Intracoronary thrombus visualized by optical coherence tomography in a patient with antiphospholipid syndrome

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ABSTRACT

A patient with a history of deep venous thrombosis on warfarin underwent coronary angiography and was found to have a red intracoronary thrombus in the mid left anterior descending artery by optical coherence tomography. Percutaneous coronary intervention was successfully performed. On discharge, the patient continued triple therapy with aspirin, clopidogrel, and apixaban for 30 days then discontinued aspirin. A hypercoagulable work up was notable for antiphospholipid syndrome and lifelong anticoagulation was recommended. The patient continued apixaban twice daily given recurrent thrombosis while on warfarin and was event free at 6-month follow up.

KEYWORDS

coronary thrombosis, antiphospholipid syndrome, anticoagulation

Introduction

Coronary thrombosis is often a result of plaque rupture with the formation of thrombosis at the site of rupture. Intracoronary thrombosis can also occur in hypercoagulable states such as antiphospholipid syndrome (APS) or heparin-induced thrombocytopenia. APS is a clinical autoimmune syndrome associated with thrombosis and pregnancy complications in the presence of antiphospholipid antibodies. The standard of care for thrombotic prevention in patients with APS are vitamin K antagonists (VKAs) [1, 2]. The evidence regarding the use of direct oral anticoagulants (DOACs) in APS is sparse. Data from the RAPS (Rivaroxaban in Antiphospholipid Syndrome) trial suggests that rivaroxaban may be comparable to VKAs in reducing thrombotic events [3]. Additional randomized control trials have shown increased risk of thrombosis in patients treated with rivaroxaban when compared to VKA [4, 5]. Despite VKA therapy, patients can have recurrent thrombosis with varying rates from 3% to 24% [6]. We describe a case of a patient noted to have an intracoronary thrombus while on warfarin. The publication of the patient-based case report was approved by the institutional review board.

Case description

The patient is a 70-year-old male with medical history of rheumatoid arthritis, type 2 diabetes mellitus, hypertension, hyperlipidemia, and unprovoked deep venous thrombosis on warfarin,
who presented for a coronary angiography procedure. The patient had been experiencing symptoms concerning for accelerating angina and had an abnormal nuclear perfusion stress test. International Normalized Ratio (INR) was 1.6 on the day of the procedure. Coronary angiography demonstrated a 70% eccentric stenosis and hazy filling defect in the mid segment of the left anterior descending artery with TIMI flow of 3 (Fig. 1A). During wiring of the vessel, the patient had a transient episode of chest pressure, which was relieved with intracoronary nitroglycerin. Optical coherence tomography (OCT) was performed to further characterize the lesion given the concern for thrombus versus dissection. OCT showed no evidence of dissection and high backscatter consistent with red thrombus in the mid left anterior descending artery (Fig. 1B and Fig. 1C). Direct stenting was pursued given the possibility of healed plaque rupture and angina symptoms. A 3.0 × 16mm drug-eluting stent was deployed successfully at high pressure. OCT was performed after stent deployment, which revealed that the stent was well apposed to the vessel wall. The patient tolerated the procedure well without any complications.

The patient reported excellent adherence to his warfarin regimen with INR maintained between 2.0 and 3.0 prior to stopping warfarin for the procedure. Given new occurrence of intracoronary thrombus, which may represent an embolism while on warfarin, he was transitioned to apixaban 5 mg twice daily and warfarin was discontinued. On discharge, he continued triple therapy with aspirin, clopidogrel, and apixaban for 30 days then discontinued aspirin. He underwent a hypercoagulable workup which was notable for antiphospholipid syndrome and he was recommended lifelong anticoagulation therapy. The patient had an initial positive cardiolipin IgM antibody with a titer of 42. Cardiolipin IgG and IgA antibody were negative. Lupus anticoagulant and anti-Beta 2 glycoprotein were negative. Repeat antibody testing was performed 6 months later and demonstrated cardiolipin IgM antibody with a titer of 16. The patient was continued on dual antiplatelet therapy with aspirin and clopidogrel given placement of coronary stent. Aspirin was continued for thirty days post-stent placement and then discontinued as patient was to continue apixaban and there is limited data as to the optimal management regimen of dual antiplatelet therapy in combination with oral anticoagulants in these patients. The patient was further investigated for arrhythmias and intracardiac shunting which were negative. When seen for his 6-month follow up visit, the patient was chest pain free and without any evidence of additional thrombosis. Because of recent data suggesting that the risk of thrombosis is increased in patients with triple positive antiphospholipid syndrome, his anticoagulation therapy was re-evaluated by Hematology, but since he did not have a triple positive test and since the patient had an arterial thrombosis on warfarin, there is no clear answer to the best management. The patient was continued on apixaban which he preferred and tolerated well.

Fig. 1. 70% eccentric lesion of the mid segment of the left anterior descending artery seen on coronary angiogram (Figure A). Thrombus of the mid segment of the left anterior descending artery. High backscatter resulting in high attenuation as evident by shadow beyond the thrombus is consistent with red thrombus (Figure B and Figure C)
Discussion

The role of DOACs in APS is not fully understood. There are many implications in the use of VKAs such as drug interactions and INR monitoring which makes DOACs an appealing choice for anticoagulation. The current recommendation for secondary thromboprophylaxis in patients with APS and arterial thrombosis is treatment with VKA with a target INR goal of 2–3 or 3–4 [7]. The data targeting higher INR values is limited and guidelines recommend considering the individual’s bleeding risk [7]. This patient developed intracoronary thrombosis despite adherence to warfarin with sustained target levels of INR between 2.0 and 3.0 and on low dose aspirin. There is limited data on the best treatment options for recurrent arterial thrombosis despite VKA and low dose aspirin regimen. It is important to distinguish triple antiphospholipid positivity as rivaroxaban should not be used in these patients. The TRAPS trial demonstrated a higher risk of thrombotic events in patients treated with rivaroxaban compared to warfarin in patients in these high risk individuals [5]. Given lack of triple positivity APS and the development of thrombus while on warfarin, the decision was made to transition the patient to apixaban twice daily and continue life-long treatment. Further studies are needed not only to clarify the role of DOACs in patients with APS (i.e. ASTRO-APS study, which is currently on hold) but also in managing these patients after percutaneous coronary intervention. Moreover, advanced imaging techniques such as OCT can further differentiate between red and white thrombi [8]. Although there is no clear clinical implication of this differentiation, this may likely change in the future. Quadros et al., studied the clinical outcomes of red versus white thrombi in patients with ST-elevation myocardial infarction and found that 30-day mortality was lower in patients with white thrombi than red thrombi [9]. The difference in thrombus composition may have implications not only for prognosis but also for the choice of the treatment regimen in the future. This may help guide adjunctive therapies such as P2Y12 receptor inhibitors’ role in patients with APS and recurrent arterial thrombosis.

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REFERENCES