PERIOPERATIVE CARE OF LVAD

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Introduction Continuous-flow left ventricular assist devices (LVADs) have emerged as the standard of care for advanced heart failure patients requiring long-term mechanical circulatory support or as bridge to transplant. Evidence-based clinical management of LVAD is becoming increasingly important for optimising outcomes.

Preoperative management Pre-implant optimisation of comorbid conditions is vital in minimising the incidence and severity of post-operative adverse events and for enhancing survival.1 This includes psychosocial and behavioural screening prior to surgery. Pre-operative education will prepare patient to be self-reliant after device implant.2

Intraoperative management Transoesophageal echocardiography (TEE) is essential for identifying valvular pathology and intracardiac defect which may require correction during LVAD implant.1,3 Inotropic support should be tailored to the TEE and pulmonary artery catheter findings. A combination of inotropes, inodilators, vasoconstrictors and nitric oxide may be needed and used with care to protect and preserve right ventricular function.

Postoperative management The principles of long-term care include assessment and management of LVAD function, haemodynamics, anticoagulation, arrhythmias, infections, and psychosocial factors.1,4 Echocardiography is critical in determining optimal pump position and speed setting, and in diagnosing problems with the patient-pump interface.1 Immobilising the percutaneous lead and exit site care to prevent exit site trauma reduces infection risk.4 Cardiac rehabilitation is an important component in returning patients to the community. Summary The success of LVAD support depends on not only surgical implant technique but also judicious pre-operative evaluation/preparation and vigilant management of both immediate and long term post-operative issues. This can be accomplished through the comprehensive care from a multidisciplinary team.

REFERENCES

IMAGING OF LVAD COMPLICATIONS: EXPERIENCE FROM MAYO CLINIC

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Left ventricular assist devices (LVADs) are mechanical support devices for patients with end-stage heart failure. Echocardiography plays a pivotal role in different aspects including patient selection, perioperative imaging guidance, management of complication, optimisation of LVAD efficacy and assessment of ventricular recovery.1

Post-surgical transthoracic echocardiography (TTE) evaluation should be performed for assessing overall structure and haemodynamics of left and right heart, valvular regurgitation, inflow and outflow cannula evaluation and intracardiac thrombus detection. Small LV dimensions post LVAD support, as demonstrated by marked deviation of interventricular septum towards the left side may signify excessive high pump speed. Right ventricular function evaluation after LVAD implantation is crucial as it may paradoxically worsen due to excessive LV unloading.

New-onset aortic regurgitation (AR) occurs in approximately 25%–30% of patients one year after LVAD implantation.2 It not only causes adverse effects on LVAD performance but also increases future morbidity and mortality.3 Assessment of AR is technically challenging in LVAD patients. Regurgitant fraction is superior to traditional TTE parameters (e.g. vena contracta) in assessing LV filling pressures.4 As for cannula evaluation, high Doppler velocity >1.5 m/s at inflow may result from malposition or flow obstruction whereas low velocity may indicate inflow cannula thrombosis. Outflow graft abnormality should be suspected when the Doppler velocity >2 m/s. Although adequate anticoagulation is indicated post LVAD implantation, there is still risk of intra-cardiac thrombosis. The typical sites of thrombus formation include the atria, LV apex and aortic root.

REFERENCES

PRINCIPLES OF EXTRACORPOREAL LIFE SUPPORT (ECLS)

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Based on the principle of cardiopulmonary bypass (CPB), short-term circulatory support was developed to supplement cardiac and/or respiratory failure. Extra Corporeal Life Support (ECLS) involves the use of mechanical devices to temporarily support heart or lung function during cardiopulmonary failure, leading to organ recovery or replacement. Though the circuitry setup configurations represented by the different techniques are closely related, extracorporeal membrane oxygenation (ECMO) aims to support the failing lungs, while extracorporeal life support (ECLS) aims to support the failing heart. ECMO primarily affect oxygenation and decarboxylation of blood, while ECLS has a circulatory and a respiratory effect. The cannulation sites will essentially distinguish these two types of assistance. Venovenous ECMO (VV-ECMO) is used for respiratory failure only while venoarterial ECMO (VA-ECMO) is used for ECLS to provide support for heart failure or cardiopulmonary failure. VV-ECMO is mainly implemented in patients with severe acute respiratory distress syndrome (ARDS) unresponsive to conventional medical treatment while the most frequent indication for VA-ECMO is represented by causes of cardiogenic shock refractory to medical
In patients with severe aortic stenosis (AS) requiring aortic valve replacement (AVR), a reduced pre-operative left ventricular ejection fraction (LVEF) is one of the most meaningful risk indicators of early and late mortality. Although low LVEF is a predictor of increased mortality, the majority of patients with low LVEF, which is 14 cases, were analysed. The pre-operative baseline characteristics of these patients were as follows: mean age 67 years ± 10.2; n=9 male patients (64.3%); n=8 were in NYHA functional class ≥III; mean LVEF 29% ± 5.4 (range, 19–35); n=3 on haemodialysis. Mortality prediction using euroSCORE II was 10.8% ± 13.0 (range, 1.78–47.7). There was one operative death in a haemodialysis patient using a euroSCORE II of 47.7%; the others were discharged uneventfully. During follow-up (mean 4 years ± 2.6), one patient with haemodialysis died due to sudden death. Latest LVEF of survivors was 58% ± 10.0 (range, 36–75).

Although low LVEF is a predictor of increased mortality for patients with AS, our experience showed acceptable outcomes compared with the previously reported literature.

REFERENCES

CHINESE TRANSLATION AND VALIDATION OF SCALES FOR LEFT VENTRICULAR ASSIST DEVICE (LVAD) SELF-EFFICACY AND ADHERENCE

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Left ventricular assist device (LVAD) is an alternative therapy for patients with end-stage heart failure. Patients with LVADs must manage a complex regimen of care, including activities regarding self-care maintenance (e.g., activities related to lifestyle and LVAD system operation), self-care monitoring (e.g., monitoring for LVAD device/system and complications), self-care management (e.g., handling alarms). Emerging data have indicated the increasing use of LVAD among patients in the Chinese-speaking population. Instruments that specifically measure self-efficacy for and adherence to LVAD care regimen are required to identify the unmet needs of patients and advance the science of LVAD care in Chinese-speaking countries. Here, we report the translation and initial validation of four measurement instruments designed to assess the self-efficacy for and adherence to the LVAD care regimen of patients and their care-givers. A validation study plan and the research and practice implications of the four measurement instruments in emerging Chinese-speaking populations are discussed.

SUPPORTIVE CARDIOLOGY: AN INNOVATIVE PRACTICE MODEL TO INTEGRATE PALLIATIVE CARE INTO THE MANAGEMENT OF ADVANCED HEART FAILURE

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OBJECTIVES
To investigate for any distinctive symptom clusters among patients with advanced heart failure (HF) and the independent relationships with their quality of life (QoL).

METHODS
This is the secondary data analysis of a cross-sectional study which interviewed 119 patients with advanced HF in the geriatric unit of a regional hospital in Hong Kong. The symptom profile and QoL were assessed by using the Edmonton Symptom Assessment Scale (ESAS) and the McGill Quality of Life Questionnaire (MQOL). Exploratory factor analysis was used to identify the symptom clusters. Hierarchical regression analysis was used to examine the independent relationships with their QoL, after adjusting for age, gender and co-morbidities.

RESULTS
Patients were at an advanced age (mean 82.9 years, standard deviation 6.5). Three distinct symptom clusters were identified: the distress cluster (including shortness of breath, anxiety, and depression), the decondition cluster (fatigue, drowsiness, nausea, and reduced appetite), and the discomfort cluster (pain and a sense of generalised discomfort). These three symptom clusters accounted for 63.25% of variance of the patients’ symptom experience. Low to moderate correlations between these symptom clusters indicated that they were rather independent of one another. After adjusting for age, gender and co-morbidities, the distress (β = 0.635, p = 0.001), decondition (β = 0.148, p = 0.01) and discomfort (β = 0.258, p < 0.001) symptom clusters independently predicted patients’ QoL.

CONCLUSION
This study identified the distinctive symptom clusters among patients with advanced HF. The results shed light on the need to develop palliative care interventions for optimising symptom control for this life-limiting disease.