

Table S1 PS-matched groups: characteristics and outcomes

Variables	NYHA class III/IV (n=69)	NYHA class I/II (n=69)	P value	SMD
Age (years)	43.00 [33.00, 55.00]	42.00 [30.00, 54.00]	0.777	0.038
Gender, male	31 (44.9)	31 (44.9)	1.000	0
BMI (kg/m <sup>2</sup> )	22.13 [19.47, 23.89]	22.49 [20.57, 24.68]	0.204	0.097
Hypertension	6 (8.7)	5 (7.2)	1.000	0.054
Diabetes	1 (1.4)	1 (1.4)	1.000	0
AF	37 (53.6)	39 (56.5)	0.864	0.058
Lung disease	1 (1.4)	1 (1.4)	1.000	0
Stroke	0 (0)	0 (0)	1.000	0
Hepatitis C	1 (1.4)	1 (1.4)	1.000	0
Functional	17 (24.6)	14 (20.3)	0.683	0.104
Rheumatic	37 (53.6)	27 (39.1)	0.124	0.294
Ebstein's anomaly	7 (10.1)	8 (11.6)	1.000	0.047
Previous valve surgery	36 (52.2)	32 (46.4)	0.609	0.116
MVR	19 (27.5)	12 (17.4)	0.221	0.245
MVP	1 (1.4)	1 (1.4)	1	0
AVR	2 (2.9)	6 (8.7)	0.274	0.25
TVR	3 (4.3)	9 (13.0)	0.131	0.312
TVP	12 (17.4)	4 (5.8)	0.063	0.368
Second time or more	8 (11.6)	5 (7.2)	0.56	0.149
NYHA			<0.001	11.696
I	0 (0.0)	1 (1.4)		
II	0 (0.0)	68 (98.6)		
III	53 (76.8)	0 (0.0)		
IV	16 (23.2)	0 (0.0)		
Hemoglobin	131.0 [118.5, 145.5]	137.0 [121.5, 148.5]	0.317	0.187
WBC (×10 <sup>9</sup> /L)	5.38 [4.40, 6.60]	5.60 [4.27, 6.85]	0.669	0.135
PLT (×10 <sup>9</sup> /L)	150.0 [117.0, 203.5]	159.0 [120.5, 207.5]	0.599	0.065
BUN (mmol/L)	6.50 [5.25, 7.83]	5.75 [4.50, 6.68]	0.009	0.473
AST (U/L)	28.00 [24.00, 35.00]	23.50 [20.75, 30.25]	0.003	0.426
ALT (U/L)	22.0 [16.0, 31.0]	22.0 [16.0, 38.0]	0.973	0.126
TBil (μmol/L)	27.30 [18.80, 34.58]	23.70 [15.45, 27.30]	0.03	0.401
Hypoproteinemia	6 (10.2)	10 (17.5)	0.378	0.215
EF (%)	63.0 [57.0, 68.0]	63.0 [57.0, 68.0]	0.821	0.028
Liver enlargements	9 (13.0)	5 (7.2)	0.398	0.193
Spleen enlargement	8 (11.6)	6 (8.7)	0.778	0.096
Ascites	0 (0.0)	1 (1.4)	1.000	0.171
Lower extremity edema	27 (39.1)	14 (20.3)	0.025	0.421
Isolated TVR	30 (43.5)	32 (46.4)	0.864	0.058
CPB time (minutes)	130.0 [101.0, 176.0]	116.0 [91.0, 155.0]	0.077	0.313
ACC	62 (89.9)	54 (78.3)	0.104	0.321
ACC time (minutes)	81.0 [53.0, 111.0]	67.0 [36.0, 99.0]	0.166	0.256
Mechanical valve	31 (44.9)	27 (39.1)	0.605	0.118
Reoperation	7 (10.1)	5 (7.2)	0.763	0.103
Reintubation	7 (10.1)	4 (5.8)	0.530	0.161
Tracheostomy	4 (5.8)	5 (7.2)	1.000	0.059
ICU time (hours)	38.0 [21.0, 73.0]	24.0 [18.0, 60.0]	0.062	0.098
Mechanical ventilation (hours)	20.0 [18.0, 42.0]	18.0 [14.0, 31.0]	0.020	0.08
Bleeding	9 (13.0)	2 (2.9)	0.059	0.381
Low cardiac output	13 (18.8)	9 (13.0)	0.485	0.159
Liver failure	2 (2.9)	1 (1.4)	1.000	0.100
Perioperative stroke	1 (1.4)	0 (0.0)	1.000	0.171
Gastrointestinal bleeding	3 (4.3)	6 (8.7)	0.490	0.177
Lower limb ischemia	0 (0)	0 (0)	1.000	0
Renal failure	10 (14.5)	2 (2.9)	0.034	0.420
IABP	0 (0)	0 (0)	1.000	0
ECMO	0 (0.0)	3 (4.3)	0.243	0.302
CRRT	3 (4.3)	4 (5.8)	1.000	0.066
In hospital mortality (%)	10 (14.5)	5 (7.2)	0.274	0.234
Follow up (months)	66.0 [9.0, 134.0]	65.0 [14.0, 104.0]	0.397	0.216
Overall mortality (%)	20 (29.0)	10 (14.5)	0.063	0.357

Values are expressed as median with interquartile range or number (percentage). NYHA, New York Heart Association; SMD, standardized mean difference; BMI, body mass index; AF, atrial fibrillation; MVR, mitral valve replacement; MVP, mitral valvuloplasty; AVR, aortic valve replacement; TVR, tricuspid valve replacement; TVP, tricuspid valvuloplasty; WBC, white blood cell; PLT, platelet; TBil, total bilirubin; EF, ejection fraction; CPB, cardiopulmonary bypass; ACC, aortic cross clamp; ICU, intensive care unit; IABP, intra-aortic balloon pump; ECMO, extracorporeal membrane oxygenation; CRRT, continuous renal replacement therapy.

**Table S2** Overlap PS-weighted groups: characteristics and outcomes

Variables	NYHA class III/IV (n=69)	NYHA class I/II (n=69)	P value	SMD
Age (years)	43.00 [33.00, 55.00]	42.00 [31.16, 53.78]	0.910	<0.001
Gender, male	24.3 (52.2)	24.3 (52.2)	1.000	0
BMI (kg/m <sup>2</sup> )	21.88 [19.63, 24.13]	22.22 [20.29, 24.36]	0.438	<0.001
Hypertension	3.9 (8.3)	3.9 (8.3)	1.000	0
Diabetes	1.1 (2.4)	1.1 (2.4)	1.000	0
AF	27.4 (58.8)	27.4 (58.8)	1.000	0
Lung disease	0.6 (1.3)	0.6 (1.3)	1.000	0
Stroke	0.0 (0.0)	0.0 (0.0)	0.046	0
Hepatitis C	0.8 (1.6)	0.8 (1.6)	1.000	0
Functional	10.7 (22.9)	10.7 (22.9)	1.000	0
Rheumatic	24.2 (52.0)	19.4 (41.7)	0.169	0.208
Ebstein's anomaly	4.7 (10.1)	4.7 (10.1)	1.000	0
Previous valve surgery	22.2 (47.7)	22.2 (47.7)	1.000	0
MVR	10.9 (23.5)	8.9 (19.1)	0.470	0.108
MVP	0.2 (0.4)	0.5 (1.0)	0.359	0.082
AVR	2.4 (5.2)	4.6 (9.8)	0.179	0.176
TVR	2.8 (6.0)	5.4 (11.5)	0.186	0.195
TVP	7.0 (14.9)	2.4 (5.1)	0.031	0.331
Second time or more	4.3 (9.1)	3.4 (7.3)	0.665	0.066
NYHA			<0.001	12.563
I	0.0 (0.0)	0.6 (1.3)		
II	0.0 (0.0)	46.0 (98.7)		
III	37.7 (80.9)	0.0 (0.0)		
IV	8.9 (19.1)	0.0 (0.0)		
Hemoglobin	130.00 [116.00, 146.00]	133.95 [118.68, 144.00]	0.605	0.090
WBC (×10 <sup>9</sup> /L)	5.34 [4.47, 6.60]	5.39 [4.22, 6.65]	0.817	0.188
PLT (×10 <sup>9</sup> /L)	156.78 [113.00, 209.00]	159.00 [113.76, 214.67]	0.982	0.054
BUN (mmol/L)	6.40 [5.20, 8.20]	6.03 [4.48, 6.80]	0.005	0.378
AST (U/L)	29.0 [24.0, 35.0]	24.0 [20.0, 30.0]	<0.001	0.43
ALT (U/L)	21.17 [16.00, 30.00]	22.00 [16.00, 33.63]	0.695	0.101
TBil (μmol/L)	27.30 [18.17, 33.20]	23.61 [14.11, 27.30]	0.008	0.438
Hypoproteinemia	5.3 (13.4)	6.4 (17.2)	0.499	0.107
EF (%)	63.0 [57.0, 68.0]	63.0 [57.0, 67.0]	0.855	<0.001
Liver enlargements	9.1 (19.6)	3.3 (7.1)	0.021	0.373
Spleen enlargement	7.9 (16.9)	4.1 (8.7)	0.114	0.245
Ascites	1.0 (2.1)	0.9 (1.9)	0.909	0.017
Lower extremity edema	16.8 (36.1)	9.7 (20.7)	0.026	0.345
Isolated TVR	20.6 (44.2)	20.6 (44.2)	1.000	0
CPB time (minutes)	125.00 [97.55, 172.00]	115.44 [91.51, 147.00]	0.114	0.262
ACC	40.6 (87.1)	37.2 (79.8)	0.152	0.196
ACC time (minutes)	75.72 [47.72, 103.31]	65.77 [38.18, 96.58]	0.175	0.221
Mechanical valve	21.6 (46.4)	16.7 (35.9)	0.153	0.213
Reoperation	4.7 (10.0)	3.3 (7.1)	0.484	0.105
Reintubation	5.2 (11.2)	2.4 (5.2)	0.148	0.221
Tracheostomy	2.4 (5.1)	4.0 (8.5)	0.317	0.137
ICU time (hours)	41.71 [20.00, 77.43]	27.20 [17.00, 61.83]	0.022	0.074
Mechanical ventilation (hours)	21.00 [17.00, 44.84]	18.00 [14.00, 33.03]	0.002	0.018
Bleeding	4.3 (9.2)	1.7 (3.7)	0.144	0.227
Low cardiac output	10.9 (23.3)	6.9 (14.7)	0.159	0.220
Liver failure	1.7 (3.7)	0.8 (1.8)	0.532	0.113
Perioperative stroke	0.3 (0.7)	0.0 (0.0)	0.165	0.120
Gastrointestinal bleeding	3.2 (6.9)	4.1 (8.8)	0.622	0.072
Lower limb ischemia	0.6 (1.2)	0.0 (0.0)	0.233	0.158
Renal failure	7.2 (15.5)	1.2 (2.6)	0.006	0.460
IABP	0.6 (1.3)	0.0 (0.0)	0.100	0.165
ECMO	0.7 (1.4)	2.3 (5.0)	0.096	0.201
CRRT	3.1 (6.6)	2.8 (6.1)	0.887	0.022
In hospital mortality (%)	8.0 (17.2)	3.4 (7.4)	0.072	0.302
Follow-up (months)	65.00 [7.75, 128.78]	66.06 [22.22, 108.17]	0.729	0.137
Overall mortality (%)	15.2 (32.7)	7.0 (15.0)	0.009	0.424

Values are expressed as median with interquartile range or number (percentage). NYHA, New York Heart Association; SMD, standardized mean difference; BMI, body mass index; AF, atrial fibrillation; MVR, mitral valve replacement; MVP, mitral valvuloplasty; AVR, aortic valve replacement; TVR, tricuspid valve replacement; TVP, tricuspid valvuloplasty; WBC, white blood cell; PLT, platelet; TBil, total bilirubin; EF, ejection fraction. CPB, cardiopulmonary bypass; ACC, aortic cross clamp; ICU, intensive care unit; IABP, intra-aortic balloon pump; ECMO, extracorporeal membrane oxygenation; CRRT, continuous renal replacement therapy.