

## Supplementary material

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**Table S1.** Surgery scope, data and complications

Variable	All n = 204	VSARR n = 107	MB n = 35	BB n = 62	P-value
Ascending aorta graft diameter, mm	n = 161 30 (28.5–32)	n = 107 32 (30–34) <sup>*,#</sup>	n = 34 29 (27–30)	n = 20 30 (27–30)	<0.001
Aortic valve prosthesis diameter, mm	n = 97 27 (25–29)	–	n = 35 29 (27–29) <sup>&amp;</sup>	n = 62 27 (25–29)	–
Aortic annuloplasty, %	9 (4.4)	9 (8.4)	0	0	<0.001
Aortic cusp correction, %	64 (31.4)	64 (31.4)	0	0	<0.001
Ascending aorta replacement, %	163 (79.9)	97 (90.7) <sup>#</sup>	35 (100)	31 (50)	<0.001
Aortic arch replacement, %	12 (5.9)	6 (5.6)	4 (11.4)	2 (3.2%)	0.25
CABG, %	30 (14.7)	14 (13.1)	8 (22.9)	8 (12.9)	0.33
Mitral valve repair, %	19 (9.3)	5 (4.7)	5 (14.3)	9 (14.5)	0.06
Tricuspid valve repair, %	4 (2)	2 (1.9)	1 (2.9)	1 (1.6)	0.91

X-clamp, min	104 (81–130)	117 (90–136) <sup>#</sup>	95 (77–121)	86.5 (74–115)	0.001
CPB, min	130.5 (103.5–161.5)	145 (118–163) <sup>#</sup>	127 (107–176)	116.5 (94–137.5)	0.03
Drainage, ml	702 (550–928)	700 (550–920)	640 (500–800)	770 (550–990)	0.22
Ventilation time, h	13.6 (11.4–21.6)	13.3 (10.8–20.5)	14.3 (11.4–27.4)	13.7 (11.8–20.7)	0.27
ICU stay, days	2 (2–4)	2 (2–3) <sup>*#</sup>	3 (2–5)	3 (2–4)	0.001
Hospital stay, days	8 (7–11)	8 (7–10) <sup>*</sup>	9 (8–12) <sup>&amp;</sup>	7 (7–9.3)	0.003
Early mortality, %	6 (2.9)	3 (2.8)	0	3 (4.8)	0.40
Resternotomy for bleeding, %	23 (11.3)	10 (9.3)	5 (14.3)	8 (13.1)	0.63
Cardiac tamponade, %	4 (2.0)	4 (3.7)	0	0	0.16
Stroke, %	9 (4.4)	2 (1.9)	2 (5.7)	5 (8.1)	0.15
Renal failure, %	6 (2.9)	1 (0.9)	2 (5.7)	3 (4.8)	0.20
Pneumonia, %	5 (2.5)	2 (1.9)	1 (2.9)	2 (3.2)	0.84
Wound infection, %	1 (0.5)	1 (0.9)	0	0	0.63
Permanent pacemaker implantation, %	11 (5.4)	5 (4.7)	1 (2.9)	5 (8.1)	0.49

Data are presented as median (IQR) or n (%)

\* -  $P < 0.05$  VSARR vs MB, # -  $P < 0.05$  VSARR vs BB, & -  $P < 0.05$  MB vs BB.

Abbreviations: BB, bioBentall; CABG, coronary artery bypass graft; CPB, cardiopulmonary bypass; ICU, intensive care unit; MB, mechanical Bentall; VSARR, valve sparing aortic root replacement

**Video S1.** Aortic root replacement (bicuspid aortic valve reimplantation using the David method and aortic root replacement using the Freestyle bioprosthesis)