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Coronary No-Reflow Following Percutaneous Intervention

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INTRODUCTION

- Primary percutaneous coronary intervention (PCI) is the gold standard of treatment of ST segment elevation myocardial infarction (STEMI).
- PCI restores thrombolysis in myocardial infarction flow 3 (TIMI 3) in over 90% of patients [1].
- However, in rare instances, coronary revascularization does not lead to coronary reperfusion, instead there is a further decrease of coronary blood flow.
- The cause of no-reflow can be classified into four main pathogenetic components: distal athero-thrombotic embolization, ischemia-related and/or reperfusion-related injury, and the susceptibility of coronary microcirculation to injury.
- The purpose of this case report is to show early and clear identification of the no-reflow and follow its management. It can occur in up to 10% of cases of primary PCI and is associated with an increased 30 day mortality if not adequately treated (32% vs. 2.8%, p<.001) [2].

CASE REPORT

- A 76-yr-old female presented to the emergency department with new-onset substernal chest pain over 3 days.
- Her primary care physician initially diagnosed her with GERD, but then her chest pain acutely worsened and she developed dyspnea on exertion as well.
- PMH: hypertension, hyperlipidemia, type 2 diabetes mellitus, Raynaud’s disease, rheumatoid arthritis, degenerative joint disease, and Sjogren’s disease.
- Vital Signs: blood pressure 52/44, pulse of 122, respiratory rate of 20, temperature 36.8 C, and SpO2 100% on room air.
- Physical Exam: findings were unremarkable.
- EKG: On admission showed an anterolateral wall ST-elevation myocardial infarction (STEMI) for which she had to be taken emergently for left heart catheterization.
- Hospital Course: During PCI, she had a drug-eluting stent (DES) placed to 100% lesion of the proximal LAD but there was no re-flow following placement.
- The patient became bradycardic, hypotensive, and agonal; within a few minutes she had two episodes of cardiac arrest with return of spontaneous circulation (ROSC) achieved with CPR, epinephrine, and atropine.
- She then had to be sedated and intubated, started on a norepinephrine bitartrate drip for hypotension.
- For her no re-flow after stenting and coronary vasospasm, she was treated with intracoronary nicardipine, adenosine, and eptifibatide.
- There was subsequent placement of IABP which was upgraded to a right femoral artery Impella®. Unfortunately, there was subsequent development of Impella® site bleeding and a right groin hematoma.
- On Day 2 of hospitalization, the patient’s MAP dropped below 65 with increasing pressor requirements. CBC showed Hb 5.5 following 8 units of pRBC, which was concerning for acute blood loss, and patient’s right groin hematoma was expanding to the abdominal wall and down her right thigh.
- At this point, the patient was urgently transferred to University of Pennsylvania for further evaluation.

IMAGING

- Figure 1: Acute 100% occlusion of LAD
- Figure 2: Drug eluting stent placed
- Figure 3: Intracoronary infusion of nicardipine, adenosine, and eptifibatide, with minimal improvement. TIMI Score 1-2

DISCUSSION

- For our patient, PCI did not lead to the usual and expected restoration of coronary blood flow.
- She had evidence of angiographic no-reflow phenomenon characterized by evidence of slow-flow in the affected vessel (TIMI flow equal to or less than 2) and lack of contrast uptake “blush” by the subtended myocardium, leading to a potential dissociation between coronary revascularization and myocardial perfusion in STEMI [3].
- There are several treatment options for no re-flow, although it is not known which treatment is best.
- Current medical treatment options are the following: injection of adenosine (dilator of arteries and arterioles), nitropresside sodium (relaxes arteries and veins), and verapamil (smooth muscle dilator) [2, 3].

CONCLUSION

- The prognosis and presentation of patients with coronary no-reflow can vary.
- For the last few decades, treatment of no-reflow has been mostly pharmacotherapy-based, without much success. There is a poor prognostic effect of no-reflow causing an increase in five-year mortality from 9.5 to 18.2 percent.
- This case depicts why it is important to recognize coronary no-re-flow early and to continue exploring treatment options.

REFERENCES