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From Cardiogenic Shock To Dual Organ Transplants: Managing Heparin-Induced Thrombocytopenia With Therapeutic Apheresis and IVIG

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Background: Heparin-induced thrombocytopenia (HIT) is a serious adverse effect of heparin therapy that complicates the management of patients on mechanical circulatory support (MCS) and/or cardiac surgery. We present a patient with cardiogenic shock (CS) who developed HIT while on Impella and successfully underwent heart and kidney transplants after therapeutic apheresis (TA) and intravenous immune globulin (IVIG) therapy.

Methods: A 64-year-old man with ischemic cardiomyopathy and ejection fraction 15% was admitted to the local hospital for recurrent ventricular tachycardia (VT), and was transferred to our center in CS. He underwent an emergent Impella CPs placement complicated by large hemolysis and acute kidney injury, requiring initiation of continuous renal replacement therapy (CRRT). The patient was then transitioned to an Impella 5.5. Two days after Impella placement and heparin initiation, he developed thrombocytopenia and systemic and purge solution were switched to argatroban. With initial negative HIT panel, heparin infusion was re-introduced, which led to an acute fall of his platelet count, clotting of the CRRT circuit and new extensive lower extremity deep vein thrombosis. Repeat HIT panel was positive and systemic argatroban and purge solution bicarbonate were started. Within 48 hours of initiation of the bicarbonate solution, the Impella purge reservoir was broken, which required a purge bypass repair (Figure 1) and subsequent Impella 5.5 pump exchange. Patient was emergently listed for heart and kidney transplants. After 3 consecutive TA treatments, HIT panel became negative (Table). One does of TA followed by IVIG was given within 24 hours prior to the heart transplant and second dose of IVIG was given intraoperatively to minimize the immunologic impact of heparin while the patient was on cardiopulmonary bypass for the heart transplant.

Results: The heart and kidney transplants were successful; the patient was started on argatroban postoperatively and discharged home on fondaparinux bridged to warfarin for 3 months.

Conclusion: This case highlights the complexity of managing HIT in patients on temporary MCS devices, and a possible treatment solution to allow for a brief heparin exposure during heart transplant.

Table: Heparin antibody assay

Date	Optical Density (negative<0.400)	Functional Assay (negative<20%)	Interpretation
8/27/2021	0.851	2%	false negative
9/3/2021	1.896	62%	positive
9/13/2021 Pre-TA	1.603	7%	positive
9/13/2021 s/p 1st TA (15 minutes after TA completion)	0.672	1%	positive
9/15/2021 s/p 3rd TA (15 minutes after TA completion)	0.171	not indicated	negative