

Does PTFE coverage facilitate LVAD explant and heart transplant?

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Left ventricular assist device (LVAD) explantation followed by heart transplantation (HT) is a physically demanding and traumatic procedure. Implantable LVADs cause inflammation to which the body reacts with dense vascular adhesions and tissue infiltration into the many interstices of the device. The primary areas of concern during explant include (1) right ventricle or outflow graft injury during re-sternotomy, (2) the outflow graft hindering access to the IVC, SVC, and aorta for cannulation, (3) tissue ingrowth to the LVAD, and (4) injury specifically to the diaphragm/lung/phrenic nerve on removal, and muscular bleeding with the removal of the dacron coated driveline.

Explanation can be made safer and easier by careful preparation during the implant. Placing the outflow graft away from the midline and laterally around the right atrium will mitigate re-sternotomy injury. Keeping the LVAD within the pericardial space decrease lung and phrenic nerve injury. Avoiding the use of glues and adhesives makes adhesions more manageable.

Another important adjunct is the use of PTFE. It is important to use material with the lowest porosity (Gortex Preclude, W.L. Gore) to minimize tissue ingrowth and act as a protective membrane. Our practice, similar to the authors, is to cover the anterior surface of the heart by sewing a non-wrinkled piece of ePTFE to the pericardial edges. This facilitates re-sternotomy.

In this paper,¹ the authors compare the use of minimal PTFE (mPTFE—anterior mediastinum only) or no PTFE to a technique described as total coverage (tPTFE—mPTFE plus coverage around the device, outflow graft, and great vessels). This was not a randomized trial and the LVADs used in the two groups are different. The mPTFE group was primarily HMII and HM3 and the tPTFE group was primarily HVAD. HM3, the only currently available LVAD, made up a

minimal number of implants. Objectively, there was no difference between groups regarding entry to CPB time, injury to mediastinal structures, closure/hemostasis time, and post-transplant outcomes. The authors surveyed four cardiac surgeons who performed the procedures. They found a preference for tPTFE with regard to less perception of bleeding and more ease/predictability of explant.

Unfortunately, the paper does not provide a definitive objective answer regarding the difference between no PTFE, mPTFE, or tPTFE. Use of PTFE does appear safe, although mediastinitis might necessitate removal of all the PTFE which would be difficult with the total technique. Preparation for LVAD explant remains institutional preference. We will continue to use PTFE to protect the anterior surface of the heart, cover a portion of the driveline to facilitate removal and in targeted areas around the IVC, SVC, and aorta to make cannulation safer and easier.

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