

Heart Transplant Outcomes in Re-do Heart Transplants vs Bridge to Heart Transplant with HeartMate 3 Left Ventricular Assist Device in the Modern Era

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INTRODUCTION

- The HeartMate 3(HM3) durable LVAD has shown improved survival out to 5 years
- The improved survival raises questions about the overall lifetime surgical management of advanced heart failure
- This study aims to assess post-heart transplant outcomes in patients who were bridged with HM3 devices vs those who had a re-do HT in the current allocation era

METHOD

- All adult (≥ 18 years) isolated heart transplants between October 18, 2018 and June 2025 were identified from UNOS database
- Inclusion criteria: (1) Pre-existing HM3 or (2) Prior-Heart transplant
- Exclusion criteria: (1) prior HT or HM3 occurred ≤90 days before index HT or (2) >1 prior HT
- Primary outcome: survival at 30 days, 1 year, 3 years, and 5 years
- Secondary outcome: acute rejection, acute renal failure, pacemaker implant, stroke, and hospital length of stay (LOS)
- Univariable and multivariable cox regression models were performed for risk adjustment

RESULTS

Table1. Baseline characteristics

Variable	Re-do HT	HM3	P value
N	384	2527	
Time with prior HT or HM3 (years)	12.68(8.35)	1.94 (1.46)	0.0001
Age	42.60 (15.31)	54.22 (11.61)	0.0001
Male	240 (62.50)	1967 (77.84)	<0.0001
Race			<0.0001
White	235 (61.20)	1474 (58.33)	
Black	64 (16.67)	705 (27.90)	
Hispanic	64 (16.67)	240 (9.50)	
Other	21 (5.47)	108 (4.27)	
BMI	27.38 (5.02)	29.59 (4.97)	0.0001
Diabetes	111 (28.91)	885 (35.02)	0.019
Mechanical Ventilator	8 (2.08)	5 (0.20)	<0.0001
Inotropes	102 (26.56)	213 (8.43)	<0.0001
Pre-op dialysis	17 (4.43)	43 (1.70)	<0.0001
Creatinine	1.46 (0.72)	1.28 (0.57)	0.0001
Total Bilirubin	0.80 (0.75)	0.70 (.52)	0.0252
ABO group			0.242
AB	22 (5.77)	113 (4.49)	
A	153 (40.16)	996 (39.54)	
B	66 (17.32)	373 (14.81)	
O	140 (36.75)	1037 (41.17)	
Days on Waitlist	48.5 (17, 158)	132 (30, 425)	0.0001
Listing Status			<0.0001
Status 1	41 (10.68)	135 (5.34)	
Status 2	163 (42.45)	493 (19.51)	
Status 3	47 (12.24)	993 (39.30)	
Status 4	133 (34.64)	906 (35.85)	
Donor Characteristics			
Age	31.18 (10.60)	34.57 (10.55)	0.0001
Male	243 (63.28)	1841 (72.85)	<0.0001
Race			0.223
White	256 (67.02)	1676 (66.93)	
Black	46 (12.04)	384 (15.34)	
Hispanic	71 (18.59)	389 (15.54)	
Other	9 (2.36)	55 (2.20)	
Donor Cause of Death			0.06
Trauma	148 (38.54)	842 (33.32)	
Drug Overdose	101 (26.30)	713 (28.22)	
Stroke	48 (12.50)	393 (15.55)	
Anoxia	34 (8.85)	157 (6.21)	
Cardiovascular	46 (11.98)	375 (14.84)	
Other	7 (1.82)	47 (1.86)	
BMI	27.00 (6.09)	28.82 (6.72)	0.0001
DCD donors	46 (11.98)	366 (14.48)	0.19
Hep C donors	36 (9.38)	344 (13.62)	0.021
Ischemic Time	3.65 (1.34)	3.89 (1.61)	0.0201
Distance	228.5 (90.5)	218 (94, 411)	0.9273
ABO identicle	322 (83.85)	2322 (91.89)	<0.0001
Sex Match	291 (75.78)	2085 (82.51)	0.002
PHM ratio	1.02 (0.16)	0.99 (0.15)	0.0001

Figure 1. Kaplan-Meier survival out to 5 years in re-do HT vs HM3 explant

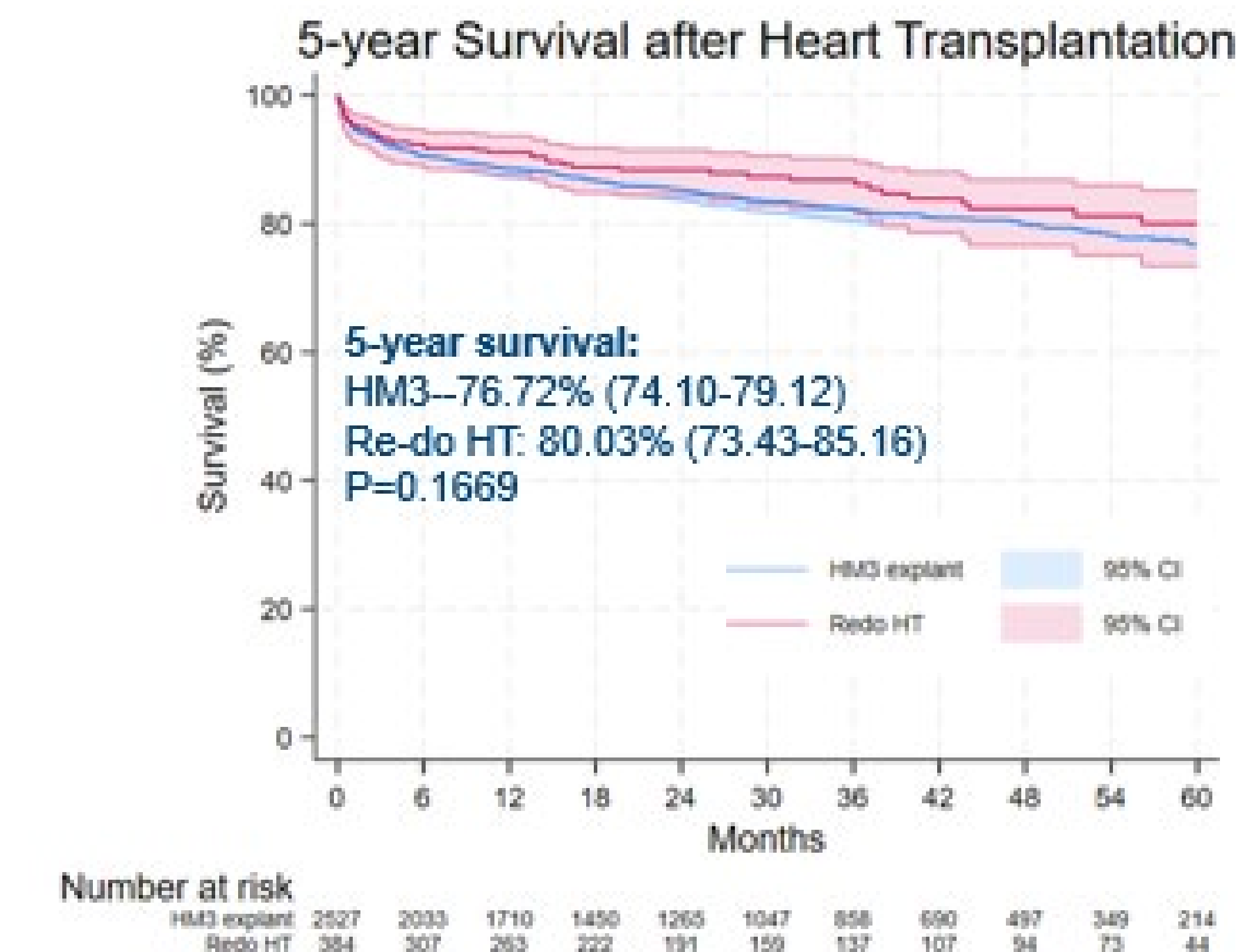


Table 2. Multivariable-risk adjustment for 1-year mortality

Variable	Multivariable Results	
	HR (95% CI)	P value
Transplant type		
VAD explant	Reference	
Re-do	0.82 (0.55-1.23)	0.341
Age	1.32 (1.19-1.48)	<0.0001
Gender		
Male	Reference	
Female	1.69 (1.28-2.23)	<0.0001
Race		
White	Reference	
Black	1.16 (0.89-1.52)	0.261
Hispanic	1.30 (0.90-1.89)	0.164
Other	1.27 (0.73-2.20)	0.4
BMI	1.20 (0.92-1.57)	0.17
Diabetes	1.27 (1.00-1.61)	0.041
Pre-op Inotropes	1.70 (1.25-1.79)	<0.0001
Pre-op Dialysis	0.70 (0.33-1.47)	0.344
Creatinine	1.50 (1.26-1.79)	<0.0001
Total Bilirubin	1.29 (1.10-1.51)	0.002
Donor Age	1.09 (0.98-1.21)	0.132
Donor Race		
White	Reference	
Black	1.27 (0.94-1.73)	0.125
Hispanic	1.08 (0.79-1.49)	0.613
Other	1.02 (0.45-2.30)	0.97
Donor BMI	0.79 (0.63-0.98)	0.034
Ischemic time	1.07 (1.00-1.15)	0.049
PHM ratio	0.79 (0.29-2.11)	0.634
*Variables selected for multivariable analysis if p value was <0.2 in univariable analysis or if suspected clinical significance.		
**Full list of variables from table 1 were included in the original univariable analysis		

RESULTS

Table 3: Secondary outcomes for Re-do HT vs HM3 explant

Variable	Re-do HT	HM3	P value
Renal Failure-N%	84 (21.88)	448 (17.78)	0.054
Stroke-N%	19 (4.96)	117 (4.65)	0.791
Pacemaker-N%	3 (0.78)	46 (1.83)	0.094
Rejection-%	55 (14.32)	407 (16.13)	0.368
LOS- median (IQR)	17 (12, 26)	18 (13, 28)	0.0422

CONCLUSIONS

- Post-HT survival between redo HT and patients bridged to HT with HM3 is similar out to 5 years with equivalent morbidity outcomes
- This is a key consideration when determining the appropriate pathway for lifetime surgical management of advanced heart failure
- Further research is required to inform the appropriate selection for initial operation (ie. Primary HT vs HM3 implant)

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DISCLOSURES

Arman Kilic is a speaker and consultant for Abiomed, Abbott, 3ive, and LivaNova. Additionally, A.K. is the founder and owner of QImetrix. All additional authors have no financial relationships to disclose.