

SUPPLEMENTAL MATERIAL

Table S1. Baseline haemodynamic and echocardiographic characteristics

Haemodynamic characteristics				
Mean pulmonary arterial pressure, mmHg mean (SD)	55.8 (24.0)	48.1 (21.3)	71.7 (21.8)	0.001
Mean aortic pressure, mmHg mean (SD)	63.1 (10.3)	63.4 (8.5)	62.6 (13.6)	0.80
Right arterial pressure, mmHg median [IQR]	7.0 [5.0, 8.0]	6.0 [5.0, 8.0]	8.0 [7.3, 13.0]	0.017
Left atrial pressure, mmHg median [IQR]	8.0 [7.0, 10.0]	8.0 [6.0, 9.0]	8.5 [7.0, 11.0]	0.44
Pulmonary artery oxygen saturation, % median [IQR]	69.5 [64.3, 75.6]	73.0 [67.0, 82.0]	65.0 [57.0, 71.0]	0.019
PVRI baseline, WUxm2 median [IQR]	13.6 [9.3, 25.6]	11.8 [6.5, 22.1]	24.2 [13.5, 27.4]	0.01
PVRI with oxygen, WUxm2 median [IQR]	18.0 (12.3)	18.0 (12.3)	18.0 (14.1)	1.00
PVRI with nitric oxide, WUxm2 median [IQR]	12.0 [5.9, 19.5]	10.3 [5.0, 15.2]	15.8 [12.1, 26.2]	0.03
Echocardiographic characteristics				
<i>Right heart dimensions:</i>				
Right atrial area, cm ² median[IQR]	12.83 [9.75, 15.69]	11.75 [9.28, 13.39]	15.90 [11.10, 19.20]	0.008
Right atrial z-score, median [IQR]	2.92 [1.25, 5.11]	1.77 [1.03, 3.21]	5.31 [3.30, 7.21]	<0.001
Tricuspid valve diameter, cm mean (SD)	2.75 (0.75)	2.66 (0.68)	2.95 (0.88)	0.15
Tricuspid valve diameter, z-score median [IQR]	2.78 [0.76, 5.23]	2.04 [0.32, 4.25]	4.56 [2.31, 5.65]	0.035
RV inflow diastolic diameter, cm median [IQR]	2.60 [1.85, 3.53]	2.44 [1.60, 2.85]	2.90 [2.28, 4.35]	0.09
RV inflow systolic diameter, cm median [IQR]	2.40 [1.76, 3.70]	2.20 [1.40, 2.60]	3.45 [2.21, 4.48]	0.036
Pulmonary valve diameter, cm mean (SD)	2.15 (0.61)	2.07 (0.61)	2.31 (0.61)	0.16
Pulmonary valve diameter, z-score mean (SD)	2.28 (2.66)	1.72 (2.78)	3.24 (2.17)	0.04
Right pulmonary artery dimension, cm mean (SD)	1.44 (0.51)	1.39 (0.52)	1.53 (0.48)	0.33
Right pulmonary artery dimension, z-score mean (SD)	1.72 (2.33)	1.42 (2.47)	2.24 (2.02)	0.20
Left pulmonary artery dimension, cm mean (SD)	1.45 [1.12, 1.97]	1.44 [1.10, 1.95]	1.50 [1.20, 2.00]	0.56
Left pulmonary artery dimension, z-score mean (SD)	2.21 [1.02, 4.92]	2.21 [0.56, 4.56]	2.21 [1.11, 5.25]	0.37
<i>Right ventricular function:</i>				

Semiquantitative RV function, I-IV median [IQR]	2.00 [1.00, 2.50]	1.25 [1.00, 2.00]	2.50 [2.00, 3.00]	<0.001
Tricuspid annular plane systolic excursion, cm mean (SD)	1.59 (0.42)	1.66 (0.45)	1.47 (0.34)	0.10
Tricuspid annular plane systolic excursion, z-score mean (SD)	-2.77 (2.40)	-2.36 (2.52)	-3.56 (1.95)	0.07
RV dp.dt, median [IQR]	1143 [964, 1620]	1131 [966, 1403]	1236 [924, 1629]	0.75
RV shortening fraction, % mean (SD)	39.5 (12.2)	38.1 (11.7)	42.3 (13.0)	0.21
<i>PHT severity parameters:</i>				
Tricuspid regurgitation Doppler velocity, m/s mean (SD)	4.27 (0.92)	3.99 (0.85)	4.79 (0.82)	0.001
Pulmonary acceleration time, ms median [IQR]	67.0 [51.0, 83.0]	75.8 [59.5, 98.5]	50.0 [47.0, 73.5]	0.008
<i>Left heart dimensions:</i>				
Left atrial area, cm ² median[IQR]	8.08 (3.48)	8.09 (3.45)	8.07 (3.62)	0.98
Left atrial z-score, median [IQR]	-1.01 [-1.81, 0.55]	-1.02 [-1.75, 0.35]	-0.89 [-2.00, 0.76]	0.90
Mitral valve diameter, cm mean (SD)	1.98 (0.55)	2.04 (0.56)	1.84 (0.51)	0.19
Mitral valve diameter, z-score median [IQR]	-2.36 (2.46)	-2.18 (2.62)	-2.73 (2.09)	0.42
LV inflow diastolic diameter, cm median [IQR]	31.72 (8.86)	34.07 (8.38)	27.26 (8.16)	0.004
LV inflow systolic diameter, cm median [IQR]	19.24 (6.63)	20.83 (5.63)	16.21 (7.45)	0.01
Aortic valve diameter, cm mean (SD)	1.48 (0.38)	1.47 (0.38)	1.50 (0.40)	0.75
Aortic valve diameter, z-score mean (SD)	-1.92 (1.23)	-1.97 (1.33)	-1.81 (1.02)	0.64
<i>Left ventricular function:</i>				
Ejection fraction, % mean (SD)	69.6 (14.8)	67.8 (14.1)	73.2 (16.0)	0.19
<i>Left ventricular eccentricity indices:</i>				
Systolic LV eccentricity index, median [IQR]	1.9 [1.5, 2.5]	1.70 [1.5, 2.2]	2.4 [1.7, 3.4]	0.014
Diastolic LV eccentricity index, median [IQR]	1.5 [1.3, 1.8]	1.3 [1.2, 1.6]	1.8 [1.4, 2.0]	0.001
<i>Tissue Dopple characteristics</i>				
Tricuspid valve S-wave, m/s mean (SD)	0.11 (0.02)	0.11 (0.02)	0.10 (0.03)	0.29

Tricuspid valve E-wave, m/s mean (SD)	0.12 (0.04)	0.13 (0.04)	0.11 (0.05)	0.15
Tricuspid valve A-wave, m/s mean (SD)	0.11 (0.03)	0.11 (0.03)	0.11 (0.02)	0.75
Interventricular septum S-wave, m/s median [IQR]	0.06 [0.05, 0.07]	0.06 [0.05, 0.07]	0.06 [0.04, 0.07]	0.12
Interventricular septum E-wave, m/s median [IQR]	0.07 [0.06, 0.10]	0.08 [0.06, 0.10]	0.06 [0.04, 0.08]	0.02
Interventricular septum A-wave, m/s median [IQR]	0.06 [0.05, 0.07]	0.06 [0.05, 0.06]	0.06 [0.05, 0.07]	0.70
Mitral valve S-wave, m/s mean (SD)	0.06 [0.05, 0.08]	0.06 [0.06, 0.08]	0.06 [0.05, 0.07]	0.06
Mitral valve E-wave, m/s mean (SD)	0.11 (0.04)	0.12 (0.04)	0.09 (0.05)	0.01
Mitral valve A-wave, m/s mean (SD)	0.05 [0.05, 0.07]	0.05 [0.05, 0.06]	0.06 [0.04, 0.08]	0.34

LV=left ventricle, PHT=pulmonary hypertension, PVRI=pulmonary vascular resistance index, RV=right ventricle. *P*-values refer to comparisons between patients with and without transplant-free survival.

Table S2. Robustness of parameters on univariate Cox analysis to random selection and random replacement:

Parameter	Significance of 80% random sample	Significance of random sampling with replacement
RA area (z-score)	1000	1000
LV eccentricity index diastolic	999	999
RA area (cm ²)	998	998
RV inflow diameter systolic (cm)	945	743
RV semiquant function (>2)	919	1000
LV eccentricity index systolic	902	939
LV eccentricity index diastolic (norm)	871	886
TV velocity (m/s)	789	885
E-wave lat. MV (mm/s)	754	840
LV inflow diameter diastolic (cm)	712	805
LV eccentricity index systolic (norm)	701	761
LV inflow diameter systolic (cm)	678	798
RV inflow diameter diastolic (cm)	599	663
A-wave lat. MV (mm/s)	495	514
TV diameter (z-score)	438	440
TV diameter (cm)	406	487
Pulmonary valve diameter (z-score)	381	485
PA acceleration time (ms)	282	417

Illustration of the robustness of the significant association between various parameters and transplant-free survival on univariate Cox analysis. Random samples were taken from the dataset and the analysis was repeated 1,000 times. The numbers show how frequent (out of 1,000 maximum) the parameter in question remain significant. For details we refer to the Methods and Results section of the manuscript.

LV = left ventricular, PA = pulmonary artery, RA = right atrial, RV = right ventricular.