Percutaneous removal of left ventricular assist device

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Left ventricular assist device (LVAD) is revolutionary in the treatment of advanced heart failure, representing a challenging and complex procedure in the management of patients with severe heart failure, providing significant improvements in quality of life and survival. For patients with end-stage heart failure, LVAD serves as a bridge-to heart transplantation.[1] While LVAD implantation is well-established, the process of its removal, especially through percutaneous techniques, is a new area of interest. After myocardial remission is confirmed, accompanied by satisfactory hemodynamic and echocardiographic findings, the LVAD is typically removed via median sternotomy, followed by complete removal of the pump housing, inflow cannula, and outflow graft, along with closure of the ventriculotomy site and aortic anastomosis. However, this approach requires repeat sternotomy, which poses additional risks, perioperative complications, and increases operative risk if another sternotomy is needed. The removal (decommissioning) of LVAD may be necessary for several reasons, such as heart transplantation, recovery of cardiac function, chronic LVAD-related infections that do not respond to conservative therapy, mechanical failure of the LVAD interfering with its proper function, and some thromboembolic complications. Alongside surgical explantation of the device, percutaneous removal techniques are becoming increasingly common, with transcatheter extraction and minimally invasive surgical techniques being the most frequent methods. The percutaneous removal technique has the advantage of avoiding repeated sternotomy, thereby simplifying any future cardiac surgical interventions.[2] Percutaneous transcatheter removal of LVAD is a complex procedure that involves a process of transcatheter extraction where nurses play a crucial role, significantly contributing to patient care and the success of the procedure. They are also key members of the multidisciplinary team, providing comprehensive care before, during, and after the procedure. Their influence extends across various aspects of the procedural process, including patient preparation, intraoperative assistance, and post-procedural monitoring.

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LITERATURE

1. Guglin M, Zucker MJ, Borlaug BA, Breen E, Cleveland J, Johnson MR, et al. Evaluation for Heart Transplantation and LVAD Implantation: JACC Council Perspectives. J Am Coll Cardiol. 2020 Mar 31;75(12):1471-1487. https://doi.org/10.1016/j.jacc.2020.01.034
2. Gerhard EF, Wang L, Singh R, Schueler S, Genovese LD, Woods A, et al. LVAD decommissioning for myocardial recovery: Long-term ventricular remodeling and adverse events. J Heart Lung Transplant. 2021 Dec;40(12):1560-1570. https://doi.org/10.1016/j.healun.2021.08.001