# THROMBOSIS IN THE HEARTWARE PUMP: CLINICAL PRESENTATION AND MANAGEMENT DECISIONS

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# *Background and Objectives:* Continuous flow Left ventricular assist devices (CF-LVAD) are being increasingly used for the management of End-stage Heart failure. Increased durability of the devices has heightened the awareness of complications like gastrointestinal bleeding and VAD thrombosis. We describe the use of Computed Tomographic Angiography (CTA) to diagnose pump thrombus in an asymptomatic patient with normal Plasma Free Hemoglobin (PFHb) and Lactate Dehydrogenase (LDH) but with abnormal pump parameters.

# *Case:* 66 year Caucasian male who is a nursing home resident with history of Coronary artery disease (CAD), Stage D Heart Failure S/p LVAD- HeartWare, Chronic kidney disease-stage 3, Diabetes Mellitus-Type 2, admitted for evaluation and management of low flow alarms of one-day duration. Plasma free hemoglobin and LDH on admission were with in normal range. Patient was fluid resuscitated with no improvement in pump flows. Transthoracic echocardiography (TTE) showed poor Left ventricular function and abnormal RAMP study. CTA showed partially obstructive thrombus in the proximal portion of LVAD outflow cannula. Anticoagulation with Heparin was pursued until therapeutic International Normalized Ratio (INR) of 2.5-3.5. Additionally, Aggrenox was added and Aspirin was continued with normalization of pump parameters prior to discharge.

# *Conclusion:* LVAD Pump thrombosis carries substantial morbidity and mortality. Despite excellent sensitivity and specificity of elevated LDH and PFHb for diagnosis of pump thrombosis some patient-associated factors or location of the thrombus within the VAD may affect the test results. Nevertheless, both our case and published evidence to date support that no single test can reliably exclude diagnosis of VAD thrombosis. While echocardiography provided a clear indication that the VAD was not functioning normally, we propose that addition of gated cardiac CT in select cases is a valuable tool in the early diagnosis of pump thrombosis when the index of suspicion is high.

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