OBJECTIVE: Vasoplegic shock syndrome (VSS) is a well-recognized life-threatening complication during and after cardiopulmonary bypass (CPB). While VSS pathophysiology following CPB has been extensively discussed, the mechanism of action of VSS after off-pump coronary artery bypass graft (OPCABG) is not well-known. We report the case of severe refractory VSS after OPCABG successfully treated with an infusion of Hydroxycobalamin.

METHODS: A 77 years old gentleman underwent elective OPCABG (skeletonized LIMA to LAD, skeletonized RIMA to OM in situ, and RSVG to PDA) for severe three vessels coronary artery disease. Preoperative LV ejection fraction was 28%, and before surgery, the patient was referred to the heart failure outpatient department for optimization of pharmacological therapy, starting 2 weeks before surgery sacubitril/valsartan titrated then to the highest dose. Pre-operative IABP was placed. Surgery was uneventful and by the end of the procedure, TEE showed improved biventricular contractility.

RESULTS: The patient was transferred to ICU with IABP and without inotropic support. After around one hour, the patient developed hypotension initially addressed with fluid management and low-dose vasopressor, but both failed to improve the hemodynamic. No bleeding was observed. TEE ruled out any pericardial tamponade and confirmed fair contractility. Norepinephrine was titrated to a medium-high dose, vasopressin was started and a Swan-Ganz catheter was placed. SVR was 480 dyn/cm5/s. Despite aggressive pharmacologic treatment no improvements in MAP (< 50 mmHg) and SVR were noticed. Methylprednisolone 200 mg boluses were injected at regular intervals. Infusion of Methylene blue was started without success. 10 g of Hydroxycobalamin (labeled used for cyanide poisoning) were administered as IV infusion by central line. After around 30 minutes, MAP started rising and reached 60-65 mmHg. One hour later MAP was improving and hemodynamic status reassessment showed SVR > 800 dyn/cm5/s. In the next following hours, the SBP reached levels above 90 mmHg. Vasopressors were gradually reduced and blood lactate levels decreased.

CONCLUSIONS: Our case demonstrated the importance of recognizing severe refractory VSS also in cardiovascular procedures without the use of CPB. Moreover, Hydroxycobalamin played a crucial role in restoring homeostasis in such a challenging situation. The usage of this molecule in similar settings could be paving the way for the next research.

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Severe refractory Vasoplegic shock syndrome

**Causes**

- CPB
- OPCABG
- LOW EF
- DIABETES MELLITUS
- SACUBITRIL-VALSARTAN
- ACE-I

**Treatment**

- Norepinephrine
- Vasopressin
- Methylprednisolone
- Methylene blue
- Hydroxocobalamin

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**Severe Refractory Vasoplegic Shock Syndrome After OPCABG Successfully Treated With Hydroxycobalamin**

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