How To Take Care Of The False Lumen In Chronic Aortic Dissection

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Disclosures

- Consultant: Cook Medical, Philips, Getinge, Terumo Aortic, Arterica, Medyria
- Research-grants: Cook Medical, Philips, Terumo Aortic, Medtronic
- Travel-grants: Cook Medical, Getinge proctoring speaking-fees,
- Speaking fees: Cook Medical, Philips, Getinge
- Shares: Mokita-Medical, Arterica, Medyria, Siemens, Philips
- IP: Cook Medical, Terumo Aortic, Mokita Medical
- Royalties: Cook Medical, Terumo Aortic
Failure to Remodel in Chronic Dissection

- Perfusion and pressure unchanged in false lumen
- Presence of Intercostals originating from false lumen
- False lumen back flow to Intercostals
- FL-TAA in 1/3 of TEVAR-patients!

Roselli et al. 2011, Ann Thorac Surg 92: 2078-84
Preoperative thoracic false lumen branches are predictors of aortic enlargement after stent grafting for DeBakey IIIb aortic dissection

Feng Liu, MD, Yang Yang Ge, MD, Wei Guo, MD, Xiao Ping Liu, MD, Xin Jia, MD, Jiang Xiong, MD, and Xiao Hui Ma, MD

<table>
<thead>
<tr>
<th>Group A (preoperative TFLBs ≥8)</th>
<th>Group B (Preoperative TFLBs &lt;8)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaging follow-up period, median (IQR) mo (N)</td>
<td>11.8 (4.5-27.9) (28)</td>
<td>12.2 (4.3-25.1) (39)</td>
</tr>
<tr>
<td>6 ± 3 mo, % (n/N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partially thrombosed</td>
<td>67.9 (19/28)</td>
<td>25.6 (10/39)</td>
</tr>
<tr>
<td>Completely thrombosed</td>
<td>32.1 (9/28)</td>
<td>74.4 (29/39)</td>
</tr>
<tr>
<td>12 ± 3 mo, % (n/N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partially thrombosed</td>
<td>52.6 (10/19)</td>
<td>11.5 (3/26)</td>
</tr>
<tr>
<td>Completely thrombosed</td>
<td>47.4 (9/19)</td>
<td>88.5 (23/26)</td>
</tr>
<tr>
<td>24 ± 6 mo, % (n/N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partially thrombosed</td>
<td>60.0 (6/10)</td>
<td>13.3 (2/15)</td>
</tr>
<tr>
<td>Completely thrombosed</td>
<td>40.0 (4/10)</td>
<td>86.7 (13/15)</td>
</tr>
</tbody>
</table>
Coils, Plugs, Glue

Preop. CT

Intervention

Postop. CT
False Lumen Occlusion Techniques

Candy-Plug

Knickerbocker
Candy-Plug Follow-up

February 2016

July 2016
Cook Candyplug

22mm AVP
sm Candyplug 2012

22mm ZIP
CMD Candyplug I 2013

CMD Candyplug II 2017

CMD Candyplug III 2019
The Candy-Plug Technique: Technical Aspects and Early Results of a New Endovascular Method for False Lumen Occlusion in Chronic Aortic Dissection

Fiona Rohlfss, MD\textsuperscript{1}, Nikolaos Tsilimparis, MD\textsuperscript{1}, Beatrice Fiorucci, MD\textsuperscript{1,2}, Franziska Heidemann, MD\textsuperscript{1}, Eike Sebastian Debus, MD, PhD\textsuperscript{1}, and Tilo Kölbl, MD, PhD\textsuperscript{1}

Table 2. Development of Thoracic Aneurysm Diameters\textsuperscript{1} in 10 Patients With >6-Month Follow-up.\textsuperscript{2}

<table>
<thead>
<tr>
<th>Patient</th>
<th>Follow-up, mo</th>
<th>Postoperative Measurement, mm</th>
<th>Most Recent Measurement, mm</th>
<th>Aneurysm Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>45</td>
<td>35</td>
<td>Remodeling</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>64</td>
<td>59</td>
<td>Remodeling</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>111</td>
<td>91</td>
<td>Remodeling</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>69</td>
<td>72</td>
<td>Stable</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>72</td>
<td>72</td>
<td>Stable</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>62</td>
<td>60</td>
<td>Stable</td>
</tr>
<tr>
<td>7</td>
<td>16</td>
<td>69</td>
<td>64</td>
<td>Remodeling</td>
</tr>
<tr>
<td>8</td>
<td>19</td>
<td>95</td>
<td>81</td>
<td>Remodeling</td>
</tr>
<tr>
<td>9</td>
<td>21</td>
<td>64</td>
<td>55</td>
<td>Remodeling</td>
</tr>
<tr>
<td>10</td>
<td>26</td>
<td>67</td>
<td>38</td>
<td>Remodeling</td>
</tr>
</tbody>
</table>
Candy-Plug in Hamburg

- 2013-2018; N=41
- Technical success 41/41
- No procedural complication
- SCI: 1/41 (2.4%)
- 30d mortality: 1/41 (2.4%)
- 1 death at 5 months
- Reinterventions for continuous perfusion 5/41 (12%)

Unpublished data
Candy-Plug Follow-up

1y postop.
2.5y postop.
1y postop.
2.5y postop.
Candyplug II

Candyplug II
2017
Candyplug II

2017
63y-old male
Chron. TBAD: 10y BMT
Sudden onset of thoracic pain
LSA-Bypass + TEVAR
6.5cm =>7cm => 9cm
TEVAR extension + pmCandy Plug x 2

Courtesy of Andrew Unzeitig, Atlanta
Double Candy Plug

Pre-TEVAR

Pre-Candy Plug

6m Post-Candy Plug

Courtesy of Andrew Unzeitig, Atlanta
Other Candyplugs

Bolton CMD-Candyplug

Courtesy of Dr. M Youssef, University of Mainz

Gore sm-Candyplug

Ogawa et al. 2016; J Endovasc Ther 23:482-6

Medtronic sm-Candyplug

Courtesy of Prof. I-Hui Wu, National Taiwan University

Gore/Cook sm-Candyplug

Knickerbocker in Hamburg

- 2013-2016; N=15
- Technical success 14/15
- No complications
- No 30d mortality
- No SCI
- 4 reinterventions for continuous perfusion
- Secondary FL-thrombosis all patients
Arch-Branch & FL-Occlusion

Chronic TAAD  A-Branch + Knickerbocker  A-Branch + Candy Plug
fEVAR in Chronic Type B
Chronic Dissection Strategy

FL-Aneurysm in CAD
Chronic Dissection Strategy

- FL-Aneurysm in CAD
- TEVAR to the Celiac
Chronic Dissection Strategy

- FL-Aneurysm in CAD
- TEVAR to the Celiac
- + FL-Occlusion
Chronic Dissection Strategy

- FL-Aneurysm in CAD
- TEVAR to the Celiac
- + FL-Occlusion
Chronic Dissection Strategy

1. FL-Aneurysm in CAD
2. TEVAR to the Celiac
3. + FL-Occlusion
4. Fen/Branch EVAR
Chronic Dissection Strategy

- FL-Aneurysm in CAD
- TEVAR to the Celiac
- + FL-Occlusion
- Fen/Branch EVAR
Chronic Dissection Strategy

FL-Aneurysm in CAD

TEVAR to the Celiac

+ FL-Occlusion

Fen/Branch EVAR

+ FL-Occlusion
False lumen backflow limits treatment success in chronic TBAD.

Techniques for false-lumen embolisation work:
- Plugs, coils, glue
- Candy-plug
- Knickerbocker-technique

We need an off-the-shelf device
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University Heart & Vascular Center Hamburg

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  - Ascending aorta
  - Aortic arch
  - Thoracoabdominal aorta
  - Aortoiliac disease

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