**MYOCARDIAL RECOVERY DURING VENTRICULAR UNLOADING IN PATIENTS WITH CHRONIC CARDIOMYOPATHY: ASSESSMENT OF CARDIAC IMPROVEMENT AND WEANING FROM VENTRICULAR ASSIST DEVICES**

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During ventricular assist device (VAD) support, end-stage failing hearts can recover at molecular and cellular level and occasionally also translation of these changes into functionally stable cardiac recovery allowing long-term freedom from heart failure recurrence after VAD removal is possible. Weaning from VADs is a clinical option with potential successful results for >20 years, even if cardiac recovery remains incomplete and chronic cardiomyopathy was the underlying cause for VAD implantation. Echocardiography and right heart catheterization (RHC) are paramount for assessment of relevant cardiac improvement and essential for weaning decisions. There are many useful parameters for cardiac recovery assessment and prediction of long-term weaning success, but to date there is no gold standard for recovery assessment. Nevertheless, left ventricular (LV) ejection fraction ≥45% and end-diastolic diameter ≤55mm, measured at rest during ”off-pump trials”, are generally accepted as basic criteria for left ventricular LVAD explantation and their stability for 2-4 weeks after maximum improvement is also accepted as an important requirement. Other off-pump echo-parameters of cardiac function (including tissue Doppler and strain imaging data) and LV geometry, as well as their pre-explant stability (between and during off-pump trials after maximum improvement) are helpful for weaning decisions. Normal and stable hemodynamics during off-pump RHC trials is necessary for weaning decisions, but not sufficiently predictive for long-term cardiac stability after VAD explantation. Off-pump CI >2.5L/min/m² and PCWP <14mmHg are accepted as major requirements for VAD explantation. HF history-length ≥ 5 years is one of the major risk factors for HF recurrence after VAD explantation. There are two major limitations for a potential future use of VADs as a therapeutic strategy aimed to reverse HF: first, the low probability of relevant cardiac recovery, even after additional use of drugs known to enhance reverse remodeling and second, the fact that recovery is not predictable before VAD implantation.