中文題目：一個與抗磷脂質症候群相關之左主幹動脈心臟梗塞案例

英文題目：Acute Myocardial Infarction Involving Left Main Artery in a Patient with Antiphospholipid Syndrome

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Introduction

Antiphospholipid syndrome (APS) is an autoimmune disease characterized by vascular thromboses (arterial, venous, or small vessels) and elevated serum levels of antiphospholipid antibodies (anticardiolipin, lupus anticoagulant, or anti-β2 glycoprotein I).[1] The most common manifestation of APS is deep vein thrombosis (31.7%). Acute myocardial infarction (AMI) is a rare manifestation of APS with an overall prevalence of 5.5%, but has a relative good in-hospital prognosis (92.5% survival rate).[2,3] However, this rare manifestation can lead to a lethal outcome. Here, we presented a young female with AMI and cardiogenic shock due to APS.

Case

A 39-year-old woman, a non-smoker, presented to our emergency department with severe retrosternal chest pain and cold sweating for two hours. She had no previous history of hypertension, diabetes mellitus, hyperlipidemia, or pregnancy, but her mother was diagnosed with systemic lupus erythematosus. At our emergency department, her 12-lead electrocardiogram revealed accelerated junctional or ventricular rhythm, new onset right bundle branch block, ST elevation at lead I and aVL, as well as ST depression at lead II, III, and aVF (Fig. 1).[4] Computed tomography excluded the likelihood of aortic dissection, pneumothorax, or pulmonary embolism. Before coronary angiography for highly suspicious AMI, she experienced hemodynamic shock with pulseless electrical activity. She received cardio-pulmonary-cerebral-resuscitation and returned spontaneous circulation in seven minutes. Because of persistent hemodynamic shock, cardiac surgeon set up extra-corporeal membrane oxygenation (ECMO). Meanwhile, her laboratory examination showed elevated troponin I of 0.46 ng/ml, elevated total creatine kinase of 467 U/l, and elevated CK-MB

isoenzyme of 38.3 U/l. Besides, she received a loading dose of aspirin 300mg and ticagrelor 180mg, along with intravenous heparinization.

After stabilized, she received coronary angiography, showing a large thrombus in the left main artery with patent right coronary artery (Fig. 2). She received percutaneous coronary intervention (PCI) with a drug eluting stent replacement, supported by intra-aortic balloon pumping and ECMO. Then she was admitted to our intensive care unit and received therapeutic hypothermia. She received standard AMI management with aspirin 100mg per day, ticagrelor 90mg twice per day, intravenous heparinization, and inotropic agents of dobutamine and norepinephrine.

During her hospitalization, we confirmed that she had no conventional cardiovascular risk factors, including diabetes mellitus and hyperlipidemia. Because her mother had a known autoimmune disease, we checked her profiles of autoimmune disease. Her autoimmune profiles revealed borderline positive speckled and homogeneous antinuclear antibody of 40 times, along with low level of C3 and C4, positive antiphospholipid immunoglobulin G, anticardiolipin immunoglobulin G of more than 160 U/ml, anti-β2 glycoprotein immunoglobulin G of more than 160 U/ml, and positive lupus anticoagulant (LA) (LA 1 is higher than 100 seconds, LA 2 is 41.6 seconds, and ratio of LA1/LA2 is 2.48). Besides, she had negative results of anti-DNA antibody, anti-ENA antibody, anti-SmD antibody, anti-RNP antibody, rheumatoid factor, perinuclear neutrophil antibodies, anti-Ro antibody, and anti-La antibody. Therefore, primary APS was highly suspected based on the revised Sapporo APS Classification Criteria, though we couldn't repeat antibody profile after 12 weeks.

Despite aggressive medical treatment, she developed refractory cardiogenic shock with multiple organ failure. Transthoracic echocardiography revealed severe global hypokinesis with an ejection fraction of 11%. Although we planned to arrange heart transplantation for the patient, she expired on the sixth day after her hospitalization

Discussion

AMI due to APS is rare with an overall prevalence of 5.5% and is even rare as an initial manifestation with a prevalence of 2.8%.[2] The average age of AMI associated with APS is 41.1 years,[3] significantly lower than patients with typical AMI (64.7 years).[6] While women constitute 29.9 % of AMI cases in general population,[6] women occupy 45% of AMI associated with APS.[3] APS is more common in women than man,[2] so it is reasonable to consider APS in a young woman without conventional cardiovascular risk factors. One systemic review of 40 AMI cases due to APS reported that, in its supplementary file, ST-elevation myocardial infarction (STEMI) was the most common presentation of 45%, non-STEMI occupied 27.5%, and 27.5% were not specified with AMI types. Among these 28 cases of STEMI and NSTEMI, 75% were either thrombotic or patent coronary artery, while 25% had obstructive atherosclerotic stenosis, including six cases of left anterior descending artery, three cases of right coronary artery, and two cases of left circumflex artery.[3] No cases involved left main artery. The overall in-hospital prognosis is good, with a 92.5% survival rate.[3] Thus, our case had a large thrombus in left main artery with a catastrophic outcome, a rare presentation of AMI related to APS.

The treatment of AMI due to coronary artery disease focuses on coronary reperfusion, dual-antiplatelet agents, and anti-thrombotic therapy.[7,8] After PCI, life-long anticoagulation is usually not recommended. However, mechanism of coronary stenosis or occlusion in APS is mostly thrombotic. Because treatment of APS with thrombotic events is life-long anticoagulation from initial presentation, AMI associated with APS should consider life-long anticoagulation.[5] Besides, intensity of anticoagulation is under debate. Some experts recommend conventional intensity of anticoagulation with warfarin at an international normalized ratio (INR) of 2.0 to 3.0 for APS with the first venous event, whereas APS with arterial thrombosis or recurrent venous events should be treated with warfarin at an INR 3.0 or greater. A systematic review of observational studies concluded that the rate of recurrent arterial thrombosis was significantly lower with INR more than 3.0.[9] Published data on direct oral anticoagulants (DOACs) for APS are limited. One randomized controlled trial comparing rivaroxaban with warfarin (target INR of 2.0 to 3.0) for secondary

prevention of venous thromboembolism associated with APS showed that no patient in either group had bleeding or thrombosis during a six-month period.[10] Further trials are needed to confirm efficacy and safety of DOACs for APS. In our case, dual anti-platelets therapy (DAPT) and intravenous heparinization were given before and after PCI, and when the patient was supported by ECMO. There is insufficient evidence to determine whether patients with APS after PCI should give triple anti-thrombotic therapy (DAPT, plus anti-coagulation) or dual therapy (clopidogrel plus anti-coagulation). Further APS trials for dual or triple anti-thrombotic therapy are needed.

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Figure Legends

Figure 1. The 12-lead electrocardiogram shows accelerated junctional or ventricular rhythm, new onset right bundle branch block, ST elevation at lead I, aVL and ST depression at lead II, III, aVF.

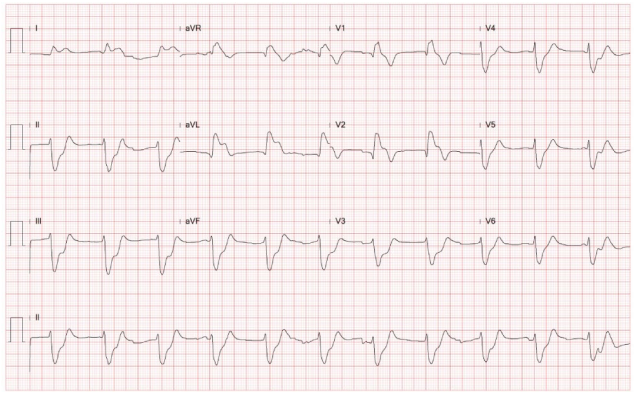

Figure 2. The coronary angiogram right anterior oblique (RAO) view shows proximal occlusion of left main artery with a large thrombus (arrow)