WORSENING HEART FAILURE IN A BIVENTRICULAR ASSIST DEVICE PATIENT: GETTING TO THE ROOT OF THE PROBLEM

Poster Contributions
Poster Hall B1
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Background: The use of mechanical circulatory support in advanced heart failure as bridge to transplant and destination therapy is growing. As such, rapid troubleshooting of complications related to a ventricular assist device (VAD) may be life saving.

Case: A 43-year-old male with two Heartware® VADs used as a biventricular assist device (BiVAD) presented for evaluation of low-flow alarms. His past history included Hodgkin’s lymphoma complicated by chemotherapy-induced cardiotoxicity and progressive heart failure requiring BiVAD implantation under emergency approval for compassionate care 3 years prior to presentation. On examination, he was noted to have an elevated jugular venous pulsation, profound inspiratory crackles, and cool extremities. There were appropriate humming mechanical sounds with an unremarkable appearance to the driveline entry sites of the BiVADs. His clinical status deteriorated rapidly requiring intubation and inotropic support for cardiogenic shock.

Decision Making: Laboratory data indicated a lactate dehydrogenase level at the upper limit of normal. The review of the BiVAD waveforms demonstrated low-flows for the BiVADs. The persistence of left VAD low-flow alarms in the setting of normal output power suggested a potential outflow obstruction. Echocardiogram demonstrated severe biventricular dysfunction with aortic valve opening with each beat, raising suspicion of VAD-associated malfunction. The patient proceeded to computed tomographic imaging, confirming a stenosis of the outflow cannula at the anastomosis site with the aortic root. Transesophageal echocardiographic-assisted percutaneous stenting of the outflow graft was performed to relieve the obstruction. Left VAD flows, hemodynamics, and the patient's clinical status rapidly improved.

Conclusion: This case illustrates the power of understanding the changes in hemodynamics with mechanical circulatory support in conjunction with multimodality imaging in order to diagnose a rare VAD-associated complication. The long-term durability of these support devices remains unknown with potential complications requiring a structured and multi-disciplinary approach to problem-solving.