Beyond the Bridge

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Abstract:

Left ventricular assist devices (LVADs) implanted for patients as destination therapy have been shown to improve quality of life and survival, improve functional status, and prolong survival in patients with end-stage heart failure.[1,2] The indications for LVADs include bridge to recovery for patients who need short-term support, bridge to transplant for patients awaiting a heart transplant, and destination therapy for patients ineligible for cardiac transplantation. Originally developed as a bridge to heart transplant, permanent LVAD implantation as destination therapy is the fastest growing indication for device implantation, particularly as the population ages and more patients are diagnosed with end-stage heart failure (see *What's an LVAD?* and *When an LVAD is needed*).[1]

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Left ventricular assist devices (LVADs) implanted for patients as destination therapy have been shown to improve quality of life and survival, improve functional status, and prolong survival in patients with end-stage heart failure.[1,2] The indications for LVADs include bridge to recovery for patients who need short-term support, bridge to transplant for patients awaiting a heart transplant, and destination therapy for patients ineligible for cardiac transplantation. Originally developed as a bridge to heart transplant, permanent LVAD implantation as destination therapy is the fastest growing indication for device implantation, particularly as the population ages and more patients are diagnosed with end-stage heart failure (see *What's an LVAD?* and *When an LVAD is needed*).[1]

Despite improved outcomes, patients with LVADs may experience complications such as stroke, infection, and multiple organ failure. Patients treated with LVADs as destination therapy may choose to terminate LVAD support (elective LVAD deactivation) due to complications, which may cause confusion and raise ethical issues for not only the patient and family members but also the healthcare team.[3]

In order to properly serve this patient population's unique physical and emotional needs, protocols and processes for end-of-life care are desperately needed, but currently lacking.[4,5] This article outlines ways to implement an evidence-based, proactive palliative care model prior to LVAD implantation. The model addresses the ethical implications of LVADs as destination therapy, clarifies the goals of care, assists in informed decision making, and helps to meet the emotional and spiritual needs of the patient, family, and healthcare team.

Destination therapy improves survival

The benefits of destination therapy were first established in the Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure trial. Following this study, LVADs were approved by the FDA for destination therapy and subsequently approved by the Centers for Medicare and Medicaid for end-stage heart failure.[1]

The selection criteria for LVAD implantation include evaluating the patient's clinical status, taking into consideration the severity of heart failure signs and symptoms and determining the operative risk. Careful patient selection for LVAD implantation improves survival and clinical manifestations. As more devices were approved, the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) was started. It represents over 100 implantation centers and 5,000 patients with devices. INTERMAC reports have shown LVAD therapy offers improvement in survival for patients with refractory heart failure or cardiogenic shock as a bridge to heart transplantation or as destination therapy.[10] The process of evaluating and selecting patients for LVAD therapy was directly related to outcome. Identifying appropriate patients before the onset of significant organ dysfunction improves survival and reduces the degree of postoperative morbidity.[10]

Patients on destination therapy have survival rates similar to heart transplant survival rates.[3] At the Mayo Clinic, 2-year survival rates among LVAD patients is as high as 74%, making it a promising long-term treatment for end-stage heart failure.[5] For patients who achieve successful outcomes with destination therapy, the transition from a terminal prognosis in the setting of end-stage heart failure to living well after LVAD implantation becomes a reality.[5]

Ethical dilemma of LVAD deactivation

Despite improving survival rates for patients with end-stage heart failure on destination therapy, some patients can experience serious complications that may compromise the patient's quality of life, necessitating deactivation of the LVAD.[5] Ethical objections to the deactivation of an LVAD may arise based on the nature of the device. An LVAD can be seen as replacement therapy, not unlike a heart transplant: long-term, continuous, and supporting the function of a failing organ. Consequently, withdrawal of LVAD support may be seen by patients, family members, and the healthcare team as assisted suicide. But LVADs shouldn't be categorized as replacement therapy as the device requires external sources of energy and expert control, and doesn't respond to physiologic changes in the patient.[4] When a patient dies from deactivation of an LVAD, the cause of death is the underlying disease process, in this case end-stage heart failure.[4]

End-of-life planning

Discussions of end-of-life decision making are critical for patients receiving destination therapy. Initiating the conversation prior to LVAD implantation gives the patient an opportunity to envision an acceptable end of life and make peace with the consequences of LVAD deactivation.[2] Unfortunately, the goals of care aren't always well defined for patients receiving destination therapy. Patients may not have an advance directive that addresses complications that can occur after LVAD implantation. If patients' wishes aren't clarified, destination therapy may only serve to maintain circulation in a deteriorating patient. Patients can benefit from palliative care consultations prior to LVAD implantation to clarify end-of-life preferences, assist in care planning and symptom management, and maximize quality of life.[5]

Proactive palliative care conferences are valuable in setting expectations for care and avoiding potential ethical dilemmas. In a study completed at the Mayo Clinic, the palliative medicine team devised a preparedness plan for patients receiving destination therapy.[5] The focus was on issues unique to destination therapy and included advanced care planning to assist patients and their family members to think about potential psychosocial and financial concerns, caregiving considerations, quality of life, and ethical issues. Special attention was given to the potential for clinical complications and advance care preferences, including blood transfusions and long-term mechanical ventilation. Device failure and complications of therapy were explored and discussed along with the patient's psychosocial concerns and spiritual and religious beliefs. Expectations for care were established. These advance care planning discussions were documented by the palliative medicine team and social worker, and advance directives were included in the patient's medical record.

Once destination therapy was implemented, the palliative medicine team continued to follow up and meet with patients to focus on enhancing quality of life, including symptom management and ongoing goals assessment. When adverse events occurred, the team helped to implement the patient's individual preparedness plan to manage symptoms and support the patient and family.[5]

Nursing considerations

Opportunities are available for nurses to improve care for patients receiving destination therapy by facilitating open communication and advocating for advance care planning with patients and their families. The informed consent process is an important part of the preparation for destination therapy. Nurses can help to clarify discussions that patients had with healthcare providers about the risks and benefits of LVAD, including how therapy can affect caregivers. Potential physical, psychological, and financial concerns need to be thoroughly discussed. Nurses must ensure that both patients and their family members understand the issues and have all of their questions answered.

Nurses can advocate for advance care planning conferences with the palliative care team at the time of informed consent. In the event that the LVAD is deactivated, early involvement of the palliative care team can facilitate the transition of care.[11]

Nursing care should include ongoing assessment of the patient's clinical status and his or her knowledge of destination therapy and the underlying illness. Nurses should ensure that patients and their family members understand that destination therapy isn't curative. Nurses will need to effectively communicate that the purpose of destination therapy is to improve quality of life. Assessment of patient and family concerns and priorities related to LVAD therapy helps to clarify the goals of care. The perceived benefits of destination therapy should also be assessed, including symptom relief, increased time spent with family, and prolonged life. Changes in patient's attitudes and wishes and their perceptions of the benefits of destination therapy need to be periodically reassessed followed by a care conference with the multidisciplinary team. Ongoing evaluation of the risks and benefits of destination therapy can improve planning and decision making regarding future care.[12]

Some patients and families may not understand that an LVAD isn't a cure for heart failure. In some cases, nurses may need to address problems with health literacy, posttraumatic stress disorder, or post-intensive care syndrome before patients and families can make informed decisions about destination therapy.[13–15]

One author [16] recommends that nurses use a Zen parable to help patients and families understand and cope with living with a life-threatening condition.[13] The parable reads as follows [17]:

A man traveling across a field encountered a tiger. He fled, the tiger after him. Coming to a precipice, he caught hold of the root of a wild vine and swung himself down over the edge. The tiger sniffed at him from above. Trembling, the man looked down to where, far below, another tiger was waiting to eat him. Only the vine sustained him.

Two mice, one white and one black, little by little started to gnaw away the vine. The man saw a luscious strawberry near him. Grasping the vine with one hand, he plucked the strawberry with the other. How sweet it tasted!

After telling this Zen parable to patients contemplating LVAD therapy or those who have already received an LVAD, the nurse can explain that their heart failure can represent the first tiger, with death representing the second. There is no escape from either. The vine is the LVAD, which serves to improve longevity and quality of life, so that the patients may continue to enjoy life's pleasures, or the strawberries. The vine is not curative, the tigers are still there, and at some point the mice will chew away at it. Just like the mice chewing on the vine, the nurse needs to explain that potential complications, worsening comorbidities, and decreased quality of life will occur at some point during LVAD therapy. When treating LVAD complications takes over the patient's life, the strawberries can no longer be enjoyed. The nurse needs to explain that it's imperative to have a plan for terminating the LVAD when the patient no longer enjoys the same quality of life, or strawberries that he or she used to. Members of the team need to know that plan so that the wishes of the patient and family are honored.

Patients with LVADs and their family members require significant emotional support from nurses as they experience feelings of confinement, fear of the unknown, and hope for the future.[11] Patients and their family members have increasing needs for emotional support at the end of life as hope for the future fades. They need to be reassured that comfort measures will be provided and that the patient's symptoms (for example, anxiety, dyspnea, chest pain) will be appropriately managed. Patients and their family members may also need and request spiritual support as they face end-of-life decisions. Spiritual care is a component of mental and social healthcare, and one of the oldest methods of alleviating suffering and promoting healing. Delgado provides a comprehensive guide for nurses to meet patients' spiritual needs.[18] However, critical care nurses may not have the time to implement all of these recommendations. At one facility, critical care nurses can ask if patients are affiliated with a religion, ask about their spiritual preferences and practices, and then ask how they can assist the patient and family with their spiritual needs. The authors of this article have included a basic guide to understanding religion-specific interventions of Buddism, Christianity, Hinduism, Islam, and Judaism.[19] If patients or family members ask a nurse to pray with them, Hubbartt and colleagues provide excellent resources for prayers to use with people of any faith, including prayers for Muslims, Jews, Christians, and Buddhists. For example, nurses can use a nondenominational prayer for comfort and meaning such as this one: “May today bring comfort and create peace. Help (patient's name) find meaning from this illness. We pray in the name of the one who created us, sustains us, and gives us meaning in our lives.” Another prayer nurses can use to calm and provide peace is: “Please provide (patient's name) what he/she needs today. Thy will be done.”[21]

Patient autonomy can be empowering

The ethical principle of autonomy empowers patients to request the withdrawal of life-sustaining treatments that are viewed by the patient as either ineffective or more troublesome than it's worth. This right includes the refusal of treatment that a patient consented to previously, even when withdrawal of treatment will result in death. Patient autonomy can be reinforced through the use of advance directives and decision makers who are appointed by the patient to help make healthcare choices when the patient can no longer do so. The withdrawal of LVAD support is a choice that is made based on the patient's assessment of quality of life, and is never meant as a means to terminate his or her life. It's important to remember that the cause of death after LVAD deactivation is heart failure, not physician-assisted suicide; therefore, patients receiving destination therapy have the right to withdraw LVAD support.[4]

Making a difference

As a critical care nurse, you know what it's like when a family member or patient who should've been prepared for death, and had time to be prepared, experiences death in fear and confusion, instead of dying peacefully. When the recommendations for proactive end-of-life care are implemented, we can make the inevitable into a time of healing and closure for the patient and their family.

Palliative medicine consultations for patients receiving destination therapy should be regarded as a routine and fundamental aspect of the care plan.5 End-of-life planning can not only help empower patients and give them more control over their healthcare, it also encourages them to formulate and effectively communicate their goals of care through the use of an advance directive, thereby providing for quality of death when quality of life is no longer possible.

What's an LVAD?1,8

LVAD implantation can provide mechanical circulatory support to the left ventricle and improve cardiac output in patients with end-stage heart failure. The device is surgically implanted through the abdomen. An inflow cannula is placed in the left ventricle and connects to the blood pump. As blood fills the left ventricle, it enters the pump via the inflow cannula and is then ejected from the pump through the outflow cannula to the ascending aorta, increasing the cardiac output. A percutaneous driveline extends from the pump through the abdominal wall and connects to a system controller and external energy source.

When an LVAD is needed [6,7]

The criteria for LVAD support include:

* a low cardiac output state despite the use of at least two inotropic agents and/or an intra-aortic balloon pump

* systolic BP <80 mm Hg

* pulmonary capillary wedge pressure >20 mm Hg

* cardiac index <2.0 L/minute/m ^{2}

* left ventricular ejection fraction <25%

* mixed venous saturation <60%

* rising serum creatinine in association with oliguria

* imminent end-organ failure.

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