Dabigatran as the anticoagulant of choice for treating acute myocardial infarction in a patient with ectatic coronary artery and thrombus

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ABSTRACT

BACKGROUND

The efficacy of dabigatran in treating acute myocardial infarction (AMI) of patient with coronary artery ectasia (CAE) and thrombus was assessed.

CASE PRESENTATION

A 56-year-old man presented chest pain on admission was diagnosed with AMI. Emergency coronary angiography showed ectasia over left main, left anterior descending and left circumflex arteries with Thrombolysis In Myocardial Infarction (TIMI) 1-2 flow. There was a large ectatic Shepherd's Crook right coronary artery (RCA) with total thrombotic occlusion at the mid segment. In view of the large ectatic and tortuous RCA with abundant thrombus within, intervention with angioplasty and thrombectomy would not yield a good result. Hence anticoagulant therapy was decided upon. Treatment of the myocardial infarction are as per guideline with dual antiplatelet therapy (DAPT). He was prescribed dabigatran, a novel oral anticoagulant (NOAC), instead of warfarin. His chest pain responded well with the above medical treatment. The coronary angiography repeated 3 months later revealed that the patency of the vessel was restored but with TIMI 1-2 flow established throughout with the culprit 90% lesion seen at the posterior descending artery (PDA). Medical treatment continued with dabigatran and clopidogrel. Last review was 7 months after the AMI and the patient was doing well.

CONCLUSIONS

The treatment outcome of dabigatran was encouraging whereby the thrombus at mid segment of RCA resolved and patient remained asymptomatic, suggesting that dabigatran may be considered over warfarin in the treatment of CAE.

BACKGROUND

Coronary artery ectasia (CAE) is a vascular phenotype that is infrequently observed in patients who undergo coronary angioplasty.[1] It is characterised by disturbed coronary blood flow as a result of the abnormal dilatation of vessel.[2] CAE was observed in 3.0% of patients with AMI.[1] Indeed patients with underlying CAE are found to have higher occurrence of cardiac death and nonfatal myocardial infarction.[1] We reported this case of a 56-year-old man who presented with AMI with underlying CAE and was treated medically and initiated dabigatran as the anticoagulant of choice instead of the conventional warfarin.[3] To the best of our knowledge, this is the first case report in Malaysia using NOAC in the treatment of generalized ectatic vessel presenting as a Cardiac event.

CASE PRESENTATION

A 56-year-old male patient presented with severe, crushing chest pain 4 hours after the onset on 27/12/2018. His risk factors were smoking and hypertension. Upon physical examination, his heart rate was 60 bpm and arterial blood pressure was 90/60 mmHg. Chest and heart examinations revealed nothing unusual. The troponin T level was elevated (300ng/L).

His initial electrocardiogram (ECG) showed ST-segment elevation in leads II, III and AVF in sinus rhythm. Patient was transferred to the cardiac catheterization laboratory for primary intervention.

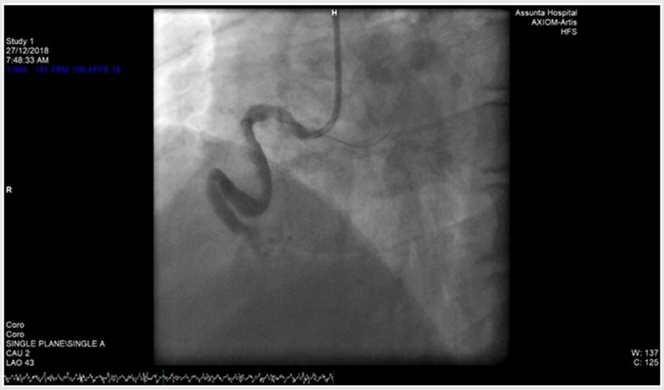
Emergency coronary angiography showed ectasia of left main artery (LM) along with ectasia of left circumflex and left anterior descending artery with TIMI 1-2 flow only. There is also a large ectatic Shepherd's Crook RCA with total thrombotic occlusion at the mid segment.

Figure 1: Coronary angiogram showing severe ectasia of left anterior descending (LAD) artery in RAO VIEW

Figure 2: Coronary angiogram showing severe ectasia of LAD artery in AP caudal view

Figure 3: Coronary angiogram showing severe ectasia of RCA in AP cranial view

Figure 4: Coronary angiogram showing severe ectasia of RCA in LAO view



Due to angiographic evidence of a heavy thrombus burden and the Shepherd Crook RCA, thrombectomy and angioplasty (stent implantation) in ectatic vessels do not seem to be an effective intervention. Stenting an ectatic vessel with plentiful thrombus will worsen the thrombus burden and the stent will be occluded off early. More over the vessel size is too ectatic measuring about 6.0mm in diameter and the largest DES stent available today measures only 4.5mm in diameter. Hence deploying an under-size stent will have a very high risk of stent thrombosis.[4] Hence, we decided to opt for medical treatment.[4] He was anticoagulated with subcutaneous enoxaparin along with oral aspirin and ticagrelor. Further management of this patient are as per se the guideline of myocardial infarction.[5] His chest pain relieved significantly following medical therapy.

The maximum Creatine kinase-MB (CK-MB) was 89ng/ml in day 2 from 16.93ng/ml on admission and decreased to 16.12ng/ml in day 3.

He developed complete heart block in day 3 and was easily treated with a temporary pacing via the right femoral approach. The heart rhythm recovered after day 5 in CCU. His recovery progress onwards in the ward was good as he was asymptomatic with no cardiac cause of medical attention. In view of the ectatic RCA with thrombus burden and the slow flow to the ectatic left coronary vessel, long term anticoagulation would be an option of treatment. Nevertheless, the role of dual antiplatelet therapy with additional therapeutic anticoagulation in the management of patients with CAE, is still an area of ongoing debate. The anticoagulant used in most of these cases is warfarin.[1]

However, warfarin has a narrow therapeutic window depending on the International Normalised Ratio (INR). Moreover, warfarin has significant drug-drug and drug-food interactions. Since this is an off label use of dabigatran, a thorough discussion with this patient about the choice of anticoagulant came with an informed consent that he opted for dabigatran as the anticoagulation therapy instead of warfarin.

The plan of the anti-thrombotic regime is DAPT with anticoagulant for 1 month followed by a single antiplatelets and anticoagulation for the next 6 month. After that anticoagulation onwards for life. He was discharged with ticagrelor 90mg BID, aspirin 100mg OD and dabigatran 150mg BID, followed by a statin and an ACE inhibitor on 6/1/2019. He was reviewed again at the outpatient clinic regularly on 14/1/2019 and 28/1/2019 and remained asymptomatic. He was advised for a follow up coronary angiogram. Because of financial constraint, he was transferred to a public hospital for a follow up coronary angiogram on 2/4/2019.

Figure 5: Coronary angiogram showing severe ectasia of RCA in RAO view with a 90% lesion at the PDA branch LAO view

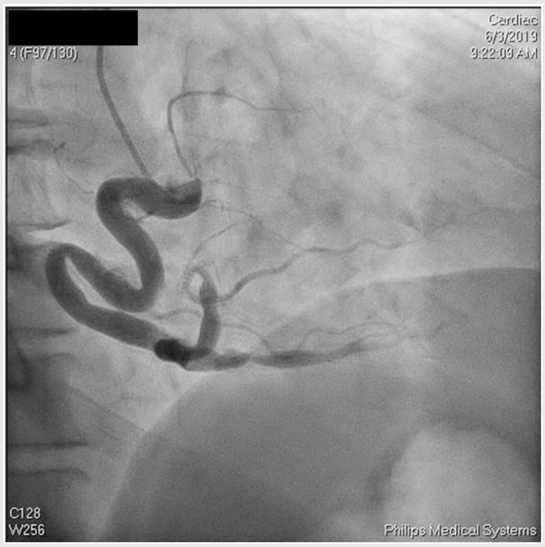
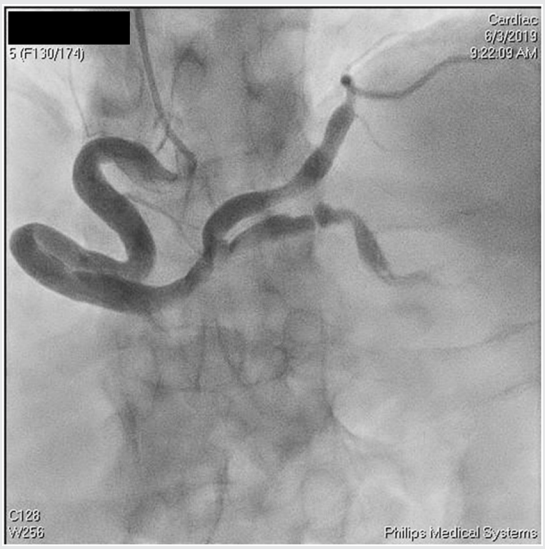


Figure 6: Coronary angiogram showing severe ectasia of RCA in AP cranial with a 90% lesion at the PDA branch LAO view



The repeat coronary angiogram showed TIMI 1-2 flow to the left coronary vessel. As for the RCA, the patency of the vessel was restored but with TIMI 1-2 flow established throughout the artery, similar as the left coronary system with the culprit 90% lesion seen at the posterior descending artery (PDA) only. In view of the single lesion distally involving a branch , it was felt that continue medical treatment would be a better option. As reviewed on 19/7/2019, he was keeping well without any cardiac events. Currently His antithrombotic regime is dabigatran and clopidogrel.

DISCUSSION

Warfarin as an anticoagulant has it challenges. Its narrow therapeutic index makes warfarin less effective and succumb to risk of bleeding especially intracerebral bleeding. Hence, with warfarin administration, close monitoring of INR is needed and it is rather troublesome and time consuming for certain patients, especially those with busy work schedule and commitment. Drug-drug and drug-food interaction that observed in warfarin has to be taken into consideration especially Asian diet, for instance ginger, soya and garlic and some traditional medications that are commonly used in this region that were known to lower the INR and compromise the anticoagulant effect.[6]

Dabigatran is more favourable than warfarin as we can do away with regular INR monitoring like in the case of maintenance with warfarin. Dabigatran poses less if no risk for drug-drug interaction or drug food interaction as what applies to warfarin. Dabigatran has a lower risk of major bleedings like intracerebral and gastrointestinal bleedings as compared to warfarin.[7] One precaution of dabigatran that has to be aware is contraindication in patient who has renal impairment especially with eGFR < 30 ml/min/1.73m^2.

CONCLUSION

Dabigatran and DAPT were used in this case on top of other recommended treatment for myocardial infarction. After 4 months of dabigatran treatment, the thrombus at mid segment of RCA resolved (evidenced by the repeat angiogram) and patient remained asymptomatic. This results suggest dabigatran may be considered over warfarin in the treatment of CAE with thrombus.[3] Further investigation is warranted to evaluate the clinical efficacy of NOAC over warfarin as the anticoagulation therapy in CAE patients.

KEYWORDS
dabigatran, oral anticoagulants, acute myocardial infarction, coronary artery ectasia

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