Supplementary table 1 (Table S1)

Preoperative cohort characteristics and perioperative data

Preoperative cohort characteristics:			
Continuous variables:	**UHS (n=20)**	**FS (n=20)**	***P* value**
Weight (kg)	76 (66.5; 89.3)	91 (80.3; 99)	**0.02**
Height (cm)	163 (155.3; 172.3)	169.5 (163; 173.8)	0.21
BMI (kg/m^2)	28.4 (25.1; 32.4)	30.9 (28.2; 34.4)	0.09
Creatinine (μmol/l)	78.5 (71.5; 93.8)	95 (75.8; 111.8)	0.06
LVEF (%)	65 (61.3; 65)	65 (60; 66.8)	0.98
EuroSCORE II (%)	1.5 (1; 1.9)	1.1 (0.8; 1.6)	0.09
Categorical variables			
Women	9 (45 %)	4 (20 %)	0.17
Diabetes mellitus	9 (45 %)	11 (55 %)	0.53
Arterial hypertension	15 (75 %)	17 (85 %)	0.69
Ex-smokers	2 (10 %)	8 (40 %)	0.06
Stroke	1 (5 %)	0 (0 %)	1.00
Peripheral atherosclerosis	3 (15 %)	0 (0 %)	0.23
Dyslipidemia	14 (70 %)	15 (75 %)	0.72
Respiratory disease	3 (15 %)	1 (5 %)	0.60
Musculoskeletal disease	10 (50 %)	7 (35 %)	0.52
NYHA class:			0.43
I	1 (5 %)	3 (15 %)	
II	10 (50 %)	11 (55 %)	
III	9 (45 %)	6 (30 %)	
IV	0 (0 %)	0 (0 %)	
Bicuspid valve	6 (30 %)	6 (30 %)	1.00
Indications for surgery			1.00
stenosis	15 (75 %)	14 (70 %)	

regurgitation	1 (5 %)	1 (5 %)	
combined	5 (25 %)	5 (25 %)	
Pulmonary hypertension	3 (15 %)	7 (35 %)	0.27

Operative and early postoperative outcomes:

Continuous variables:	UHS (n=20)	FS (n=20)	p value
OP times (min)	175 (151.3; 185)	160 (141.3; 173.8)	**0.02**
CPB time (min)	87 (73.8; 100.3)	73 (71.3; 84.8)	0.08
CxC time (min)	66 (56.3; 70)	58.5 (55; 65.8)	0.17
VT (hours)	10 (6.9; 13.1)	8.8 (7.1; 13.8)	0.77
24h blood loss (ml)	250 (200; 300)	400 (300; 587.5)	**<0.001**
Transfusions (n)	2 (1; 3.8)	0.5 (0; 3.5)	0.17
ICU length of stay (hours)	24 (19.1; 40.4)	21.1 (18; 41.9)	0.67
Hospital length of stay (days)	9 (8.3; 12.8)	9 (7.3; 10)	0.23
Categorical variables:			
Revision for bleeding	1 (5 %)	2 (10 %)	1.00
Respiratory infection	1 (5 %)	0 (0 %)	1.00
Oxygenation dysfunction	4 (20 %)	1 (5 %)	0.34
Wound complication	0 (0 %)	1 (5 %)	1.00
Neurological complication	2 (10 %)	1 (5 %)	0.60
Atrial fibrillation	7 (35 %)	7 (35 %)	1.00
Conduction block	2 (10 %)	2 (10 %)	1.00

BMI - body mass index, CPB - cardiopulmonary bypass, CxC - aortic cross-clamp, FS - full sternotomy, ICU - intensive care unit, LVEF - left ventricular ejection fraction, NYHA - New York Heart Association dyspnea classification, OP - operation, Pulmonary hypertension - gradient of > 35 mmHg, Respiratory disease - chronic obstructive pulmonary disease or bronchial asthma, UHS - upper hemi-sternotomy, VT - ventilation time.

Supplementary table 2 (Table S2)

Complete Pulmonary function testing and Short Form-36 Quality of Life questionnaire outcomes

	UHS	FS	*P* value
Pulmonary Function Testing:			
FEV1 D_0	99.5 (88.5; 110)	80 (75.3; 91)	**0.002**
FEV1 D_7	67 (59.3; 79.5)	61 (56.3; 73)	0.40
FEV1 D_{90}	97 (87.8; 106.3)	84 (75.8; 92.5)	**0.008**
FEV1 Δ_{D7-D0}	-34 (-40.8; -23)	-19 (-24; -13.5)	**0.003**
FEV1 $\delta_{D7/D0}$	0.71 (0.60; 0.76)	0.77 (0.74; 0.83)	**0.05**
FEV1 Δ_{D90-D0}	-1.1 (-11.5; 11.5)	1 (-7.3; 10)	0.53
FEV1 $\delta_{D90/D0}$	1.00 (0.88; 1.12)	1.10 (0.92; 1.14)	0.46
FEV1/VC D_0	73.5 (71.5; 79.8)	65 (61; 74.5)	**0.002**
FEV1/VC D_7	74 (68.3; 78.8)	66.5 (61.3; 72.8)	**0.007**
FEV1/VC D_{90}	73 (70.8; 77.3)	65 (60.3; 70.8)	**0.006**
FEV1/VC Δ_{D7-D0}	-3.6 (-5.8; 3)	2 (-2; 4)	0.46
FEV1/VC $\delta_{D7/D0}$	1 (0.93; 1.04)	1.03 (0.97; 1.07)	0.25
FEV1/VC Δ_{D90-D0}	-1.5 (-4.5; 2)	-1 (-4.3; 3.5)	0.56
FEV1/VC $\delta_{D90/D0}$	0.98 (0.94; 1.03)	0.99 (0.94; 1.05)	0.56
FEV1/FVC D_0	79 (76; 85)	69 (62.5; 78)	**< 0.001**
FEV1/FVC D_7	78.5 (71.5; 81.8)	69 (62.5; 74.5)	**<0.001**
FEV1/FVC D_{90}	75.5 (72; 79.5)	67.5 (65.8; 78.5)	**0.03**
FEV1/FVC Δ_{D7-D0}	-1 (-5.3; 2)	0 (-2.8; 3.8)	0.77
FEV1/FVC $\delta_{D7/D0}$	0.99 (0.94; 1.03)	1(0.96; 1.05)	0.79
FEV1/FVC Δ_{D90-D0}	-3.5 (-6; 1)	0 (-3; 3.5)	**0.03**
FEV1/FVC $\delta_{D90/D0}$	0.96 (0.93; 1.01)	1.00 (0.96; 1.05)	**0.03**
MEF50% D_0	79.5 (53.5; 101.3)	46.5 (34.3; 85.3)	**<0.001**
MEF50% D_7	52 (40.3; 65.8)	34 (24; 50.3)	0.12
MEF50% D_{90}	72.5 (47.5; 86)	47 (40.8; 81.3)	0.11
MEF50% Δ_{D7-D0}	-23.5 (-39.8; -14.8)	-12 (-21.8; -6.3)	**0.04**
MEF50% $\delta_{D7/D0}$	0.63 (0.54; 0.77)	0.70 (0.60; 0.86)	0.35
MEF50% Δ_{D90-D0}	-8 (-24; 4.3)	-0.5 (-7; 7.3)	0.13
MEF50% $\delta_{D90/D0}$	0.87 (0.76; 1.06)	0.99 (0.90; 1.20)	**0.03**
VC D_0	100 (94.3; 113.8)	96 (89; 102)	0.08
VC D_7	72 (65; 76.5)	74.5 (64; 77.8)	0.81
VC D_{90}	101 (92.5; 109)	95.5 (89.3; 106)	0.12

VC Δ_{D7-D0}	-32.5 (-44.5; -20.8)	-22.5 (-31; -14.5)	**0.03**
VC $\delta_{D7/D0}$	0.72 (0.62; 0.76)	0.76 (0.67; 0.84)	0.07
VC Δ_{D90-D0}	3.5 (-10.3; 8.3)	-1.5 (-7.5; 11.3)	0.83
VC $\delta_{D90/D0}$	1.04 (0.90; 1.08)	0.98 (0.93; 1.12)	0.65
FVC D_0	97 (92.3; 101.8)	91.5 (85; 100.8)	0.16
FVC D_7	69 (62; 77.5)	71.5 (60.5; 79.5)	0.63
FVC D_{90}	97 (91; 109.3)	93.5 (86.8; 99)	0.08
FVC Δ_{D7-D0}	-31 (-38.8; -20)	-20.5 (-26.5; -15)	**0.03**
FVC $\delta_{D7/D0}$	0.71 (0.62; 0.79)	0.78 (0.71; 0.81)	0.07
FVC Δ_{D90-D0}	2.5 (-4; 14.3)	2 (-7.3; 7.3)	0.70
FVC $\delta_{D90/D0}$	1.03 (0.96; 1.14)	1.02 (0.92; 1.09)	0.87
TLC D_0	98.5 (88; 111.5)	102 (94; 105.8)	0.45
TLC D_7	77.5 (68.5; 82)	82.5 (74.8; 90)	0.17
TLC D_{90}	92 (85.8; 100.8)	97.5 (91; 105.3)	0.42
TLC Δ_{D7-D0}	-19.5 (-28.8; -13.3)	-15 (-30.8; -10)	0.70
TLC $\delta_{D7/D0}$	0.80 (0.75; 0.85)	0.84 (0.71; 0.90)	0.36
TLC Δ_{D90-D0}	-7 (-10; 5.3)	-4.5 (-8.3; 3.3)	0.95
TLC $\delta_{D90/D0}$	0.93 (0.90; 1.06)	0.96 (0.92; 1.04)	0.50
RV D_0	101.5 (84; 127.8)	121 (100.8; 130.3)	0.50
RV D_7	84.5 (75; 101.8)	102.5 (90.8; 118)	0.53
RV D_{90}	94 (85.3; 108.5)	110 (100.8; 127.8)	**0.02**
RV Δ_{D7-D0}	-10.5 (-28; 3.5)	-13.5 (-28.8; 4.8)	0.82
RV $\delta_{D7/D0}$	0.90 (0.76; 1.05)	0.90 (0.76; 1.05)	1.00
RV Δ_{D90-D0}	-4.5 (-27.3; 3.5)	-10 (-24.8; 11)	0.97
RV $\delta_{D90/D0}$	0.95 (0.77; 1.04)	0.92 (0.81; 1.10)	0.86
RV/TLC D_0	47 (39; 49.8)	46.5 (45; 50)	0.17
RV/TLC D_7	50.5 (44.3; 55.5)	51 (46; 56)	0.73
RV/TLC D_{90}	43 (39.8; 47.5)	45.5 (40.8; 47.5)	0.46
RV/TLC Δ_{D7-D0}	7 (-0.3; 10.8)	3 (-0.8; 8.8)	0.28
RV/TLC $\delta_{D7/D0}$	1.15 (1.01; 1.24)	1.06 (1.00; 1.21)	0.33
RV/TLC Δ_{D90-D0}	-2.5 (-6.5; 2.3)	-3 (-7.5; 0.5)	0.76
RV/TLC $\delta_{D90/D0}$	0.94 (0.87; 1.05)	0.94 (0.84; 1.01)	1.00
Raw D_0	88.5 (59.3; 115.8)	104.5 (80.3; 134)	**0.03**
Raw D_7	70 (53.5; 114.3)	112 (102; 134.3)	0.06
Raw D_{90}	81.5 (59.3; 116)	96.5 (76.8; 131.8)	0.28
Raw Δ_{D7-D0}	-4.5 (-45; 29.8)	-4 (-21.5; 31.8)	0.63
Raw $\delta_{D7/D0}$	0.97 (0.55; 1.59)	0.97 (0.86; 1.35)	0.33

Raw Δ_{D90-D0}	2 (-18; 34.8)	-7.5 (-42.3; 8.8)	0.22
Raw $\delta_{D90/D0}$	1.03 (0.84; 1.35)	0.93 (0.68; 1.09)	0.50
TL_{CO} D_0	76 (68.5; 82.8)	78.5 (66.3; 90.8)	0.86
TL_{CO} D_7	54 (44.8; 69.3)	56.5 (50.8; 67.8)	0.98
TL_{CO} D_{90}	75 (65.3; 84.5)	73 (62.5; 87)	0.92
TL_{CO} Δ_{D7-D0}	-19 (-28.8; -12.5)	-18 (-25.5; -11.8)	0.59
TL_{CO} $\delta_{D7/D0}$	0.72 (0.61; 0.84)	0.76 (0.70; 0.83)	0.55
TL_{CO} Δ_{D90-D0}	-4 (-9.3; 0.8)	-4 (-10; 6.3)	0.85
TL_{CO} $\delta_{D90/D0}$	0.95 (0.89; 1.01)	0.95 (0.87; 1.08)	0.84
K_{CO} D_0	90.5 (78; 100.8)	92 (78.8; 105.3)	0.65
K_{CO} D_7	91.5 (74.3; 103.8)	90 (80.3; 99.3)	0.70
K_{CO} D_{90}	91 (78.8; 104.8)	87.5 (70.8; 105)	0.36
K_{CO} Δ_{D7-D0}	-4 (-12; 6)	-1.5 (-6; 2)	0.84
K_{CO} $\delta_{D7/D0}$	0.97 (0.85; 1.08)	0.98 (0.93; 1.02)	0.84
K_{CO} Δ_{D90-D0}	-4.5 (-11; 2.8)	-4 (-12.8; 4)	0.47
K_{CO} $\delta_{D90/D0}$	0.95 (0.91; 1.04)	0.95 (0.87; 1.06)	0.51
Health-Related Quality of Life:			
PF D_0	50 (28.8; 62.5)	67.5 (40; 86.3)	0.10
PF D_{90}	85 (63.8; 91.3)	80 (55; 90)	0.61
PF Δ_{D90-D0}	30 (7.5; 40)	2.5 (0; 18.8)	**0.03**
PF $\delta_{D90/D0}$	1.65 (1.15; 2.04)	1.06 (1.00; 1.63)	0.06
GH D_0	55 (38.8; 71.3)	52.5 (40; 61.3)	0.67
GH D_{90}	80 (62.5; 86.3)	60 (48.8; 67.5)	**0.01**
GH Δ_{D90-D0}	10 (3.8; 27.5)	2.5 (0; 11.3)	0.28
GH $\delta_{D90/D0}$	1.16 (1.05; 1.60)	1.04 (1.00; 1.27)	0.27
PRF D_0	12.5 (0; 56.3)	25 (0; 75)	0.65
PRF D_{90}	100 (50; 100)	62.5 (25; 100)	0.31
PRF Δ_{D90-D0}	37.5 (0; 81.3)	25 (0; 50)	0.29
PRF $\delta_{D90/D0}$	1.33 (1.00; 2.50)	1.00 (1.00; 1.63)	0.33
ERF D_0	33 (0; 67)	66.9 (0; 100)	0.26
ERF D_{90}	100 (66.9; 100)	100 (67; 100)	0.75
ERF Δ_{D90-D0}	33.2 (0; 75.3)	0 (0; 42.3)	0.17
ERF $\delta_{D90/D0}$	1.49 (1.00; 2.53)	1.00 (1.00; 1.50)	0.24
V D_0	47.5 (33.8; 75)	52.5 (43.8; 75)	0.53
V D_{90}	75 (53.8; 82.5)	60 (50; 80)	0.43

V Δ_{D90-D0}	15 (0; 30)	5 (0; 16.3)	0.50
V $\delta_{D90/D0}$	1.20 (1.00; 1.70)	1.11 (1.00; 1.28)	0.50
MH D_0	76 (55; 88)	66 (52; 89)	0.62
MH D_{90}	90 (76; 96)	82 (62; 92)	0.28
MH Δ_{D90-D0}	8 (0; 21)	4 (0; 12)	0.62
MH $\delta_{D90/D0}$	1.09 (1.00; 1.37)	1.05 (1.00; 1.18)	0.97
SRF D_0	69 (50; 88)	63 (47; 88)	0.77
SRF D_{90}	100 (75; 100)	87.8 (72; 100)	0.31
SRF Δ_{D90-D0}	12.5 (0; 37.3)	12 (0; 28)	0.47
SRF $\delta_{D90/D0}$	1.17 (1.00; 1.63)	1.24 (1.00; 1.59)	0.75
BP D_0	57.5 (42.9; 88)	55 (44.5; 85)	0.88
BP D_{90}	85 (55; 100)	77.5 (57.3; 100)	0.82
BP Δ_{D90-D0}	12 (0; 28)	7.5 (0; 35)	0.70
BP $\delta_{D90/D0}$	1.15 (1.00; 1.71)	1.13 (1.00; 1.81)	0.54

BP - bodily pain, D_0 - preoperative measurement, D_7 - measurement on 7th postoperative day, D_{90} - measurement after 3 months, Δ - actual difference of the values, δ - relative difference of the values, ERF - emotional role functioning, FEV1 - forced expiratory volume in the first second, FEV1/FVC - Tiffeneau-Pinelli index - forced expiratory volume in the first second divided by forced vital capacity, FEV1/VC - forced expiratory volume in the first second divided by vital capacity (FEV1/VC), FS - full sternotomy, FVC -forced vital capacity, GH - general health, K_{CO} - transfer coefficient of the lung for carbon monooxide, MEF50% - maximal expiratory flow at 50% of vital flow capacity, MH - mental health, PF - physical functioning, PRF - physical role functioning, Raw -airway resistance, RV - residual volume, RV/TLC - residual volume divided by total lung capacity, SRF - social role functioning, TLC - total lung capacity, TL_{CO} - transfer factor of the lung for carbon monooxide, UHS - upper hemi-sternotomy, V - vitality, VC - vital capacity.