Candidate for LVAD the art of Patient Selection

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Despite great efforts, end-stage heart failure (HF) remains a leading cause of morbidity and mortality. However, treatment of advanced heart failure refractory to medical therapy is essentially limited to heart transplantation and LVAD. With significantly limited donor heart availability, many patients die while waiting. Recent advances in technology and out-comes with VADS have markedly changed the approach to advanced heart failure management. We reported 3 cases with non-ischemic cardiomyopathy with chronic heart failure symptoms, recovered their LV systolic function after LVAD heart mate-II implantation and LV recovered to have LVAD explanted. In conclusion, improvement in clinical and surgical expertise in LVAD has improved the quality of life in well selected patient with advanced (HF) with bridge-to-recovery, LVAD has shown promising results of improved functional capacity, quality of life and survival, however, successful LVAD in advanced (HF) is crucially dependent on proper patient selection.

Mechanical circulatory support has become a more and more common technique of supporting patients with advanced heart disease. Overriding to the recent progress discovered with this medical care has been a larger understanding of patient choice criteria as a primary determinant of early and late patient outcomes. Before device implant, patients ought to endure a multidisciplinary analysis of vessel, non-cardiovascular, and psychosocial factors that influence surgical outcomes. the utilization of multivariable risk scores may additionally be helpful to guide discussions with patients and families concerning the relative risks of various therapeutic alternatives. Despite AN proof base that gives guiding principles in patient choice for automatically power-assisted circulation, many aspects of the analysis need more refinement, together with development of tools to objectively assess psychosocial parameters, and definition and validation of measures of right cavum dysfunction that preclude productive isolated left cavum support. Nearly 6 million Americans live with heart failure (HF), and it is estimated that over 200,000 have refractory end‐stage disease (stage D) with a 1‐year mortality between 70% and 90%.

The gold standard treatment for end‐stage HF remains cardiac transplantation. However, most patients are either ineligible for transplant secondary to age or comorbidities or will not receive a transplant because of a critical shortage of suitable donor organs. The inadequacy of pharmacologic and electrical therapies to favorably impact outcomes in advanced HF coupled with the limited supply of transplantable hearts has driven development and clinical application of mechanical circulatory support (MCS). While MCS is commonly used to describe left ventricular assist devices (LVADs), it also includes right ventricular assist devices (RVADs), biventricular assist devices (BiVADs), percutaneous devices, and total artificial hearts.

An important issue addressed prior to device implantation is the ultimate goal of the therapy Traditionally, patients with ventricular assist devices (VADs) have been grouped into one of two general categories: (1) those listed for transplant who deteriorate and require a VAD (bridge‐to‐transplant [BTT]), and (2) those ineligible for transplant who receive a VAD as their terminal HF therapy (destination therapy [DT]). The growing cohort of patients with advanced HF coupled with the shortage of suitable donor organs and improvements in VAD technology can be reasonably anticipated to shift patients away from BTT toward DT in coming years.

The requirement to determine a patient's transplant candidacy prior to device implantation stems back to the clinical trial designs used in the United States. However, the disconnect between these designations and clinical VAD utilization is demonstrated in

Indications for ventricular assist device (VAD) implantation during the first 36 months of the Interagency Registry of Mechanically assisted Circulatory Support (INTERMACS) registry.5 The most common reason for device implant in the second observation period was bridge to candidacy. Destination therapy accounts for a relatively small proportion of all devices implanted in the United States.

Whereas in the current era, the majority of patients with implants were classified as "bridge‐to‐decision" candidates. Bridge‐to‐decision patients are typically patients in critical cardiogenic shock in urgent need of additional hemodynamic support or those with a comorbidity that is thought to likely resolve with mechanically assisted circulation. In these settings, determination of transplant candidacy is deferred for a period until the patient recovers from the physiological insult of shock and/or has the opportunity to reverse comorbid conditions such as renal dysfunction or pulmonary hypertension, Finally, a relatively small proportion of patients with a disease process that is anticipated to be self‐limited may have a VAD implanted with the intention of removal following myocardial recovery ("bridge to recovery").

Regardless of the preoperative goals for therapy, the characteristics of patients who require MCS are similar. The clinical challenge is selecting patients with a sufficient severity of illness to derive benefit from a VAD while simultaneously avoiding patients so ill that their likelihood of survival is not enhanced with MCS. To address this issue more thoroughly, the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) investigators developed a novel and more granular classification scheme to prospectively classify advanced HF patients based on severity of illness at the time of device implant ranging from critical cardiogenic shock to stable ambulatory HF. INTERMACS is a national database that has been collecting data on MCS patients since 2006 and currently includes information on more than 2850 unique patients.

Abbreviations: INTERMACS, Interagency Registry for Mechanically Assisted Circulatory Support; NYHA, New York Heart Association.5

To date, the majority of INTERMACS enrollees have the most severe degrees of hemodynamic compromise (profiles 1 and 2), which are associated with the highest 12‐month post‐implant mortality. Recognition of the heightened mortality risk with critically ill patients has refocused many programs on patients in earlier stages of HF. The third INTERMACS Annual Report confirms a shift to implantation in earlier stages of HF with a decrease in proportion of profile 1 patients from 35% to 17% in the contemporary era. Another interesting observation in INTERMACS that is yet to be completely explained is that profile 3 patients who are "stable on inotropes" have the lowest 12‐month mortality rates. It may be that individuals who are able to achieve clinical stability on inotropic support for brief periods actually have physiologic recovery of organ function and improvement in nutritional parameters that favorably impacts postoperative outcomes.

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