Antiphospholipid syndrome combined with acute coronary syndrome

Case report

Yuan Shan, MD, Ping Wang, MD*, JingHua Liu, MD*

Abstract
Rationale: Antiphospholipid syndrome (APS) combined with acute coronary syndrome (ACS) is rarely reported.

Patient concerns: One male patient with APS was admitted to our hospital, who had recent unstable angina (UA).

Diagnosis: The preliminary diagnosis of ACS and UA (BraunwaldIIB) was then made.

Interventions: This patient received secondary preventative therapy for coronary heart disease (CHD) in combination with percutaneous transluminal coronary angioplasty (PTCA) and implantation of NeoVas Biodegradable Coronary Scaffold.

Outcomes: The patient was followed up, without new UA episodes were observed at 6 months, 1 year, and 2 years after surgery, respectively.

Lessons: It was thus concluded that percutaneous coronary intervention (PCI) is effective for APS patients and NeoVas scaffold implantation is presumed safe.

Abbreviations: ACS = acute coronary syndrome, APS = antiphospholipid syndrome, CHD = coronary heart disease, CTA = computed tomography angiography, LCX = left circumflex artery, PCI = percutaneous coronary intervention, PTCA = percutaneous transluminal coronary angioplasty, UA = unstable angina.

Keywords: acute coronary syndrome, antiphospholipid syndrome, bioresorbable scaffold, coronary angiography, unstable angina.

1. Introduction

Antiphospholipid syndrome (APS) is an autoimmune disease, with antiphospholipid antibody (APL) and usually presents recurrent arterial and venous thrombosis, spontaneous abortion, thrombocytopenia, and positive serum APL.[1] Besides thrombosis and pathological pregnancy, APS can also induce severe cardiovascular diseases. Acute coronary syndrome (ACS) refers to a group of symptoms caused by rupture or invasion of coronary atherosclerotic plaques with secondary partially or completely occlusive thrombi. ACS consists of acute ST-segment elevation myocardial infarction, acute non-ST-segment elevation myocardial infarction, and unstable angina (UA). Recent studies have demonstrated a correlation between APS and ACS. For example, Djokovic et al[2] reported cardiovascular diseases in 101 out of 374 patients with APS, including 36 patients with UA. Several cases who received percutaneous coronary intervention (PCI) for APS combined with acute myocardial infarction have been reported.1-3 In this study, we reported a Chinese case of APS combined with ACS.

2. Case presentation

The 70-year-old male patient was admitted to hospital on January 25th, 2016 due to chest pain for 20 days. This patient had dull pain behind the sternum and backache. The symptoms were relieved spontaneously after 2 to 3 minutes and did not affect daily activities and sleep. Chest pain recurred in the morning 5 days ago, and the patient received creatine kinase isoenzyme (CK-MB) test and electrocardiogram at the outpatient clinic 3 days ago and the results were normal. However, computed tomography angiography (CTA) indicated 90% stenosis of the proximal right coronary artery. The patient was prescribed with aspirin, Clopidogrel, pitavastatin, and admitted to hospital for further examinations. This patient had a history of type 2 diabetes for over 20 years and had blood glucose properly controlled through insulin injection. He had a history of hypertension for 10 years with the maximum blood pressure of 150/90mmHg. He generally achieved a proper blood pressure control. Other personal medical histories included diagnoses of immune thrombocytopenic purpura for 8 months and APS for 7 months as well as being a hepatitis B virus carrier for over 20 years. The patient had a history of allergy to sulfonamides without history of smoking and alcohol consumption.

*Correspondence: Ping Wang, Department of Cardiology, Beijing Anzhen Hospital, No. 2, Anzhen Road, Chaoyang District, Beijing 100029, China (e-mail: wang_ping18vip.sina.com); JingHua Liu, Department of Cardiology, Beijing Anzhen Hospital, No. 2, Anzhen Road, Chaoyang District, Beijing 100029, China (e-mail: liujinghua@vip.sina.com).

Copyright © 2018 the Author(s). Published by Wolters Kluwer Health, Inc.
This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Medicine (2018) 97(51):e13613
Received: 20 August 2018 / Accepted: 19 November 2018
http://dx.doi.org/10.1097/MD.0000000000013613
received a transfusion of 2 units of platelets in March 2015. Family history of coronary heart disease (CHD) was negative. Physical examinations upon admission revealed: body temperature of 36.3°C, pulse rate 62 beats/min, respiratory rate 16 breaths/min, blood pressure 134/71 mmHg, BMI 21.3 kg/m². The patient had a clear consciousness without carotid bruits. Breathing sounds were clear in bilateral lungs, and dry or moist rales were not detected. The area of cardiac dullness was not enlarged upon percussion. The heart rate was 62 beats/min, with regular rhythm and powerful heart sounds, P2 > A2. Murmurs were not observed in the auscultatory valve areas. The abdomen was soft, and liver and spleen were not palpable below the rib. Meanwhile, there was no edema in the 4 limbs. The preliminary diagnosis of ACS and UA (Braunwald B) was then made. The patient took aspirin and ticagrelor for anti-platelet therapy, rosvastatin for lipid-lowering therapy and plaque stabilization, and low-molecular-weight heparin for anticoagulant therapy. The patient had normal results of routine blood test, kidney, and liver function test, as well as CK-MB evaluation after admission, but relatively higher level of anti-β2 glycoprotein I (β2GPI)-IgG level which was 36.8 RU/mL (reference range 0.0–20.0) and negative ACL-IgG level which was 3.0 RU/mL (reference range 0.0–12.0). Coronary angiography indicated right predominance of coronary artery distribution and no apparent stenosis in the left main coronary artery (LM). Linear shadow was observed in the proximal and middle section of the left anterior descending artery (LAD) (Fig. 1) with 80% stenosis. For the first diagonal branch (D1), 50% stenosis was observed and the distal lumen was irregular. For the left circumflex artery (LCX), 50% stenosis was observed in OM1 (first obtuse marginal branch); 90% stenosis in the proximal right coronary artery (Fig. 2); no stenosis in PD, and 50% stenosis in PL. One NeoVas Biodegradable Coronary Scaffold (3.0 × 24 mm) was implanted to proximal right coronary artery (RCA). Dilation was performed with a balloon (Quantum 2.75 × 12 mm with 18 atm). The patient was definitely for life. Another scaffold (2.5 × 24 mm) was implanted to the proximal and middle section of LAD. Dilation was performed with a balloon (Quantum 2.75 × 12 mm with 18 atm). The patient was recommended to receive dual antiplatelet therapy with aspirin 100 mg daily plus ticagrelor 90 mg twice daily for at least 1 year and aspirin 100 mg daily indefinitely for life. No new UA episodes were reported during the follow-up at 6 months, 1 year, and 2 years after discharge, respectively.

3. Discussion

Typically, APS has 3 major presentations: arterial and venous thrombosis; pregnancy loss; thrombocytopenia. Typical changes in laboratory indicators include lupus antibody (LA) in plasma for ≥ 2 times, with a time interval ≥ 12 weeks; moderate-to-high titer IgG/M anticardiolipin (ACL) in serum by standard enzyme linked immunosorbent assay (ELISA) for ≥ 2 times, with a time interval ≥ 12 weeks; IgG/M anti-β2 GPI in serum for ≥ 2 times by standard ELISA, with a time interval ≥ 12 weeks. APS is diagnosed if the patient has one of the above presentations and meets the standard on 1 laboratory indicator. Clinically, APS patients are divided into 4 types: type I, positive for at least one laboratory indicator; type IIa, only positive for LA; type IIb, only positive for ACL; type IIc, only positive for anti-β2-GPI antibody.[1] APS is usually accompanied by a hypercoagulable state. The main pathogenesis of APL is the immunoglobulin that reacts with various negatively charged phospholipid antigens, including ACL and anti-β2 GPI. APL directly binds to the surface of endothelial cells, activating endothelial cells, inducing upregulation of adhesion molecules in endothelial cells. Moreover, through binding to the endothelial cells, APL inhibits the secretion and release of prostacyclin, leading to increased platelet adhesion and expression of tissue factors by monocytes and vascular endothelial cells. As a result, the protein C anticoagulant pathway is inhibited, which further promotes the release of plasminogen activator inhibitor and subsequent fibrinolytic inhibition. Eventually, thrombosis and vascular intimal hyperplasia may occur.[8] The pathology of ACS involves the rupture and
detachment of atherosclerotic plaques, platelet accumulation, and thrombosis. ACS is categorized into UA, ST-segment elevation myocardial infarction and non-ST-segment elevation myocardial infarction. It is hypothesized that the hypercoagulable state resulting from APL contributes to the progression and development of ACS. Evidence has shown that the positive rate of APL and antibody titer were higher in ACS patients than that in normal controls. Greco et al. found that the positive rate and titer of anti-B2GPI antibody were significantly higher in ACS patients compared with controls.

In this study, we reported an ACS case combined with diabetes, hypertension, and old age, all of which are risk factors for CHD. Given the fact that the patient suffered from angina in the last month, it was speculated that several factors led to endothelial dysfunction of the coronary artery and atherosclerosis (intimal hyperplasia), which further resulted in ACS. Coronary angiography revealed linear shadow in the proximal and middle section of LAD (Fig. 1). It was reported in 2017 that 2 linear defects existed in the coronary lesion in an APS patient combined with ACS. Optical coherence tomography (OCT) detected that the lesion was separated by homogenous hyperintense septum into a central lumen and circumferential small channels, suggesting a recanalized thrombus. Intimal hyperplasia was observed as well. This finding was different from the previous report which indicated similar multiple lumens in honeycomb sign in different patients upon OCT. We assume this sign may be unique in these similar multiple lumens in honeycomb sign in different patients among APS patients. Moreover, there was also a significant increase in the post-PCI incidence of adverse vascular events in patients with ACS combined with CHD during long-term follow-up (>1 year).

In our case, the reference diameter of affected coronary artery was relatively high, which was 3.0 mm at the lesion in right coronary artery and 2.5 mm at the lesion in the middle section of LAD. All of them were simple lesions. This patient was negative for APL and the expected incidence of in-stent restenosis and thrombosis was low. So NeoVas Bioresorbable Coronary Scaffold was implanted with dilation at high pressure. Dual antiplatelet therapy was administered post-PCI. No new UA episodes were reported at 6 months or 1 year after surgery, suggesting effective treatment with PCI.

A meta-analysis published on Lancet in 2017 showed that coronary artery diameter <2.25 mm and female sex were independent risk factors for in-stent thrombosis. In 2018, Wang et al. conducted an observation of 31 cases implanted with NeoVas scaffold in PCI over a 1-year period and reported no cardiac death or in-stent thrombosis, except for 1 case who suffered recurrent ischemic events. This finding supports the implantation of NeoVas scaffold as demonstrated in our study.

Given the susceptibility to thrombosis and hypercoagulable state of APS patients, more efforts are needed to develop the optimal individualized therapy for PCI in APS combined with ACS. We still need to extend the follow-up period to assess the prognosis of this patient.

In conclusion, we reported a case of antiphospholipid syndrome combined with acute coronary syndrome and PCI is effective for APS patients and NeoVas scaffold implantation is presumed safe.

**Author contributions**

**Conceptualization:** Yuan Shan, Ping Wang, JingHua Liu.  
**Data curation:** Yuan Shan, Ping Wang, JingHua Liu.  
**Formal analysis:** Yuan Shan.  
**Investigation:** Yuan Shan, Ping Wang, JingHua Liu.  
**Writing – original draft:** Yuan Shan, Ping Wang, JingHua Liu.  
**Methodology:** Ping Wang.  
**Supervision:** Ping Wang, JingHua Liu.  
**Writing – review & editing:** Ping Wang, JingHua Liu.

**Project administration:** JingHua Liu.

**References**

1. Chinese Rheumatology Association Guidelines for the diagnosis and treatment of antiphospholipid syndrome. Chin J Rheumatol 2011;15:407–10.  
2. Djokovic A, Stojanovich L, Kontic M, et al. Association between cardiac manifestations and antiphospholipid antibody type and level in a cohort of Serbian patients with primary and secondary antiphospholipid syndrome. J Int Med Res 2014;42:162–7.  
3. Jurado M, Duran J, Martinez A, et al. Acute myocardial infarction in a man without coronary atheromatosis and antiphospholipid syndrome. Rev Med Clin 2009;137:1478–81.  
4. Bicerogni S, Ildizh Demirbas M, Karaca M, et al. Acute thrombotic occlusion of right coronary and left circumflex coronary arteries in a patient with antiphospholipid syndrome: successful stent implantation. Case Rep Med 2010;2010:918594.  
5. Grzybczak R, Undas A, Roszto P, et al. Life-threatening cardiac manifestations of primary antiphospholipid syndrome. Heart Vessels 2010;25:267–9.  
6. Abid L, Frihka F, Bahloul Z, et al. Acute myocardial infarction in young adults with antiphospholipid syndrome: report of two cases and literature review. Pan Afr Med J 2011;8:13.  
7. Veggelio R, Agurre AD, Abhawal F, et al. Recurrent myocardial infarctions and premature coronary atherosclerosis in a 23-year-old man with antiphospholipid syndrome. Thromb Haemost 2016;115:237–9.  
8. Kontari I, Simmelakis SN, Raisousses NG, et al. Antiphospholipid syndrome; its implication in cardiovascular diseases: a review. J Cardiothorac Surg 2010;5:101.  
9. Greco TP, Conti-Kelly AM, Matsuura E, et al. Antiphospholipid antibodies in patients with coronary artery disease: new cardiac risk factors? Ann NY Acad Sci 2007;1108:466–74.  
10. Greco TP, Conti-Kelly AM, Greco T, et al. Newer antiphospholipid antibodies predict adverse outcomes in patients with acute coronary syndrome. Ann J Clin Pathol 2009;132:613–20.  
11. Ito S, Hassuo T. Intravascular images of coronary stenosis with multiple channels in a patient with antiphospholipid syndrome: the optical coherence tomography findings. Int Med 2017;56:1351–6.  
12. Kimura T, Itoh T, Fuszaki T, et al. A honeycomb-like structure in the coronary arteries in a patient without coronary atheromatosis and antiphospholipid syndrome. Coron Artery Dis 2015;26:356–60.  
13. Suzuki M, Seki A, Nishikawa K, et al. Novel physiological insight into a lotus root appearance in stable coronary artery diseases; report of two cases. Cardiovasc Interv Ther 2016;31:128–30.  
14. Gurlek A, Oded C, Pamur G, et al. Association between anticardiolipin antibodies and recurrent cardiac events in patients with acute coronary syndrome. Int Heart J 2005;46:631–8.  
15. Peril L, Netzer A, Rechaiva E, et al. Long-term outcome of patients with antiphospholipid syndrome who undergo percutaneous coronary intervention. Cardio 2012;122:76–82.  
16. Ali ZA, Serruys PW, Kimura T, et al. 2-year outcomes with the absorb bioresorbable scaffold for treatment of coronary artery disease: a systematic review and meta-analysis of seven randomised trials with an individual patient data subanalysis. Lancet 2017;390:760–72.  
17. Wang XZ, Zhang YJ, Fu GS, et al. One-year clinical outcomes and multislice computed tomography angiographic results following implantation of the NeoVas bioresorbable sirolimus-eluting scaffold in patients with single de novo coronary artery lesions. Catheter Cardiovasc Interv 2018;91:617–22.