

10) Understanding Factors Contributing to Increased Length of Stay Following Left Ventricular Assist Device Implantation

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PROJECT DESCRIPTION

Introduction: With the increased use of continuous flow Left Ventricular Assist Devices (LVADs) in patients with stage D heart failure, resource utilization including length of stay (LOS) associated with this surgical therapy has become increasingly important to hospitals, third party payers and patients. We evaluated reasons for delayed discharge following LVAD implantation.

Methods: We prospectively monitored consecutive admissions for LVAD implant at our hospital from September 2013 to December 2014 and recorded reasons for delay in discharge over our target LOS of 14 days following surgery. Patients that died prior to discharge were excluded, as well as one patient who received two LVADs during one admission and another patient with ESRD who was dialysis-dependent prior to surgery. Contributing factors to delayed discharge were then categorized. In our population, predominant categories were post-op bleeding (requiring return to the OR), right ventricular (RV) failure (mechanical or inotropic RV support >7 full days), and sub-therapeutic INR (<2.0 on post-op day 14). We also included a nonmedical category for issues surrounding insufficient social support, insurance approval for medication/rehab, and device education/training. Multivariate linear regression modeling was performed to identify determinants of LOS adjusted for baseline characteristics. Model covariates were selected based on clinical relevance and frequency of occurrence in our population.

Results: During the study period, 55 LVAD surgeries met inclusion/exclusion criteria for the analysis. Median age was 58 years (IQR 45-66); 85% male; 36% ischemic etiology; 69% HeartWare HVAD, 31% HeartMate II; 27% underwent LVAD exchange and 62% had LVAD placed as bridge-to-transplantation (BTT). Median LOS post-VAD was 15 days (IQR 13-19); and median ICU LOS post-VAD was 3 days (IQR 2-5). Twenty-five patients (45%) met our post-implant target LOS of ≤ 14 days. Predominant medical reasons for delayed discharge included: RV failure, sub-therapeutic INR, and bleeding requiring OR re-exploration. Nonmedical reasons accounted for 15% of discharge delays. The final linear regression model for LOS prediction contained age, gender, ischemic etiology, LVAD exchange, INR, nonmedical factors and RV failure. Following multivariable adjustment, RV failure (parameter estimate 4.9, $p=0.006$) was an independent predictor of LOS.

Conclusions: In our experience, median post LVAD LOS was 15 days with 45% of patients being discharged at 14 days or less. The majority of patients had medical reasons for delayed discharge and only 15% of patients had delayed discharge due to nonmedical concerns. Based on our definitions, RV failure following LVAD surgery was found to be an important predictor of post-implant LOS.

OUTCOMES ACHIEVED

- Median post LVAD LOS at our institution during the study period was 15 days with 45% of patients being discharged at 14 days or less

LESSONS LEARNED

- Most patients had medical reasons for delayed discharge and only 15% of patients had delayed discharge due to nonmedical concerns.
- RV failure following LVAD surgery is an independent predictor of post-implant LOS
- There are many opportunities to optimize care delivery improving quality, and overall efficiency of care delivered.