The Transition from Custom-Made to Standardized Multi-Branched Thoracoabdominal Aortic Stent Grafts

Timothy A. Chuter, MD, Ki-Hyuk Park, MD, Jade S. Hiramoto, MD and Linda M. Reilly, MD

UCSF, San Francisco, CA, Daegu, Korea, Republic of and San Francisco, CA

Objective: To compare the branch morphology and short-term outcome of endovascular aneurysm repair using custom-made versus standardized multi-branched thoracoabdominal stent grafts.

Methods: Custom-made stent grafts (CSG) with patient-specific cuff locations were compared to standardized stent grafts (SSG) with uniform cuff locations. Data on patient demographics, aortic morphology, component use, and outcome were collected prospectively. Final branch length (cuff to target artery orifice) and branch angle (cuff orientation to target artery orientation) were determined using 3-D reconstruction of computed tomographic angiograms (CTA).

Results: Since 1/2008, 24 patients underwent endovascular repair using 13 CSG (10 in 2008, 3 in 2009) and 11 SSG (1 in 2008, 10 in 2009). 2 SSG were excluded from analysis: one has yet to undergo CTA, the other had crossed renal branches due to problems traversing a previously reconstructed aortic arch. All stent grafts were implanted successfully. There were no perioperative deaths. All branches were patent on the initial postoperative CTA. There were no statistically significant differences between the CSG and SSG groups in terms of patient demographics, procedural details (operation length, fluoroscopy time, contrast volume, blood loss), or mean branch length and angle (Table 1).

Conclusions: The substitution of SSG for CSG had no effect on the complexity of the procedure, the final branch morphology, or the perioperative outcome. The availability of an off-the-shelf SSG will broaden the application of endovascular TAAA repair by eliminating manufacturing delays.

<table>
<thead>
<tr>
<th>Target Artery</th>
<th>Mean Branch Angle (degrees)</th>
<th>Mean Branch Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSG (sd)</td>
<td>SSG (sd)</td>
</tr>
<tr>
<td>CA (n=23)</td>
<td>14.5 (13.3)</td>
<td>20.4 (11.2)</td>
</tr>
<tr>
<td>SMA (n=25)</td>
<td>25.6 (18.5)</td>
<td>17.3 (17.8)</td>
</tr>
<tr>
<td>RRA (n=21)</td>
<td>25.3 (19.9)</td>
<td>25.0 (14.6)</td>
</tr>
<tr>
<td>LRA (n=21)</td>
<td>26.1 (23.0)</td>
<td>28.7 (25.0)</td>
</tr>
<tr>
<td>All (n=85)</td>
<td>22.8 (18.5)</td>
<td>22.8 (17.6)</td>
</tr>
</tbody>
</table>

Table 1. Comparison of branch morphology between custom-made and standardized stent grafts.