

**Features and outcomes of bailout repeat transcatheter aortic valve implantation (TAVI): evidence from the Bailout Acute TAVI-in-TAVI to Lessen Events (BATTLE) international registry**

**Online supplement**

**Table 1S.** Baseline imaging features. TAVI=transcatheter aortic valve implantation.

Features	Control	TAVI-in-TAVI	P value
Patients	212	106	-
Aortic valve area (cm <sup>2</sup> )	0.66±0.21	0.69±0.25	0.298
Peak aortic valve gradient (mm Hg)	79±25	78±77	0.782
Mean aortic valve gradient (mm Hg)	49±17	48±18	0.754
Bicuspid aortic valve	9 (4.3%)	4 (3.8%)	1
Significant aortic valve calcification	111 (52.4%)	76 (71.7%)	0.001
Aortic regurgitation			0.161
None or trivial	151 (71.2%)	77 (72.6%)	
Mild	44 (20.8%)	18 (17.0%)	
Moderate	16 (7.6%)	7 (6.6%)	
Moderate to severe	1 (0.5%)	4 (3.8%)	
Maximum aortic anulus diameter (mm)	26±4	26±4	0.840
Sinus of Valsalva diameter (mm)	31±4	33±4	0.014
Sino-tubular junction diameter (mm)	28±3	30±5	0.008
Ascending aortic diameter (mm)	34±5	36±5	0.014
Porcelain aorta	1 (0.5%)	0	1
Left ventricular end-diastolic diameter (mm)	48±7	49±9	0.179
Left ventricular end-systolic diameter (mm)	34±9	34±9	0.812
Septal thickness (mm)	14±3	14±3	0.401
Posterior wall thickness (mm)	13±2	12±2	0.149
Left ventricular ejection fraction (%)	55±11	53±13	0.314
Left ventricular outflow diameter (mm)	20±3	20±3	0.351
Low flow-low gradient aortic stenosis	7 (3.3%)	10 (9.4%)	0.032
Mitral regurgitation			0.971
None or trivial	34 (16.0%)	15 (14.2%)	
Mild	101 (47.6%)	54 (50.9%)	
Moderate	69 (32.6%)	34 (32.1%)	
Moderate to severe	4 (1.9%)	1 (0.9%)	
Severe	4 (1.9%)	2 (1.9%)	
Systolic pulmonary artery pressure (mm Hg)	43±13	42±11	0.514

**Table 2S.** Reasons for TAVI-in-TAVI. TAVI=transcatheter aortic valve implantation.

<b>Features</b>	<b>Count</b>	<b>%</b>
Cranial embolization	10	9.4%
Low implantation	3	2.8%
Significant aortic regurgitation or paravalvular leak	9	8.5%
Not reported	84	79.3%

**Table 3S.** Devices used for TAVI-in-TAVI. TAVI=transcatheter aortic valve implantation.

		Second device							
		Acurate	Allegra	CoreValve	Evolut	Jena Valve	Myval	Portico/ Navitor	Sapien
First device	Accurate	4 (30.8%)	0	0	3 (23.1%)	0	0	0	6 (46.2%)
	Allegra	0	3 (60.0%)	0	2 (40.0%)		0	0	0
	CoreValve	0	0	36 (97.3%)	1 (2.7%)	0	0	0	0
	Evolut	0	0	1 (3.5%)	24 (82.8%)	0	0	0	4 (13.8%)
	Jena Valve	0	0	0	0	1 (50.0%)	0	0	1 (50.0%)
	Myval	0	0	0	0	0	2 (100%)	0	0
	Portico/ Navitor	0	0	0	0	0	1 (11.1%)	7 (77.8%)	1 (11.1%)
	Sapien	0	0	1 (11.1%)	0	0	0	0	8 (88.9%)

**Table 4S.** Postprocedural and inhospital outcomes. TAVI=transcatheter aortic valve implantation.

Features	Control	TAVI-in-TAVI	P value
Patients	212	106	-
Postprocedural echocardiogram			
Peak aortic valve gradient (mm Hg)	17±11	14±8	0.064
Mean aortic valve gradient (mm Hg)	9±5	8±5	0.085
Aortic regurgitation			0.196
None or trivial	122 (60.4%)	57 (55.3%)	
Mild	66 (32.7%)	34 (33.0%)	
Moderate	1 (0.5%)	4 (4.9%)	
Moderate to severe	1 (0.5%)	0	
Mitral regurgitation			0.464
None or trivial	87 (54.4%)	37 (43.0%)	
Mild	50 (31.3%)	32 (37.2%)	
Moderate	16 (10.0%)	11 (12.8%)	
Moderate to severe	5 (3.1%)	4 (4.7%)	
Severe	2 (1.3%)	2 (2.3%)	
Discharge echocardiogram			
Peak aortic valve gradient (mm Hg)	17±9	16±8	0.318
Mean aortic valve gradient (mm Hg)	9±5	9±5	0.305
Aortic regurgitation			0.112
None or trivial	116 (55.5%)	51 (56.7%)	
Mild	79 (37.8%)	29 (32.2%)	
Moderate	14 (6.7%)	7 (7.8%)	
Moderate to severe	0	2 (2.2%)	
Severe	0	1 (1.1%)	
Mitral regurgitation			0.720
None or trivial	24 (14.1%)	7 (8.8%)	
Mild	98 (57.7%)	48 (60.0%)	
Moderate	37 (21.8%)	19 (23.8%)	
Moderate to severe	7 (4.1%)	5 (6.3%)	
Severe	4 (2.4%)	1 (1.3%)	
Systolic pulmonary artery pressure (mm Hg)	40±13	40±11	0.803
Hospital stay (days)	6±6	7±6	0.153
Inhospital outcomes			
Death	3 (1.4%)	16 (15.1%)	<0.001
Myocardial infarction	1 (0.5%)	1 (0.9%)	1
Stroke	3 (1.4%)	3 (2.8%)	0.404
Access site complication	33 (15.6%)	17 (16.0%)	1
Bleeding	43 (20.3%)	27 (25.5%)	0.316
Significant coronary obstruction	3 (1.4%)	0	0.553
Major bleeding	23 (10.9%)	15 (14.2%)	0.463
Emergency surgery	1 (0.5%)	4 (3.8%)	0.044
Pacemaker implantation	20 (9.4%)	23 (21.7%)	0.005
Tamponade	3 (1.4%)	5 (4.7%)	0.123
Major adverse event*	48 (22.6%)	41 (38.7%)	0.003

\*composite of death, myocardial infarction, stroke, major bleeding, or reintervention

**Table 5S.** Follow-up assessments. TAVI=transcatheter aortic valve implantation.

Features	Control	TAVI-in-TAVI	P value
1-month follow-up			
Patients	110	64	-
New York Heart Association			0.643
I	58 (52.7%)	32 (50.0%)	
II	40 (36.4%)	28 (43.8%)	
III	10 (9.1%)	4 (6.3%)	
IV	2 (1.8%)	0	
Peak aortic valve gradient (mm Hg)	18±10	16±9	0.326
Mean aortic valve gradient (mm Hg)	10±5	9±5	0.194
Aortic regurgitation			0.829
None or trivial	43 (49.4%)	29 (53.7%)	
Mild	34 (39.1%)	18 (33.3%)	
Moderate	10 (11.5%)	7 (13.0%)	
Moderate to severe	0	0	
Mitral regurgitation			0.638
None or trivial	9 (12.2%)	8 (15.7%)	
Mild	43 (58.1%)	27 (52.9%)	
Moderate	14 (18.9%)	11 (21.6%)	
Moderate to severe			
Severe			
Systolic pulmonary artery pressure (mm Hg)	40±16	39±17	0.635
12-month follow-up			
Patients	127	61	-
New York Heart Association			0.774
I	55 (43.3%)	28 (45.9%)	
II	54 (42.5%)	28 (45.9%)	
III	14 (11.0%)	4 (6.6%)	
IV	4 (3.2%)	1 (1.6%)	
Peak aortic valve gradient (mm Hg)	19±9	18±9	0.615
Mean aortic valve gradient (mm Hg)	10±6	10±5	0.436
Aortic regurgitation			0.790
None or trivial	31 (40.3%)	19 (37.3%)	
Mild	36 (46.8%)	27 (52.9%)	
Moderate	10 (13.0%)	5 (9.8%)	
Moderate to severe	0	0	
Mitral regurgitation			0.722
None or trivial	9 (11.4%)	8 (16.0%)	
Mild	48 (60.8%)	28 (56.0%)	
Moderate	19 (24.1%)	11 (22.0%)	
Moderate to severe	2 (2.5%)	3 (6.0%)	
Severe	1 (1.3%)	0	
Systolic pulmonary artery pressure (mm Hg)	40±12	39±13	0.722

**Table 6S.** Long-term outcomes censoring events occurring <1 month. TAVI=transcatheter aortic valve implantation.

<b>Features</b>	<b>Control</b>	<b>TAVI-in-TAVI</b>	<b>P value</b>
Patients	137	62	-
Follow-up (months)	2.8±2.4	3.0±2.5	0.583
Death	68 (37.8%)	35 (44.9%)	0.333
Cardiovascular death	41 (22.8%)	15 (19.2%)	0.623
Myocardial infarction	5 (4.0%)	1 (2.1%)	1
Stroke	10 (7.9%)	2 (4.3%)	0.517
Bleeding	0	1 (2.1%)	0.272
Major bleeding	0	0	-
Aortic valve reintervention	1 (0.8%)	0	1
Major adverse event*	49 (38.9%)	19 (40.4%)	0.863

\*composite of death, myocardial infarction, stroke, major bleeding, or aortic valve reintervention

**Table 7S.** Unadjusted, adjusted and inverse probability of treatment weighted analyses for death and major adverse event. HR=hazard ratio; OR=odds ratio; TAVI=transcatheter aortic valve implantation.

Features	Unadjusted analysis	Adjusted analysis*	Inverse probability of treatment weighted analysis
Inhospital			
Death	OR=12.39 (3.52-43.56), p<0.001	OR=16.24 (2.01-131.44), p=0.009	OR=10.45 (4.19-26.03), p<0.001
Major adverse event	OR=2.16 (1.30-3.58), p=0.003	OR=2.34 (1.26-4.36), p=0.007	OR=2.10 (1.44-3.05), p<0.001
Cumulative at long-term			
Death	HR=1.55 (1.09-2.20), p=0.015	HR=1.93 (1.19-3.12), p=0.007	HR=1.37 (1.04- 1.81), p=0.025
Major adverse event	HR=1.46 (1.07-1.99), p=0.018	HR=1.80 (1.19- 2.72), p=0.005	HR=1.38 (1.10- 1.74), p=0.005
At long-term after censoring 1-month events			
Death	HR=1.15 (0.76-1.72), p=0.513	HR=1.68 (0.96- 2.93), p=0.068	HR=1.02 (0.75-1.39), p=0.897
Major adverse event	HR=1.18 (0.69-2.01), p=0.548	HR=1.97 (0.75-5.19), p=0.171	HR=1.11 (0.71-1.73), p=0.645

\*adjusting for age, gender, body mass index, diagnosis, logistic EuroSCORE, EuroSCORE II, baseline New York Heart Association, approach, use of a balloon-expandable valve, and postdilatation; OR or HR <1 favor TAVI-in-TAVI, OR or HR >1 favor control.

**Figure 1S.** Cumulative failure curves for death (top) and major adverse event (bottom). TAVI=transcatheter aortic valve implantation.

