

Table S1 Baseline demographics: heterotopic *vs.* orthotopic TTVR

Parameters	TTVR-H (n=10)	TTVR-O (n=28)	P value
Demographics			
Age (years)	83.0±6.1	73.6±8.5	0.005
Male	5 (50.0)	9 (32.1)	0.533
Body weight (kg)	55.3±0.0	61.5±9.2	0.154
BMI (kg/m ²)	22.1 (19-24)	24.2 (23-26)	0.033
Smoker	1 (10.0)	4 (14.3)	>0.99
Baseline NYHA			0.609
Class I	0	0	
Class II	7 (70.0)	18 (64.3)	
Class III	2 (20.0)	9 (32.1)	
Class IV	1 (10.0)	1 (3.6)	
Comorbidities			
Hypertension	7 (70.0)	10 (35.7)	0.133
Hyperlipidemia	5 (50.0)	5 (17.9)	0.118
Diabetes	3 (30.0)	4 (14.3)	0.532
Atrial fibrillation	9 (90.0)	24 (85.7)	>0.99
Coronary artery disease	2 (20.0)	6 (21.4)	>0.99
Prior PCI	1 (10.0)	5 (17.9)	0.936
Prior myocardial infarction	0	0	NA
Prior stroke	1 (10.0)	5 (17.9)	0.936
COPD	0	1 (3.4)	>0.99
Asthma	0	0	NA
Prior cardiac surgery	3 (30.0)	11 (39.3)	0.888
Peripheral artery disease	0	0	NA
Prior CIED	3 (30.0)	6 (21.4)	0.909
EuroSCORE II	4.0 [3.6–4.2]	3.4 [1.7–4.9]	0.518
TRI-SCORE	5.8±2.4	4.2±2.5	0.249
Laboratory results			
Hemoglobin (g/dL)	12.8 [12–26]	12 [12–14]	0.196
Platelet (count/μL)	166,700±37,538	160,571±59,412	0.497
Creatinine (mg/L)	1.3±0.4	1.1±0.4	0.238
Albumin (g/L)	35.8±8.6	36.1±5.1	0.752
Bilirubin (mg/dL)	1.3 [1.0–1.6]	1.0 [0.8–1.3]	0.078
NTproBNP (pg/mL)	1,724 [1,082–2,413]	1,137 [575–2,192]	0.237

Table S1 (continued)

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Parameters	TTVR-H (n=10)	TTVR-O (n=28)	P value
Medications			
Beta-blocker	7 (70.0)	19 (67.9)	0.767
ACEi/ARB/ARNI	5 (50.0)	11 (39.3)	0.829
Aldosterone antagonist	7 (70.0)	15 (53.6)	0.596
Furosemide	7 (70.0)	22 (78.6)	0.909
Thiazide diuretics	0	5 (17.9)	0.374
SGLT2i	4 (40.0)	13 (46.4)	>0.99
Aspirin	0	2 (7.1)	0.965
Other antiplatelet	1 (10.0)	1 (3.6)	>0.99
OAC	10 (100.0)	23 (82.1)	0.374

Data are presented as mean \pm SD, number (%), or median [IQR]. ACEi, angiotensin-converting enzyme inhibitors; ARB, angiotensin receptor blockers; ARNI, angiotensin receptor-neprilysin inhibitor; BMI, body mass index; CIED, cardiac implantable electronic device; COPD, chronic obstructive pulmonary disease; IQR, interquartile range; NTproBNP, N-terminal pro B-type natriuretic peptide; NYHA, New York Heart Association; OAC, oral anticoagulant; PCI, percutaneous coronary intervention; SD, standard deviation; SGLT2i, sodium-glucose cotransporter-2 inhibitor; T-TEER, tricuspid transcatheter edge-to-edge repair; TTVR, transcatheter tricuspid valve replacement.

Table S2 In-patient outcomes: TTVR-H vs. TTVR-O

Outcome measures	TTVR-H (n=10)	TTVR-O (n=28)	P value
Composite of major adverse events	2 (20.0)	4 (14.3)	0.891
Mortality	0	0	NA
MI	0	0	NA
Stroke	0	0	NA
Device embolization	0	0	NA
New onset renal failure requiring dialysis	0	0	NA
Life-threatening bleeding	0	0	NA
Cardiac tamponade	1 (10.0)	1 (3.6)	0.435
Conversion to open heart	2 (20.0) [†]	0	0.064
Major vascular complication	1 (10.0)	3 (10.7)	0.947
New pacemaker needed	0	0	NA
LOS post-procedure (days)	7.0 [4–27]	20.0 [12–31]	0.109
Trough hemoglobin (g/dL)	10.1±1.9	9.4±2.2	0.469
Change in hemoglobin (g/dL)	–4.0 [–20.7 to –1.3]	–2.4 [–3.4 to –1.8]	0.651
Trough platelet (count/μL)	112,444±35,323	63,047±27,172	0.002
Change in platelet (count/μL)	–70,000 [–71,000 to –46,000]	–103,000 [–128,000 to –69,000]	0.016
Post-operative oral anticoagulant	10 (100.0)	28 (100.0)	>0.99

Data are presented as number (%), median [IQR], or mean ± SD. [†], both cases were heterotopic valve implantation, one with cardiac tamponade and inferior vena cava injury and another with device migration, both cases survived after open heart repair. IQR, interquartile range; LOS, length of stay; MI, myocardial infarction; SD, standard deviation; TTVR-H, heterotopic transcatheter tricuspid valve replacement; TTVR-O, orthotopic transcatheter tricuspid valve replacement.

Table S3 In-patient outcomes: T-TEER vs. TTVR-O

Outcome measures	T-TEER group (n=136)	TTVR-O group (n=28)	P value
Composite of major adverse events	3 (2.2)	4 (14.3)	0.017
Mortality	0	0	NA
MI	0	0	NA
Stroke	0	0	NA
Device embolization	0	0	NA
New onset renal failure requiring dialysis	0	0	NA
Life-threatening bleeding	1 (0.7) [†]	0	>0.99
Cardiac tamponade	0	1 (3.6)	0.171
Conversion to open heart	0	0	NA
Major vascular complication	2 (1.5)	3 (10.7)	0.036
New pacemaker needed	0	0	NA
LOS post-procedure (days)	5.0 [3–7]	20.0 [12–31]	<0.001
Trough hemoglobin (g/dL)	10.4±2.0	9.4±2.2	0.085
Change in hemoglobin (g/dL)	–0.70 [–1.5 to 0]	–2.4 [–3.4 to –1.8]	<0.001
Trough platelet (count/μL)	133,291±47,257	63,047±27,172	<0.001
Change in platelet (count/μL)	–23,000 [–46,000 to 0]	–103,000 [–128,000 to –69,000]	<0.001
Post-operative oral anticoagulant	102 (75.0)	28 (100.0)	0.001

Data are presented as number (%), median [IQR], or mean ± SD. [†], gastrointestinal bleeding with esophageal perforation. IQR, interquartile range; LOS, length of stay; MI, myocardial infarction; SD, standard deviation; T-TEER, tricuspid transcatheter edge-to-edge repair; TTVR-O, orthotopic transcatheter tricuspid valve replacement.

Table S4 In-patient outcomes of standalone T-TEER vs. standalone TTVR-O (without mitral valve interventions)

Outcome measures	Standalone T-TEER (n=78)	Standalone TTVR-O (n=27)	P value
Composite of major adverse events	2 (2.6)	4 (14.8)	0.045
Mortality	0	0	NA
MI	0	0	NA
Stroke	0	0	NA
Device embolization	0	0	NA
New onset renal failure requiring dialysis	0	0	NA
Life-threatening bleeding	1 (1.3)	0	>0.99
Cardiac tamponade	0	1 (3.7)	0.257
Conversion to open heart	0	0	NA
Major vascular complication	1 (1.3)	3 (11.1)	0.051
New pacemaker needed	0	0	NA
LOS post-procedure (days)	4 [2–5]	20 [12–30]	<0.001
Trough hemoglobin (g/dL)	10.9±2.1	9.4±2.2	0.014
Change in hemoglobin (g/dL)	−0.3 [−1.3 to 0]	−2.4 [−3.4 to −1.8]	<0.001
Trough platelet (count/μL)	137,565±41,592	63,047±27,172	<0.001
Change in platelet (count/μL)	−22,000 [−38,000 to 0]	−103,000 [−128,000 to −69,000]	<0.001
Post-operative oral anticoagulant	–	27 (100.0)	–

Data are presented as number (%), median [IQR], or mean ± SD. IQR, interquartile range; LOS, length of stay; MI, myocardial infarction; SD, standard deviation; T-TEER, tricuspid transcatheter edge-to-edge repair; TTVR-O, orthotopic transcatheter tricuspid valve replacement.

Table S5 Predictors of outcomes

Parameters	TR ≤ moderate at 30 days		In-patient MAE	
	OR (95% CI)	P value	OR (95% CI)	P value
Treatment = TTVR-O	4.5 (0.6–99.3)	0.212	0.96 (0.03–15.5)	0.979
Coaptation gap	1.0 (1.0–1.1)	0.633	0.96 (0.6–1.1)	0.726
TR ERO	0.45 (0.03–6.2)	0.541	13.0 (0.3–935)	0.198
MR severity	0.91 (0.5–1.8)	0.782	0.93 (0.2–3.3)	0.915

ERO, effective regurgitant orifice; MAE, major adverse events; MR, mitral regurgitation; TR, tricuspid regurgitation; TTVR-O, orthotopic transcatheter tricuspid valve replacement.