

Risk Factors for Mortality Following Heart Transplantation in Obese Patients Bridged with an LVAD

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INTRODUCTION

Heart transplantation (HT) is relatively contraindicated in morbidly obese patients due to increased morbidity and mortality. With improving outcomes of left ventricular assist devices (LVADs), it is unclear which obese patients on LVAD support should undergo HT.

Currently, there is little published data on outcomes for HT among obese patients on LVAD support and limited guidelines for appropriate patient selection.

The aim of this study was to identify risk factors for post-HT mortality in obese patients with LVADs.

METHODS

The United Network for Organ Sharing database was used to identify patients with body mass index (BMI) ≥ 35 kg/m² who were on durable LVAD at the time of isolated HT between 2010 and 2021.

The primary outcome was post-HT 1-year mortality.

Multivariable Cox regression modeling was used to identify significant risk factors for 1-year mortality. Receiver-operating-characteristic (ROC) analyses were performed to identify optimal thresholds for continuous variables associated with the primary outcome. Patients were stratified by number of risk factors and Kaplan-Meier analysis was used to compare survival among these cohorts.

STUDY COHORT

27,752 patients isolated HT in the study period

- 2120 (7.6%) had BMI ≥ 35 kg/m²
- 1222 (57.6%) of those with BMI ≥ 35 kg/m² were bridged with a durable LVAD

RESULTS

6 risk factors were identified as significantly associated with 1-year post-HT mortality:

- Recipient age >62.5 years
- BMI >36.6 kg/m²
- Bilirubin >0.95 mg/dL
- Cold ischemic time >3.7 hours
- Recipient-Donor Sex Mismatch
- Pre-transplant mechanical ventilation

Risk factors	HR (confidence interval)	p value
Body mass index (BMI), kg/m ²	1.10 (1.102-1.19)	p=0.014
Recipient age, years	1.02 (1.00-1.04)	p=0.024
Total bilirubin, mg/dl	1.18 (1.12-1.25)	p<0.001
Pre-transplant mechanical ventilation	7.58 (3.54-16.23)	p<0.001
Cold ischemic time, hours	1.17 (1.03-1.33)	p=0.018
Recipient-donor sex mismatch	0.57 (0.37-0.88)	p=0.011

Table: Multivariable models with significant risk factors impacting on post-transplant 1-year mortality.

Patients were then stratified based on the number of risk factors:

- 105 (8.6%) with 0 risk factors
- 374 (30.6%) with 1 risk factor
- 452 (37.0%) with 2 risk factors
- 291 (23.8%) with 3 or more risk factors

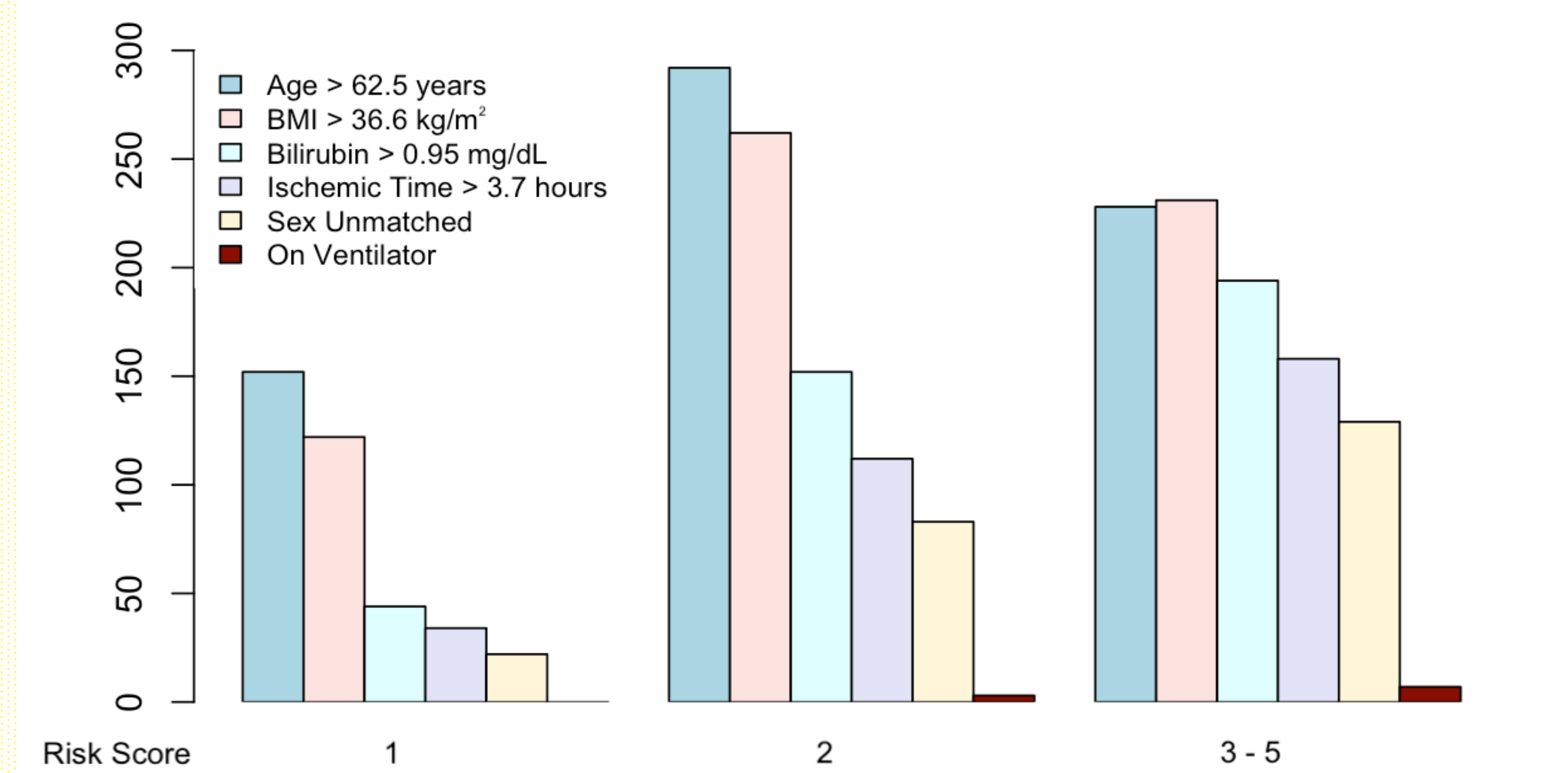


Figure: Distribution of risk factors among patients in stratified risk score groups.

Primary Outcome: One-Year Survival

Post-HT 1-year survival decreased significantly as number of risk factors increased:

- 96.0% for 0 risk factors
- 93.1% for 1 risk factor
- 87.2% for 2 risk factors
- 77.6% for 3 or more risk factors

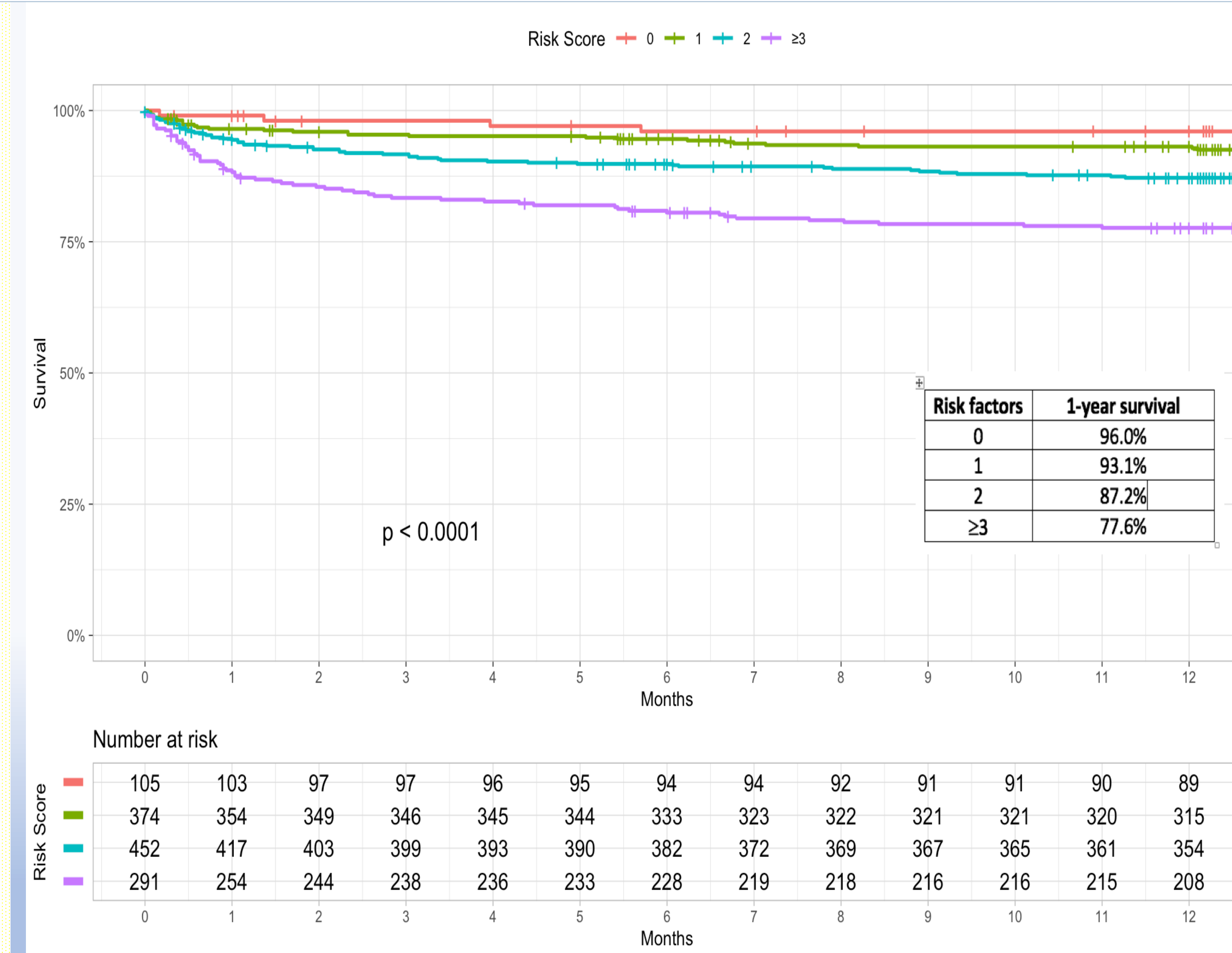


Figure: Kaplan-Meier analysis comparing 1-year post-HT survival based on number of risk factors in obese patients being bridged with LVADs.

CONCLUSIONS

These data provide a useful guide for risk stratification and patient selection in obese LVAD candidates being considered for HT.

Further research is needed to delineate whether any survival benefit is achieved with HT compared to remaining on LVAD support for those with 3 or more risk factors.