manifestation of APS. The patient underwent primary PCI on left main and ostial left anterior descending artery.

RESULTS: We discussed antithrombotic therapy management after PCI in our patient and reviewed literature on current therapeutic management of this specific population.

CONCLUSIONS: APS patients with STEMI should undergo PCI, usually associated with thrombus aspiration, and in select cases stent implantation in the culprit lesion. In the latter case, triple antithrombotic therapy with short-term dual antiplatelet therapy and long-term anticoagulant therapy is recommended. Clinicians should include autoimmune etiologies in the differential diagnosis of underlying causes of AMI.

Key Words:
Antiphospholipid syndrome, Acute coronary syndrome, ST-elevation myocardial infarction, Antithrombotic therapy.

Introduction

Antiphospholipid antibody syndrome (APS) is a systemic autoimmune disorder characterized by venous and arterial thromboembolic disease (including AMI) and/or pregnancy morbidity, associated with persistent elevated serum levels of antiphospholipid antibodies (aPL)[1]. aPL are represented by lupus anticoagulant (LA), anticardiolipin (aCL) and anti-beta2-glycoprotein I antibodies (anti-β2GPI).

Case Report

A 51-year-old man presented to our Emergency Department with typical chest pain, which started two days earlier and worsened since onset. The patient was a smoker, with a 20 pack years history of smoking. He denied the existence of any additional cardiovascular risk factors and had no significant past medical history. The patient's family history did not include any significant disease. On arrival, his vitals were within normal limits. Electrocardiogram (EKG) showed sinus rhythm with Q waves and ST elevation in the anterior leads. Laboratory tests documented increased troponin levels. A diagnosis of anterior ST elevation myocardial infarction (STEMI) was made, and the patient was promptly taken into our catheterization laboratory. Coronary catheterization showed a high burden thrombotic plaque determining subocclusion of the left main coronary artery (LM) and ostial left anterior descending artery (LAD) (Figure 1). Primary percutaneous coronary angioplasty (PCI) with a Zotarolimus-eluting stent implantation (Figure 2) was performed, with good angiographic results (Figure 3). Multiple attempts of PCI were made for a distal LAD occlusion, but it failed, and intracoronary Eptifibatide was administered (Figure 4). The patient was admitted to our cardiac intensive care unit (CICU) and a dual antiplatelet

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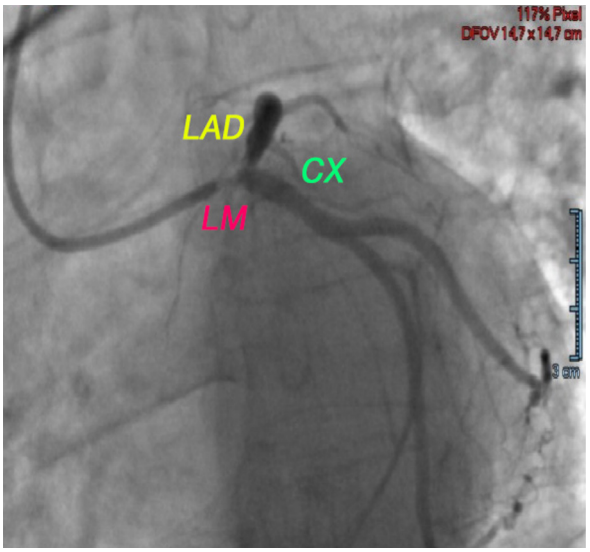

Figure 1. Coronary angiogram documenting atherosclerotic plaque with subocclusion of the left main coronary artery and ostial left anterior descending artery.

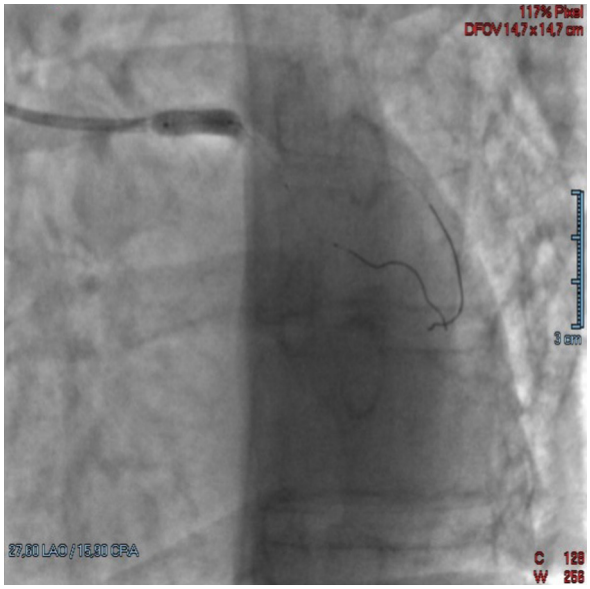

Figure 2. Primary percutaneous coronary angioplasty with implantation of a Zotarolimus-eluting stent on left main coronary artery and ostial left anterior descending artery.

therapy (DAPT) with cardioaspirin and ticagrelor was started. The echocardiogram showed a left ventricular ejection fraction (LVEF) of 40% with apical akinesis, septal and anterior wall hypokinesis and no significant valves disease. In CICU a serum activated partial thromboplastin time (aPTT) abnormal value (100.5 sec; normal range 25-38.5 sec) was detected. aPTT mixing study did not correct the aPTT. Given suspected autoimmune prothrombotic state, normal hemoglobin and platelets values and low bleeding risk, low molecular weight heparin (LMWH) 100 IU/kg every 12 hours was started. DAPT therapy

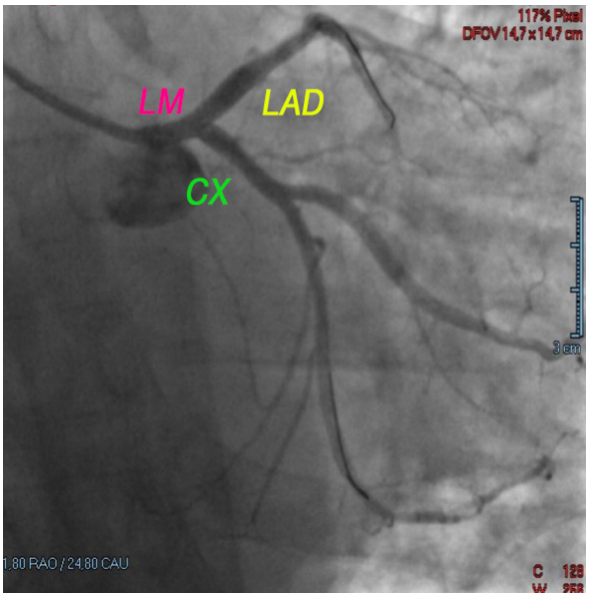

Figure 3. Good angiographic result after percutaneous coronary angioplasty on left main and ostial left anterior descending arteries.

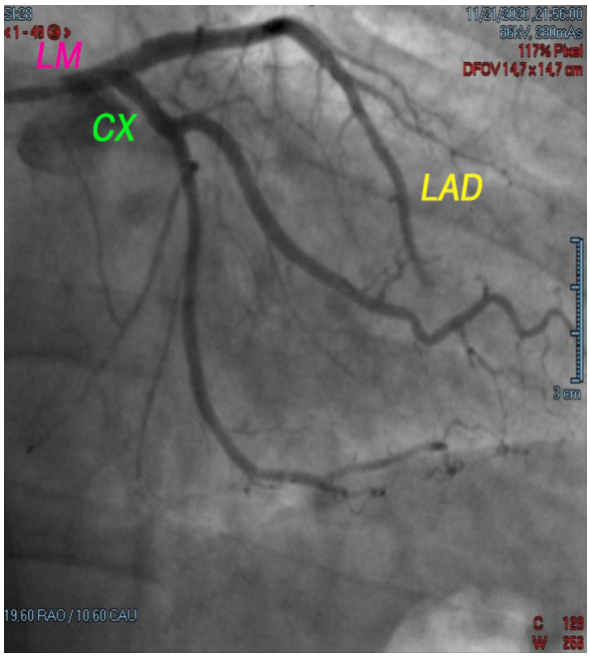

Figure 4. Persistence of distal left anterior descending artery occlusion despite multiple attempts of percutaneous coronary angioplasty.

was modified switching from ticagrelor to clopidogrel. LA, aCL IgG and anti-β2GPI IgG blood tests resulted positive, while other rheumatologic tests were negative. A diagnosis of primary APS was therefore confirmed. Echocardiogram before discharge showed an improved LVEF (50%). The patient was discharged in good and stable hemodynamic conditions, in "triple therapy" (DAPT plus LMWH). He was referred to the rheumatology outpatient clinic for rheumatologic follow-up appointments. The patient repeated LA, aCL and anti-β2GPI blood tests 12 weeks later, that confirmed a triple positive APS. These findings satisfied the revised Sapporo criteria for the diagnosis of APS2. The rheumatologist switched the patient's therapy to clopidogrel and warfarin. At the 3-month follow-up cardiology visit, the patient, now former smoker, was asymptomatic for chest pain, dyspnea and syncope. Blood pressure and routine blood tests were within normal limits. Repeat echocardiogram confirmed a LVEF of 50%. The patient was recommended to continue with his medical therapy and to attend regular cardiologic and rheumatologic follow-up appointments.

Discussion

APS is a systemic autoimmune disorder associated with vascular complications, including AMI. APS is rarely associated with AMI (~5.5%) and in only 2.8% of patients AMI represents the first manifestation of the disease. Interestingly, aPL were found in 11% of patients with AMI not diagnosed with APS previously[1].

AMI pathogenesis in APS is considered to be acute thrombosis of coronary arteries, in contrast to typical AMI where the pathogenesis is atherosclerotic plaque rupture. Key factors in identifying APS as potential underlying cause of AMI include young age, previous unprovoked thromboses, low platelets count, high aPTT values and coronary artery thromboses in the setting of otherwise normal appearing coronary arteries[3]. In APS, low platelets values may be reported since platelets are consumed in the thrombotic process, in contrast with typical atherosclerotic AMI, which can lead to a reactive thrombocytosis. aPTT prolongation in patients with APS and LA positivity may be due to an interference with assembly of the prothrombinase complex on phospholipids. APS antibodies have also pro-inflammatory activity on vascular endothelial cells, leading to accelerated atherosclerosis.

Adjusted Global Antiphospholipid Syndrome Score (aGAPSS) is useful for risk stratification of recurrent thrombosis and AMI in young patients with APS. aGAPSS incorporates independent cardiovascular risk factors and autoimmune antibody profile[4].

The treatment of AMI in APS is therefore a clinical challenge. Strict management of additional cardiovascular risk factors is crucial. Anticoagulation with vitamin K antagonists (VKA) should be administered for life, due to the very high risk of recurrent thrombotic events. Warfarin at an INR >3.0 or low-dose aspirin plus standard-intensity warfarin (INR 2 to 3) are the current recommendation, although some experts believe that antiplatelet therapy alone or warfarin with INR range 2.0-3.0 are equivalent[5]. Direct oral anticoagulants are less effective and less safe than VKAs for thromboembolism prevention in long-term follow-up of real-life APS patients[6]. The role of coronary stents, considering the higher rates of stent thrombosis after PCI in APS patients and the concomitant risks of triple therapy, require further studies.

Conclusions

Due to the lack of large, randomized, prospective studies, there is no consensus among experts about optimal antithrombotic therapy in secondary prevention after an arterial thromboembolic event. APS patients with STEMI should undergo PCI, usually associated with thrombus aspiration, and in select cases stent implantation in the culprit lesion. In the event of stent implantation, triple antithrombotic therapy with short-term DAPT and long-term anticoagulant therapy is recommended[5]. aGAPSS may be a helpful tool for antithrombotic treatment management in APS patients (cutoff value for high risk ≥10).

Clinicians should include autoimmune etiologies in the differential diagnosis of underlying causes of AMI.

Conflict of Interest

The Authors declare that they have no conflict of interests.

Informed Consent

Informed consent was obtained from the participant included in the study.

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