A Complex PCI Case with AF Suffering from VLST with NOAC Treatment

Yao Ma* and Lian-Sheng Wang
Department of Cardiology, The First Affiliated Hospital of Nanjing Medical University, Nanjing, PR China

Abstract

According to World Health Organization (WHO), ischemic heart disease is the highest cause of death in the world. As current guidelines recommend, Dual-Antiplatelet Therapy (DAPT) of aspirin and P2Y12 receptor inhibitor should be used at least 1 year in Acute Coronary Syndrome (ACS) patients with or without Percutaneous Coronary Intervention (PCI). We here present a complex PCI case who had complicated with atrial fibrillation (AF) after more than 1 year's DAPT. Then, he took new oral anticoagulants (NOAC) only. Unfortunately, we found total thrombotic occlusion in his right coronary artery (RCA) stents. Finally, he was accepted coronary artery bypass grafting surgery (CABG).

Keywords: Stent thrombosis; Atrial fibrillation; Antithrombotic therapy

Introduction

Antithrombotic therapy is important in the ACS patients whether they undergo PCI or are managed medically [1-3]. However, it is a difficult problem in ACS patients with AF to choose antithrombotic drugs. We present a challenging case who had accepted stents implantation due to acute myocardial infarction (AMI) complicating with AF after more than 1 year's DAPT. After that, he took anticoagulant drugs (warfarin or dabigatran etexilate) only. Unluckily, he still had very late stent thrombosis (VLST) in his RCA stents. We here discuss how to choose antithrombotic drugs in such patients.

Case Report

A 73-year-old man was admitted to our hospital emergency department because of frequent chest tightness and palpitation for two years in Nov 9, 2015. The electrocardiogram (ECG) showed atrial tachycardia (AT) (Figure 1). The patient had accepted percutaneous coronary intervention (PCI) in other hospital implanting three stents due to acute myocardial infarction (AMI) in June 2013: one in the Left Anterior Descending (LAD)(2.5*30 mm RESOLUTE) and two in the right coronary artery (RCA)(5.0*28 mm and 5.0*20 mm TAXUS liberte). After fifteen months of regular dual-antiplatelet therapy (DAPT) of aspirin and clopidogrel, coronary angiography (CAG) showed the stents in his RCA were totally occluded and another two stents (2.5*33 mm FIREBIRD and 3.5*38 mm FIREHAWK) were implanted inside the original stents in September 2014. Then, after 1 year of regular DAPT, he was diagnosed as atrial fibrillation (AF) and he began to take warfarin instead of aspirin and clopidogrel. In October 12, 2015, he was operated with AF radiofrequency catheter ablation (RFCA) in our hospital. His dual-source CT coronary angiography (DSCT-CA) in October 2015 revealed that 60% stenosis of proximal segment and mild stenosis in RCA stents. However, he felt chest tightness and palpitation again and checked ECG still showed AT and brain natriuretic peptide (BNP) was 9927 ng/L in Oct 23, 2015. Four days later, he received electroversion and temporary pacemaker implantation. Before that, doctors changed warfarin with new oral anticoagulants (NOAC), dabigatran etexilate. The patient denied the history of high blood pressure and diabetes mellitus.

After admission, his ECG showed QTc was 470 ms and T-wave had slight inversion in II, III, aVF. His hs-cTnT was 21.58 ng/L, D-Dimer was 0.84 mg/L and International normalized ratio (INR) was 1.25. 24-hour Holter indicated that sinus bradycardia and sinus arrest. In Nov 24, 2015, he re-examined DSCT-CA which indicated 75% stenosis of proximal and middle segment in RCA, but the stents in RCA might be occluded. Then at that night, his CAG showed total thrombotic occlusion in the RCA stents. Then, we decided to operate percutaneous trans luminal coronary angioplasty (PTCA) repeatedly by using balloons of 1.5 × 15 mm Maverick, 2.0 × 20 mm Sprinter and 2.5 × 12 mm Quantum (Figures 2 and 3). We changed NOAC with DAPT of aspirin and clopidogrel immediately after operation. In Nov 27, 2015, he examined emission computed tomography (ECT) which showed his left ventricular ejection fraction (LVEF) was 45%. Finally, he was operated with coronary artery bypass grafting surgery (CABG) and mitral valve replacement and RFCA in Dec 2, 2015.

Discussion

Atherosclerotic cardiovascular disease (ASCVD) is the world’s number one cause of death and disability, and disproportionately affects individuals living in low-income and middle-income countries [4,5]. In China, the prevalence of cardiovascular disease is in a rising phase, and the mortality is high [6]. With the development of PCI and antithrombotic drugs, the mortality of ASCVD has greatly decreased. AHA/ACC [2] recommends that in patients receiving a stent (bare-metal stent (BMS) or drug-eluting stent (DES)) during PCI, aspirin...
revascularization (percutaneous or surgical), it may be reasonable to...

In 2014, AHA/ACC/European Society of Cardiology (ESC) [1] provided evidence on the extension of DAPT after DES implantation beyond 1 year. P2Y12 inhibitor administration in addition to aspirin beyond 1 year may be considered after careful assessment of the bleeding and ischemic risks in the patient.

Then, how to choose antithrombotic drugs in acute coronary syndrome (ACS) patients with AF? As current guidelines recommend, triple-antiplatelet therapy (TAPT), including DAPT and oral anticoagulant (OAC), often applies to patients with non-valvular AF. Limited data suggest that the use of new P2Y12 inhibitors would increase the risk of major bleeding, and thus, clopidogrel would be the preferred P2Y12 inhibitor. Such recommendations are ambiguous and need to be improved in this area. This is indeed a complex problem, because guidelines do not point out clearly how to choose antithrombotic drugs in patients with ACS who have accepted anticoagulation with antiplatelet drugs. The current guidelines [1,2,10] are discussing more about the choice of antithrombotic drugs before and after PCI in patients who have already developed AF before ACS attacks them. In spite of this, these guidelines and consensuses are limited in leading such patients to choose appropriate antiplatelet and anticoagulation drugs to balance ischemia and bleeding. Even worse, guidelines for antithrombotic therapy in patients with AF who undergo PCI and stents implantation are still poorly followed in clinical practice [12]. Unfortunately, current guidelines rarely mention the choice of antithrombotic agents in ACS patients who have accepted PCI operation complicating with AF after 1 year of DAPT. Such patients are in an embarrassing position: OAC alone or dual therapy or triple therapy. In 2014, an European consensus [13] just mentioned that in an ACS patient who develops new onset AF, and is at high stroke risk (CHA2DS2-VASc > 2), OAC should be started, whether with a VKA or NOAC. Limited data suggest that use of the new P2Y12 inhibitors would increase the risk of major bleeding, and thus, clopidogrel would be the preferred P2Y12 inhibitor. Such recommendations are ambiguous and guidelines do not point out clearly how to choose antithrombotic drugs in patients with ACS after PCI complicating with AF. Guidelines need to be improved in this area. This is indeed a complex problem, because we have to take into account the risks from two aspects. One is the risk of stroke and major cardiovascular events (such as recurrent MI, stent restenosis and stent thrombosis) the other is the risk of bleeding (Cerebral or gastrointestinal bleeding). It is a challenge for cardiologist to weigh the advantages and disadvantages in clinical application.

References

1. Roffi M, Patrono C, Collet JP, Mueller C, Valgimigli M, et al. (2015) 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: Task Force for the Management of Acute Coronary Syndromes in Patients Presenting without Persistent ST-Segment Elevation of the European Society of Cardiology (ESC). Eur Heart J 37(3): 267-315.

2. Amsterdam EA, Wenger NK, Brindis RG, Casey DE, Ganiats TG, et al. (2014) AHA/ACC Guideline for the Management of Patients with Non-ST-Elevation Acute Coronary Syndromes: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 64(24): e139-228.

3. Sibbing D, Kastrati A, Berger PB (2015) Pre-treatment with P2Y12 inhibitors in ACS patients: who, when, why, and which agent?.
4. Yusuf S, Wood D, Ralston J and Reddy KS (2015) The World Heart Federation's vision for worldwide cardiovascular disease prevention. Lancet 386(9991): 399-402.

5. GBD 2013 Mortality and Causes of Death Collaborators (2015) Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 385: 117-171.

6. Jiang L, Krumholz HM, Li X, Li J, Hu S (2015) Achieving best outcomes for patients with cardiovascular disease in China by enhancing the quality of medical care and establishing a learning health-care system. Lancet 386: 1493-1505.

7. Hamm CW, Bassand JP, Agewall S. (2011) ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: The Task Force for the management of acute coronary syndromes (ACS) in patients presenting without persistent ST-segment elevation of the European Society of Cardiology (ESC). Eur Heart J 32(23): 2999-3054.

8. American College of Emergency P, Society for Cardiovascular A, Interventions, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: executive summary: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 61(4): 485-510.

9. Staudacher DL, Kaiser M, Hehrlein C, Bode C, Ahrens I (2015) Triple Antithrombotic Therapy after Percutaneous Coronary Intervention (PCI) in Patients with Indication for Oral Anticoagulation: Data from a Single Center Registry. Plos one 10(10): e0140101.

10. January CT, Wann LS, Alpert JS, Calkins H, Cigarroa JE, et al. (2014) AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. J Am Coll Cardiol 64(21): e1-76.

11. Ruff CT, Giugliano RP, Braunwald E, Hoffman EB, Deenadayalu N, et al. (2014) Comparison of the efficacy and safety of new oral anticoagulants with warfarin in patients with atrial fibrillation: a meta-analysis of randomised trials. Lancet 383: 955-962.

12. Ancedy Y, Lecoq C, Saint Etienne C, Ivanes F, Angoulvant D, et al. (2016) Antithrombotic management in patients with atrial fibrillation undergoing coronary stent implantation: What is the impact of guideline adherence? Int J Cardiol 203: 987-994.

13. Lip GY, Windecker S, Huber K, Kirchhof P, Marin F, et al. (2014) Management of antithrombotic therapy in atrial fibrillation patients presenting with acute coronary syndrome and/or undergoing percutaneous coronary or valve interventions: a joint consensus document of the European Society of Cardiology Working Group on Thrombosis, European Heart Rhythm Association (EHRA), European Association of Percutaneous Cardiovascular Interventions (EAPCI) and European Association of Acute Cardiac Care (ACCA) endorsed by the Heart Rhythm Society (HRS) and Asia-Pacific Heart Rhythm Society (APHRS). Eur Heart J 35: 3155-3179.