

**Supplementary Data**

Table S1. Segmental WSS<sub>peak</sub> distribution along the aortic circumference (segments 1 - 12) for each patient group and the three aortic levels S1 (sinutubular junction), S2 (mid-ascending aorta) and S3 (distal ascending aorta)

	1	2	3	4	5	6	7	8	9	10	11	12
<b>S1</b>												
<b>Controls</b>	0.9 ± 0.4	0.8 ± 0.3	0.8 ± 0.3	0.7 ± 0.3	0.7 ± 0.2	0.7 ± 0.3	0.7 ± 0.2	0.8 ± 0.2	0.7 ± 0.2	0.8 ± 0.3	0.9 ± 0.4	1.0 ± 0.5
<b>Autograft</b>	0.5 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.5 ± 0.2	0.5 ± 0.1	0.4 ± 0.1	0.5 ± 0.2	0.5 ± 0.2	0.4 ± 0.1	0.5 ± 0.2	0.6 ± 0.2
<b>Mechanical</b>	0.7 ± 0.4	0.8 ± 0.6	0.6 ± 0.4	0.7 ± 0.3	0.8 ± 0.4	0.9 ± 0.5	0.8 ± 0.4	0.8 ± 0.3	0.9 ± 0.3	0.9 ± 0.4	0.7 ± 0.3	0.6 ± 0.3
<b>Stentless bio</b>	0.6 ± 0.3	0.6 ± 0.4	0.5 ± 0.4	0.6 ± 0.3	0.6 ± 0.5	0.7 ± 0.4	0.6 ± 0.3	0.5 ± 0.4	0.6 ± 0.3	0.5 ± 0.3	0.5 ± 0.2	0.6 ± 0.2
<b>Stented bio</b>	0.7 ± 0.4	0.7 ± 0.5	0.7 ±	0.7 ± 0.5	0.7 ± 0.5	0.7 ± 0.4	0.6 ± 0.3	0.6 ± 0.4	0.6 ± 0.3	0.6 ± 0.3	0.5 ± 0.3	0.6 ± 0.2
<b>S2</b>												
<b>Controls</b>	0.8 ± 0.2	0.7 ± 0.2	0.7 ± 0.1	0.7 ± 0.2	0.9 ± 0.2	0.9 ± 0.3	0.9 ± 0.3	0.9 ± 0.4	0.9 ± 0.4	0.7 ± 0.2	0.9 ± 0.2	0.9 ± 0.2
<b>Autograft</b>	0.6 ± 0.2	0.6 ± 0.2	0.6 ± 0.2	0.6 ± 0.3	0.6 ± 0.2	0.6 ± 0.1	0.6 ± 0.1	0.6 ± 0.1	0.6 ± 0.2	0.6 ± 0.1	0.5 ± 0.2	0.6 ± 0.3
<b>Mechanical</b>	0.7 ± 0.4	0.9 ± 0.5	0.9 ± 0.5	0.7 ± 0.4	0.7 ± 0.3	0.7 ± 0.4	0.6 ± 0.2	0.6 ± 0.2	0.6 ± 0.2	0.6 ± 0.3	0.6 ± 0.3	0.7 ± 0.3
<b>Stentless bio</b>	1.1 ± 0.5	1.2 ± 0.5	1.3 ± 0.7	1.2 ± 0.6	1.0 ± 0.4	0.7 ± 0.3	0.6 ± 0.3	0.6 ± 0.3	0.7 ± 0.4	0.7 ± 0.4	0.7 ± 0.4	0.9 ± 0.4
<b>Stented bio</b>	1.0 ± 0.4	1.2 ± 0.5	1.4 ± 0.7	1.4 ± 0.8	1.0 ± 0.6	0.7 ± 0.4	0.5 ± 0.4	0.6 ± 0.5	0.6 ± 0.4	0.6 ± 0.3	0.7 ± 0.3	0.8 ± 0.5
<b>S3</b>												
<b>Controls</b>	0.7 ± 0.1	0.7 ± 0.2	0.8 ± 0.1	0.8 ± 0.2	0.9 ± 0.2	0.9 ± 0.3	0.9 ± 0.3	0.9 ± 0.3	0.8 ± 0.3	0.8 ± 0.1	0.7 ± 0.1	0.7 ± 0.1
<b>Autograft</b>	0.6 ± 0.2	0.6 ± 0.2	0.6 ± 0.2	0.6 ± 0.3	0.5 ± 0.2	0.6 ± 0.3	0.6 ± 0.1	0.6 ± 0.3	0.6 ± 0.3	0.5 ± 0.2	0.5 ± 0.3	0.5 ± 0.2

<b>Mechanical</b>	0.6 ± 0.3	0.7 ± 0.4	0.7 ± 0.4	0.6 ± 0.2	0.6 ± 0.2	0.7 ± 0.3	0.7 ± 0.3	0.7 ± 0.3	0.6 ± 0.3	0.7 ± 0.2	0.6 ± 0.2	0.5 ± 0.2
<b>Stentless bio</b>	0.9 ± 0.6	1.1 ± 0.5	1.1 ± 0.6	0.9 ± 0.4	0.8 ± 0.4	0.8 ± 0.4	0.8 ± 0.3	0.6 ± 0.3	0.6 ± 0.3	0.7 ± 0.4	0.6 ± 0.4	0.7 ± 0.4
<b>Stented bio</b>	1.2 ± 0.7	1.1 ± 0.6	0.9 ± 0.5	0.8 ± 0.4	0.6 ± 0.3	0.6 ± 0.2	0.6 ± 0.3	0.6 ± 0.3	0.6 ± 0.3	0.7 ± 0.4	0.9 ± 0.6	1.0 ± 0.6

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Table S2. Comparison of  $WSS_{peak}$  between groups. For each aortic segment (1-12) on each aortic level (S1-S3),  $WSS_{peak}$  was compared between all groups using a Kruskal-Wallis test. If this indicated significance, individual group-to-group tests by Mann-Whitney were performed. The table shows the p-values of these group-to-group tests and highlights the significant results (\*).

	<b>Autograft</b>	<b>Mechanical</b>	<b>Stentless bio</b>	<b>Stented bio</b>
<b>Level S1, Segment 7</b>				
<b>Controls</b>	0.156	0.825	0.249	0.078
<b>Autograft</b>	---	0.039 *	0.247	0.156
<b>Mechanical</b>	---	---	0.248	0.208
<b>Stentless bio</b>	---	---	---	0.838
<b>Level S1, Segment 8</b>				
<b>Controls</b>	0.010 *	0.825	0.211	0.027 *
<b>Autograft</b>	---	0.003 *	0.908	0.233
<b>Mechanical</b>	---	---	0.102	0.010 *
<b>Stentless bio</b>	---	---	---	0.539
<b>Level S1, Segment 9</b>				
<b>Controls</b>	0.017 *	0.122	0.178	0.378
<b>Autograft</b>	---	0.004 *	0.563	0.296
<b>Mechanical</b>	---	---	0.102	0.038 *
<b>Stentless bio</b>	---	---	---	0.733
<b>Level S2, Segment 2</b>				
<b>Controls</b>	0.125	0.402	0.054	0.004 *
<b>Autograft</b>	---	0.223	0.008 *	0.004 *
<b>Mechanical</b>	---	---	0.290	0.166
<b>Stentless bio</b>	---	---	---	0.682
<b>Level S2, Segment 3</b>				
<b>Controls</b>	0.081	0.691	0.027 *	0.017 *
<b>Autograft</b>	---	0.315	0.008 *	0.005 *
<b>Mechanical</b>	---	---	0.211	0.089
<b>Stentless bio</b>	---	---	---	0.539

<b>Level S2, Segment 4</b>				
<b>Controls</b>	0.315	0.825	0.068	0.059
<b>Autograft</b>	---	0.491	0.028 *	0.030 *
<b>Mechanical</b>	---	---	0.054	0.068
<b>Stentless bio</b>	---	---	---	0.682
<b>Level S3, Segment 5</b>				
<b>Controls</b>	0.004 *	0.019 *	0.564	0.006 *
<b>Autograft</b>	---	0.791	0.247	0.881
<b>Mechanical</b>	---	---	0.441	0.378
<b>Stentless bio</b>	---	---	---	0.335
<b>Level S3, Segment 7</b>				
<b>Controls</b>	0.007 *	0.070	0.290	0.003 *
<b>Autograft</b>	---	0.958	0.355	0.263
<b>Mechanical</b>	---	---	0.847	0.378
<b>Stentless bio</b>	---	---	---	0.172

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