Acute Thrombosis After Elective Direct Intracoronary Stenting in Primary Antiphospholipid Syndrome: A Case Report

Ho-Ming Su, Kun-Tai Lee, Chin-Sheng Chu, Sheng-Hsiung Sheu, and Wen-Ter Lai
Division of Cardiology, Department of Internal Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan.

Antiphospholipid syndrome (APS) is an uncommon prothrombotic disorder that has been increasingly recognized in recent years. The diagnosis of APS must be associated with venous or arterial thrombosis or both. Patients with APS usually present with recurrent deep vein thrombosis, pulmonary thromboembolism, thromboembolic stroke, or myocardial infarction. Here, we report a case of a 61-year-old female who presented with a 3-month history of increasingly frequent retrosternal chest tightness. After treadmill test and thallium-201 myocardial perfusion scan, she was admitted and underwent elective coronary angiography but developed acute thrombosis after direct intracoronary stenting. She was successfully rescued with repeat percutaneous transluminal coronary angioplasty and prolonged heparin and glycoprotein IIb/IIIa antagonist use. Laboratory data showed prolongation of partial thromboplastin time and positive anti-cardiolipin antibody. These findings satisfied the criteria for APS; the patient was diagnosed with primary APS because she had neither typical symptoms nor signs of systemic lupus erythematosus or other immunologic disorders. Thereafter, long-term oral anticoagulant appeared to be effective. To our knowledge, this is the first report of acute stent thrombosis in a patient with primary APS.

Key Words: antiphospholipid syndrome, direct stenting, percutaneous transluminal coronary angioplasty, acute thrombosis
(*Kaohsiung J Med Sci* 2003;19:177–82)

Antiphospholipid syndrome (APS) is a disorder characterized by venous or arterial thromboses in different vascular territories and recurrent fetal loss, and accompanied by increased levels of antiphospholipid antibodies [1–3]. The syndrome may be primary or secondary to systemic lupus erythematosus (SLE) [4]. APS has been reported as a potential risk factor for early complication following percutaneous transluminal coronary angioplasty (PTCA) [5], and for early bypass graft failure [6,7]. In contrast, successful PTCA [8] and intracoronary stenting [9,10] have been reported in cases with APS. Whether anticoagulation and intracoronary stenting can entirely prevent acute complication after percutaneous coronary intervention (PCI) in patients with APS is still unknown. We report here a patient with APS who presented with angina and was managed with elective PCI by direct intracoronary stenting over the proximal portion of the left anterior descending (LAD) coronary artery. An acute intra-stent thrombosis developed 30 minutes after PCI and she was treated successfully with repeat

Received: December 11, 2002 Accepted: January 23, 2003
Address correspondence and reprint requests to: Dr. Wen-Ter Lai, Division of Cardiology, Department of Internal Medicine, Kaohsiung Medical University, 100 Shih-Chuan 1st Road, Kaohsiung 807, Taiwan.
E-mail: WT.Lai@cc.kmu.edu.tw

PTCA and additional glycoprotein (GP) IIb/IIIa antagonist use.

Case Presentation

A 61-year-old female patient presented with a 3-month history of increasingly frequent retrosternal chest tightness. She was a nonsmoker and had no other major risk factors for coronary artery disease. Electrocardiogram (ECG) showed a flattened T-wave over leads III, aVF, and V2–V4. Treadmill test, arranged due to chest tightness refractory to medical treatment, revealed a 1–2 mm ST-segment horizontal depression over leads V4 and V5 during exercise stage 3 at a heart rate of 166/minute. Due to the positive treadmill test, aspirin was prescribed. Thallium-201 myocardial perfusion scan showed apical myocardial ischemia. The patient was admitted for coronary angiography (CAG). Laboratory data before CAG showed normal plasma thromboplastin (international normalized ratio, INR, 0.87), normal platelet count (232,000/μl), but abnormal prolongation of partial thromboplastin time (PTT) (65.5/32.5 sec). Heparin (5,000 units) was administered before CAG because the activated clotting time (ACT) was only 162 seconds. CAG revealed 75% stenosis over the LAD proximal portion of the coronary artery (Figure 1A). Under an additional 4,000 units heparin and adequate ACT (292 seconds), direct intracoronary stenting with a Scimed Express stent (Boston Scientific Corporation, Galway, Ireland) was successfully performed and the acute result was optimal (Figure 1B). Unfortunately, 30 minutes after PCI, the patient complained of chest pain and cold sweats refractory to nitrate and morphine. A 12-lead ECG showed ST-segment elevation at V1–V6 and ST-segment depression at II, III, and aVF (Figure 2). The patient was immediately sent to the catheterization room for emergency PTCA under the impression of acute occlusion of the PCI. Repeat CAG revealed total occlusion over the stent site (Figure 3A). Multiple filling defects with thrombus formation were noted after a guide wire was passed through the target lesion (Figure 3B), and GP IIb/IIIa antagonist was given. Emergency balloon angioplasty was performed and the result was satisfactory (Figure 3C). The patient was then given heparin and GP IIb/IIIa antagonist. Due to the abnormal prolongation of PTT, we considered the possibility of APS and revealed the presence of anti-cardiolipin antibody (25.6 GPL/ml) and anti-β2 glycoprotein I antibody, but the absence of lupus anticoagulant antibody. According to clinical presentation and laboratory data, APS was suspected. The patient was treated with low molecular weight heparin followed by an oral anticoagulant (warfarin). She did not complain of further chest pain and she received regular outpatient follow-up after discharge. Antiphospholipid antibody tests 6 weeks later remained positive, with an anti-cardiolipin antibody titer of 153.1 GPL/ml. These findings satisfied the criteria for APS [11], and she was diagnosed with primary APS because she had neither typical symptoms nor signs of SLE or other immunologic disorders.

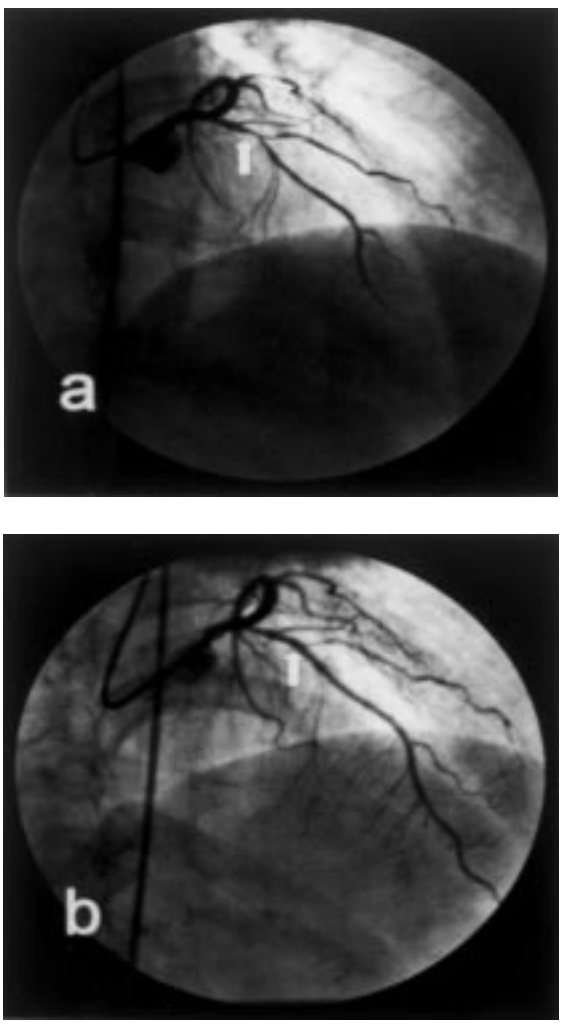

Figure 1. *Coronary angiogram (13° right anterior oblique with 35° cranial angulation) shows: (A) proximal left anterior descending artery with 75% narrowing (arrow); and (B) no residual stenosis in the proximal left anterior descending artery (arrow) after direct stenting.*

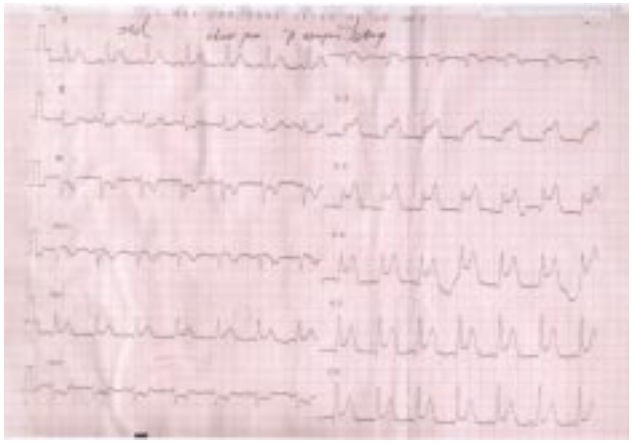

Figure 2. *Electrocardiogram 30 minutes after percutaneous coronary intervention, performed for chest pain, shows ST-segment elevation at V1–V6 and ST-segment depression at II, III, and aVF.*

Discussion

The spectrum of thrombotic disorders in APS spans deep vein thrombosis, pulmonary thromboembolism, stroke, miscarriage, and coronary events [8,12–17]. Possible mechanisms of thrombosis in patients with APS include abnormal platelet aggregation, dysfunction of endothelial cells, and inappropriate function of clotting components such as prothrombin, protein C, antithrombin III, and protein S [3,18].

There have been case reports of acute myocardial infarction in APS patients that have been treated with thrombolytic therapy or with PCI. The Table shows reports of APS cases managed with PCI [12,13]. Of these six cases, early PCI failure occurred in three. APS is a potential risk factor for early complication following PTCA. PTCA with stenting was performed in three cases, of which two were successful and one was not. In the successful cases, intracoronary stenting appeared to be a satisfactory treatment. However, in Case 6, stent restenosis was noted on repeat angiography due to recurrent angina. Therefore, early stent restenosis was still the major complication in APS patients undergoing PCI. In our patient, elective direct intracoronary stenting was performed but acute thrombosis occurred. To our knowledge, this is the first report of acute stent thrombosis in a patient with primary APS.

In our case, clinical symptoms and signs suggest-

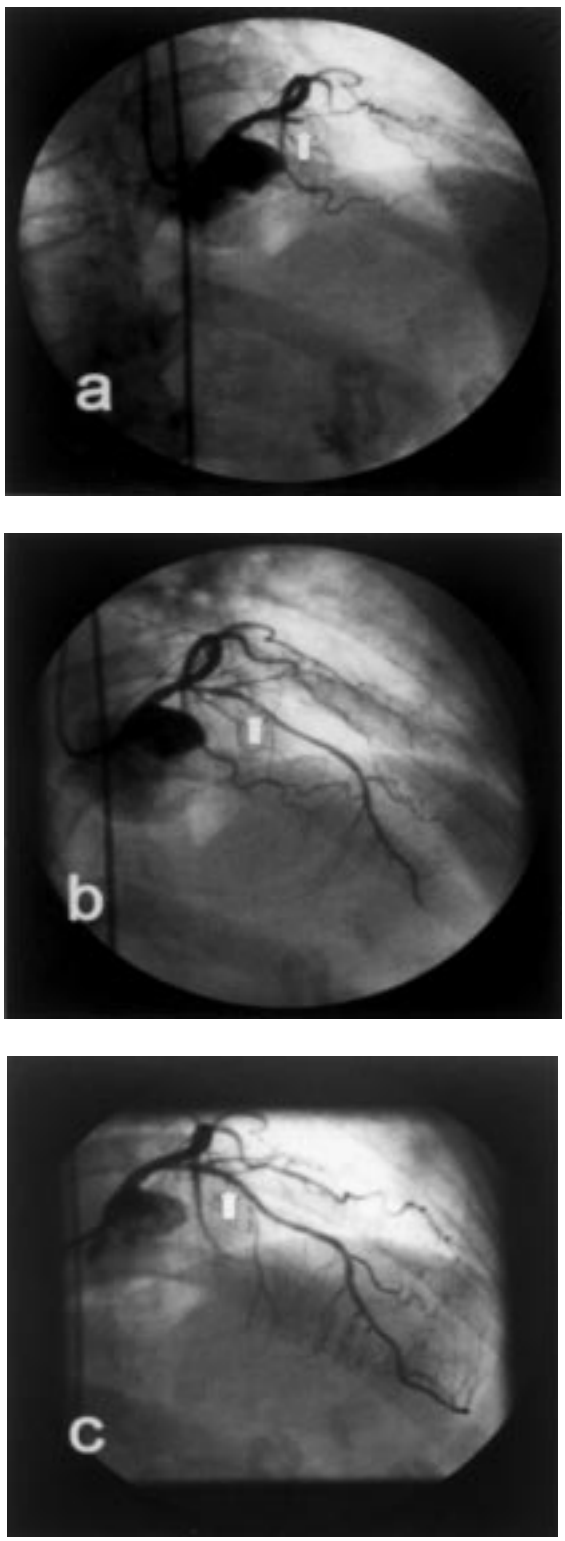

Figure 3. *Coronary angiogram (13° right anterior oblique with 35° cranial angulation) shows: (A) acute thrombosis (total occlusion) over the stent-implanted area (arrow); (B) multiple filling defects with thrombus formation over the target lesion (arrow) after the guide wire was passed through; and (C) optimal results (arrow) after emergency balloon angioplasty.*

Table. Case reports of antiphospholipid syndrome managed with percutaneous coronary intervention

Case	Reference	Age/Sex	Admission diagnosis or presentation	Treatment	Result
1	Anglin et al [5]	40/M	AMI	PTCA	Patient died
2	Chambers et al [12]	56/F	AMI	PTCA	Multiple early PTCA failures, subsequent CABG
3	Takeuchi et al [8]	20/M	AMI	PTCA	PTCA site patent after 3 months
4	Jankowski et al [10]	22/M	AMI	PTCA with stenting	Successful
5	Umesan et al [9]	42/M	Retrosternal chest pain	PTCA with stenting	Successful
6	Kurushima et al [6]	65/M	Exertional angina	PTCA with stenting	Stent restenosis, subsequent CABG

M = male; F = female; AMI = acute myocardial infarction; PTCA = percutaneous transluminal coronary angioplasty; CABG = coronary artery bypass grafting.

ing APS were not noted before CAG, except prolongation of PTT. The prolongation of PTT in patients with APS may cause underuse of heparin during CAG. Therefore, complete survey of the etiology of PTT prolongation is important before CAG. After excluding drug use and coagulation factor deficiency, inhibiting factors such as antiphospholipid antibody are the most likely cause of prolonged PTT. Paradoxically, heparin dose must be elevated in this situation because thrombosis, not bleeding, is the main presentation of this syndrome. In addition, although heparin is not recommended after uncomplicated PCI, prolonged heparin treatment may be beneficial in patients with APS. Before discontinuing heparin treatment, overlapping use of warfarin (to maintain INR at 2.0–3.0) should be considered.

In conclusion, PTCA with or without stenting and long-term oral anticoagulant therapy are the most effective treatments for coronary artery events in patients with APS. However, in our experience, acute thrombosis may occur in these patients in spite of heparin and stent use. The addition of a GP IIb/IIIa antagonist and prolonged heparin treatment are strongly suggested in APS patients undergoing PCI.

References

1. Hughes GRV, Harris EN, Gharvi AE. The anticardiolipin syndrome. *J Rheumatol* 1986;13:486–9.
2. Hughes GRV. The antiphospholipid syndrome, ten years on. *Lancet* 1993;342:341–4.
3. Asherson RA, Cervera R. Primary, secondary and other variants of antiphospholipid syndrome. *Lupus* 1994;3:293–8.
4. Asherson RA, Cervera R. Anticardiolipin antibodies, chronic biologic false positive tests for syphilis and other antiphospholipid antibodies. In: Wallace DJ, Hahn BJS, eds. *Dubois Systemic Lupus Erythematosus*. Philadelphia: Lea and Febiger, 1993:233–45.
5. Anglin P, Strauss BH, Brandwein JM, Watson KR. Lupus anticoagulant: a potential risk factor for complication following percutaneous transluminal coronary angioplasty. *Cathet Cardiovasc Diagn* 1994;31:130–2.
6. Kurushima A, Fudata Y, Horike K, Kanoh M. A difficult case of antiphospholipid syndrome with repeated restenosis of coronary artery and grafts. *Kyobu Geka* 2002;55:883–6.
7. Morton KE, Hrillis SA, Baron DW, et al. Coronary artery bypass graft failure — an autoimmune phenomenon? *Lancet* 1986;ii:1353–7.
8. Takeuchi S, Obayashi T, Toyama J. Primary antiphospholipid syndrome with acute myocardial infarction recanalised by PTCA. *Heart* 1998;79:96–8.
9. Umesan CV, Kapoor A, Nityanand S, et al. Recurrent acute coronary events in a patient with primary antiphospholipid

syndrome: successful management with intracoronary stenting. *Int J Cardiol* 1999;71:99–102.
10. Jankowski M, Dudek D, Dubiel JS, Musial J. Successful coronary stent implantation in a patient with primary antiphospholipid syndrome. *Blood Coagul Fibrinolysis* 1998;9:753–6.
11. Wilson WA, Gharavi AE, Koike T, et al. International consensus statement on preliminary classification criteria for definite antiphospholipid syndrome: report of an international workshop. *Arthritis Rheum* 1999;42:1309–11.
12. Chambers JDJ, Hair WD, Deligonul U. Multiple early percutaneous transluminal coronary angioplasty failures related to lupus anticoagulant. *Am Heart J* 1996;132:189–90.
13. Harpaz D, Glikson M, Sidi Y, Hod H. Successful thrombolytic therapy for acute myocardial infarction in a patient with antiphospholipid antibody syndrome. *Am Heart J* 1991;22: 1492–5.
14. Kattwinkel N, Villanueva AG, Labib SB, et al. Myocardial infarction caused by cardiac microvasculopathy in a patient with the primary antiphospholipid syndrome. *Ann Intern Med* 1992;116:974–6.
15. Harris EN, Graham AE, Asherson RA, et al. Cerebral infarction in SLE, an association with anticardiolipin antibody. *Clin Exp Rheumatol* 1984;2:47–51.
16. Deme GJ, Englert JH, Harris EN. Fetal loss in systemic lupus, association with anticardiolipin antibodies. *J Obstet Gynaecol* 1985;5:207–9.
17. Asherson RA, Mackworth-Young CG, Boey ML, et al. Pulmonary hypertension in SLE. A report of three cases. *J Rheumatol* 1986;12:416–8.
18. Esmon NL, Safa O, Smirnov MD, Esmon CT. Antiphospholipid antibodies and the protein C pathway. *J Autoimmun* 2000;15: 221–5.