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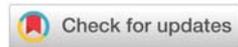
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## Case Report

# Stent thrombosis associated with newer P2Y12 inhibitors (Ticagrelor & Pasugrel) in a STEMI patient

## Abstract

We report a 54-year-old Kuwaiti male presented as inferior wall ST elevation myocardial infarction (STEMI). Patient was loaded with Clopidogrel 600mg by the first medical contact. After primary percutaneous intervention patient was loaded with Ticagrelor 180 mg with intravenous (IV) glycoprotein IIb/IIIa inhibitor infusion for 24 hours. Patient has several episodes of stent thrombosis during the consecutive days. As a result of this complications it was decided to switch Ticagrelor to Pasugrel and was loaded with 60mg of Pasugrel. On Pasugrel also patient had stent thrombosis and hence heart team was activated and decided to go for emergency coronary artery bypass graft surgery. This case report emphasizes the Ticagrelor and Pasugrel related stent thrombosis and management.

## Introduction

Ticagrelor and Pasugrel related Stent thrombosis are reported rare [1]. When comparing to existing P2Y12 inhibitors stent thrombosis with ticagrelor is comparatively less. In PLATO trial 2.94% of the patient who were on Ticagrelor had stent thrombosis [2]. When comparing Pasugrel with clopidogrel, it was found to have reduced rates of ischemic events and stent thrombosis at the cost of increased risk of bleeding. While comparing ticagrelor to clopidogrel the reduction of stent thrombosis was greater with ticagrelor for late ie more than 30 days and subacute ie 24 h to 30 days with no effect on acute stent thrombosis which is less than 24 hours [3,4].

## Case Report

We report a 54-year-old Kuwaiti male with no past medical history presented as inferior wall ST elevation myocardial infarction (STEMI). Patient was referred from a local hospital and was already loaded with Clopidogrel 600mg. On examination he had no symptoms of congestive heart failure. He was conscious & oriented. Blood Pressure (BP) = 160/80mmHg, Heart Rate (HR) = 88/min, Saturation = 98 % on room air, Temperature = 37.2°C. On cardiac examination no abnormal heart sounds or murmur's detected. Lung fields were clear. A chest X-ray demonstrated no cardiomegaly, no pulmonary venous congestion, nor effusions. Baseline laboratory investigations showed *white blood cells* (WBC) = 10.2 10<sup>9</sup>/L (Ref. range: 4-10 10<sup>9</sup>/L), hemoglobin = 124 (Ref. range:

130-170 g/L), Platelet Count = 330 10<sup>9</sup>/L (Ref. range: 150-410 10<sup>9</sup>/L) h<sub>s</sub>-Troponin-i = >100 ng/mL (Ref. range: 0.01-0.04ng/mL). He was taken to the Cath lab for Primary percutaneous coronary intervention (PCI) and did angioplasty of the left anterior descending coronary artery (LAD) with implantation of one drug eluting stent (DES) *BioMatrix Flex™ 3.0 X 28* (Figure 1). Right coronary artery was non dominant and free of lesions. Left circumflex artery also appeared free of lesions. Following this patient was loaded with Ticagrelor 180 mg. Patient was kept on intravenous (IV) glycoprotein IIb/IIIa inhibitor infusion for 24 hours. After 36 hours patient again had severe chest pain with dynamic ECG changes and was taken to the Cath lab on an emergency basis and did angioplasty of the LAD for treating stent thrombosis (Figure 2). Patient had four more similar episodes during the consecutive days (Figures 3-5). All these events happened whenever the treating team tried to wean off IV Tirofiban. It was decided to switch Ticagrelor to



**Figure 1:** Thrombus in LAD and Diagonal treated by placing a Stent in LAD across Diagonal.

Pasugrel and was loaded with 60mg of Pasugrel. As patient was already on dual antiplatelet drugs with IV Tirofiban infusion on flow it was decided to hold IV Tirofiban infusion after the initiation and loading of Pasugrel. Four hours later patient was again taken to the Cath lab and had angioplasty (Figure 6). Heart team was activated and decided emergency coronary artery bypass graft (CABG) as the optimal treatment strategy. CABG was done successfully with left internal mammary artery (LIMA) to LAD and saphenous vein graft (SVG) to 1<sup>st</sup> Diagonal (D<sub>1</sub>). This case report emphasizes the possibility of Ticagrelor and Pasugrel resistance or platelet dysfunction.

## Discussion

This case mainly focusing on the difficulties during the management of possible ticagrelor and prasugrel in the setting of multiple episodes of stent thrombosis while they were on there P2Y12 inhibitors. Testing for P2Y12 inhibitor resistance is a challenge as each drug has its own specific properties and

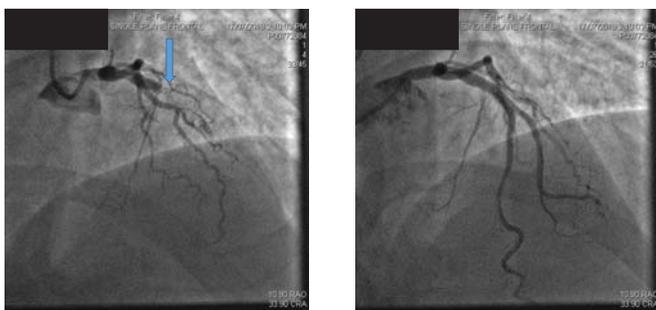


Figure 2: Instent Thrombosis treated by thrombus aspiration and angioplasty (kissing balloon).

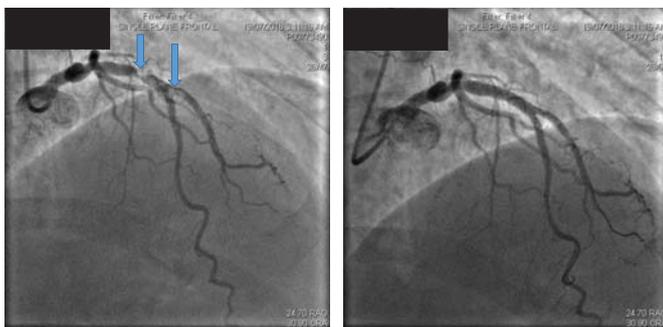


Figure 3: Day 4 : Instent Thrombosis at bifurcation treated by angioplasty (kissing balloon).

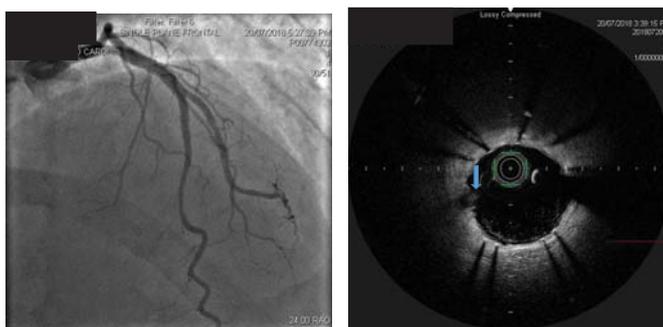


Figure 4: Traces of thrombus.

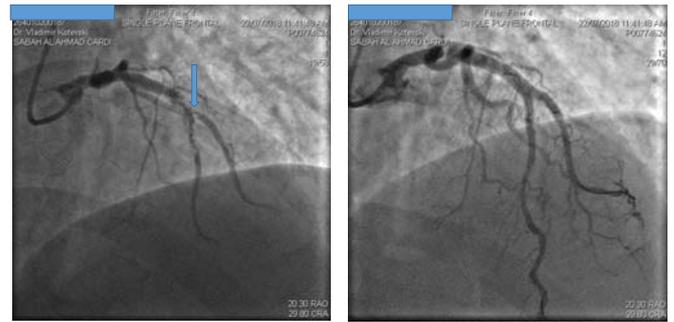


Figure 5: Day 6: Instent Thrombosis treated by thrombus aspiration and angioplasty.

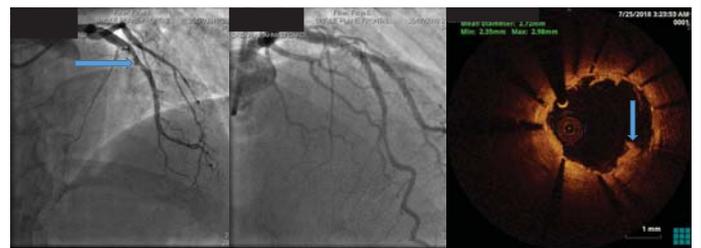


Figure 6:

no common test is available so far in terms of reactivity and resistance. This case mainly focusing on the difficulties during the management of ticagrelor and prasugrel resistance which is proven by multiple episodes of stent thrombosis. We didn't perform whole blood luminescence aggregometry (WBLA), thrombelastography platelet mapping (TEG) and platelet reactivity. Testing for P2Y12 inhibitor resistance is a challenge as each drug has its own specific tests and no common test is available so far interms of reactivity and resistance [5]. High on-treatment platelet reactivity (HTPR) associated with in-stent restenosis (ISR) during acute myocardial infarction [6]. For clopidogrel platelet reactivity can be assessed by using VerifyNow P2Y12 test. There are reported studies where VerifyNow test used for both ticagrlor and clopidogrel [7]. Both WBLA and TEG can be used to identify P2Y12 resistance especially for ticagrelor [8].

## Conclusion

P2Y12 inhibitors associated stent thrombosis is not uncommon. Newer molecules like ticagrelor also cannot prevent the stent thrombosis and in such cases early activation of the heart team is appropriate. We need more studies to understand the exact mechanism behind the cause of newer P2Y12 inhibitors associated stent thrombosis.

## Author's contributions

MAJ participated in manuscript preparation. RR participated in data analysis and manuscript preparation. RD participated in data acquisition. VK did the manuscript review. NA participated in drafting of manuscript. IMK participated in data acquisition. AM participated in data acquisition. All authors had access to data and take responsibility for the integrity of data and the accuracy of data analysis. All authors have read and approved the manuscript.

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