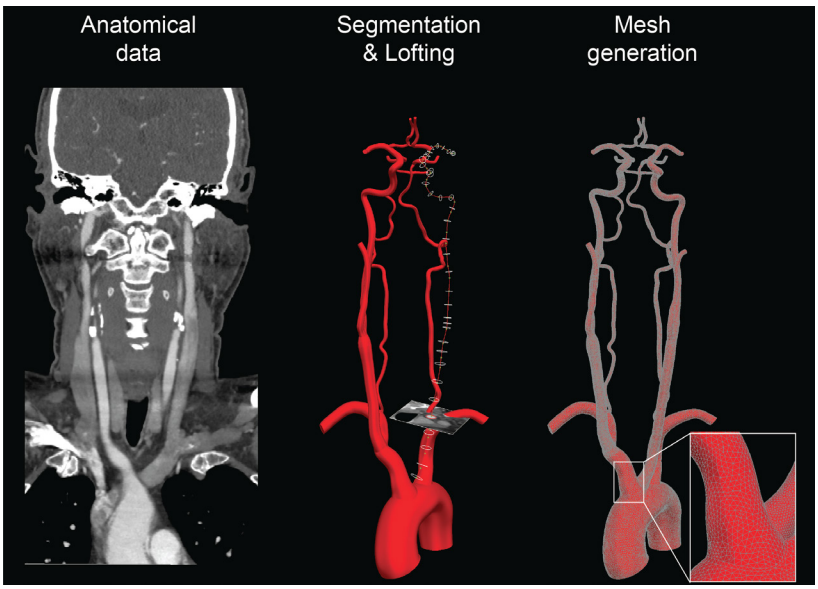

Figure S1 3D reconstruction of the large arteries from the aortic root to the CoW. Based on anatomical data (CTA/MRA), vessels were segmented by defining centerlines and 2D vessel contours for each vessel of interest. The vessel contours were then lofted to create an analytical representation of the vasculature. Finally, the 3D models were meshed using linear tetrahedral elements. CoW, Circle of Willis; CTA, computed tomography angiography; MRA, magnetic resonance angiography.

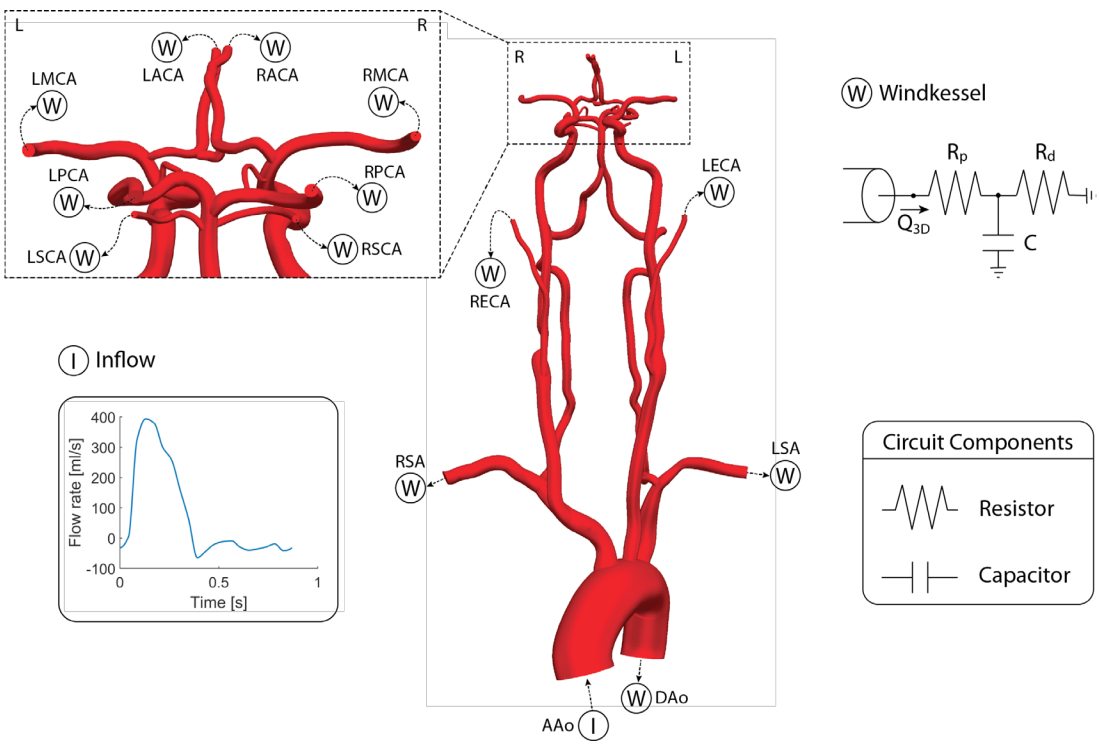

Figure S2 Specification of inflow and outflow boundary condition. A volumetric flow waveform based on PC-MRI measurements was prescribed at the inflow (I) at the ascending aorta (AAo). Each outflow was coupled to a 3-element Windkessel lumped parameter model consisting of a proximal resistance (R_p), distal resistance (R_d), and compliance (C). RACA/LACA, right/left anterior cerebral artery; RMCA/LMCA, right/left middle cerebral artery; RPCA/LPCA, right/left posterior cerebral artery; RSCA/LSCA, right/left superior cerebellar artery; RECA/LECA, right/left external carotid artery; RSA/LSA, right/left subclavian artery; DAo, descending aorta.

https://dx.doi.org/10.21037/qims-22-565

Table S1 Calibrated 3-element Windkessel model parameters, including proximal resistance R_p ($10^9 Pas\ m^{-3}$), distal resistance R_d ($10^9 Pas\ m^{-3}$), and compliance C ($10^9 m^3 Pa^{-1}$)

Outlet	Patient 1 (pre-op)			Patient 2 (pre-op)			Patient 2 (post-op)		
	R_p	R_d	C	R_p	R_d	C	R_p	R_d	C
Descending Aorta	0.01	0.23	63.72	0.01	0.26	54.52	0.01	0.27	50.64
R. subclavian	0.13	2.68	5.50	0.17	3.24	4.43	0.17	3.25	4.14
L. subclavian	0.13	2.63	5.50	0.17	3.24	4.43	0.17	3.25	4.14
RECA	0.49	5.69	2.44	0.42	4.90	2.89	0.41	4.73	2.81
LECA	0.85	10.01	1.42	0.64	7.46	1.89	0.63	7.23	1.84
RACA	2.38	2.38	2.09	4.72	8.01	1.18	5.21	9.68	0.92
LACA	2.11	2.11	2.42	5.76	6.23	1.26	4.60	6.89	1.20
RMCA	0.15	1.55	5.31	2.10	3.54	2.76	2.03	3.77	2.46
LMCA	1.27	1.27	5.60	2.61	2.83	2.86	1.91	2.87	2.93
RPCA	4.22	4.57	1.62	7.51	12.63	0.77	5.96	11.07	0.84
LPCA	4.37	4.73	1.55	8.61	9.33	0.86	6.31	9.46	0.88
RSCA	1.32	14.59	0.91	6.11	15.79	0.69	1.96	21.35	0.59
LSCA	1.32	14.03	0.91	6.14	15.85	0.69	1.96	21.43	0.59
Terminal RVA	–	–	–	7.09	17.09	0.61	3.88	21.97	0.53

RECA/LECA, right/left external carotid artery; RACA/LACA, right/left anterior cerebral artery; RMCA/LMCA, right/left middle cerebral artery; RPCA/LPCA, right/left posterior cerebral artery; RSCA/LSCA, right/left superior cerebellar artery; RVA, right vertebral artery.

https://dx.doi.org/10.21037/qims-22-565