Carotid Stenting – How to properly select suitable Patients

Stephan Duda
Carotid Stenting – How to not select unsuitable Patients

Stephan Duda
Disclosure

Speaker name: S. Duda

I have the following potential conflicts of interest to report:

- [ ] Consulting
- [ ] Employment in industry
- [ ] Stockholder of a healthcare company
- [ ] Owner of a healthcare company
- [ ] Other(s)

- [x] I do not have any potential conflict of interest
### Table 3  Conditions associated with increased procedural risk and contraindications for carotid artery stenting

**Increased risk**
- Age $\geq 80$ years
- Symptomatic ICA lesion
- Severe renal insufficiency
- Severely diseased and/or steep aortic arch
- Severely diseased and/or tortuous CCA
- Severely diseased and/or tortuous distal ICA
- Long subtotal ICA occlusion (string sign)
- Poor femoral access
- Major stroke within 4–6 weeks
- Extensive intracranial microvascular disease

**Contraindications**
- Intolerance to aspirin and/or clopidogrel
- Circumferential ICA calcification
- Intraluminal thrombus
- Chronic ICA occlusion
- Intracranial aneurysm or AVM requiring treatment

CCA, common carotid artery; ICA, internal carotid artery; AVM, arteriovenous malformation.
### CAS: Impact of Technical and Anatomical Factors

<table>
<thead>
<tr>
<th>Anatomical factors</th>
<th>N Studies</th>
<th>N Patients</th>
<th>Pooled RR (95% CI)</th>
<th>Pooled RR (95% CI)</th>
<th>I²(%)</th>
<th>P(Het)</th>
<th>P(Sig)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type III aortic arch</td>
<td>2</td>
<td>488</td>
<td>1.82 [0.97 - 3.41]</td>
<td></td>
<td>0</td>
<td>0.81</td>
<td>0.06</td>
</tr>
<tr>
<td>Left vs. right side</td>
<td>5</td>
<td>9384</td>
<td>1.29 [1.05 - 1.58]</td>
<td></td>
<td>27</td>
<td>0.24</td>
<td>0.02</td>
</tr>
<tr>
<td>Increased ICA-CCA angulation</td>
<td>2</td>
<td>406</td>
<td>3.41 [1.52 - 7.63]</td>
<td></td>
<td>45</td>
<td>0.18</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Aortic arch calcification</td>
<td>2</td>
<td>341</td>
<td>1.80 [0.74 - 4.37]</td>
<td></td>
<td>22</td>
<td>0.26</td>
<td>0.19</td>
</tr>
<tr>
<td>Contralateral ICA occlusion</td>
<td>8</td>
<td>4050</td>
<td>0.83 [0.48 - 1.44]</td>
<td></td>
<td>0</td>
<td>0.88</td>
<td>0.50</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Target stenosis</th>
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<th></th>
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<tbody>
<tr>
<td>Lesion length &gt;10mm</td>
<td>3</td>
<td>634</td>
<td></td>
<td>2.36 [1.28 - 3.38]</td>
<td>14</td>
<td>0.31</td>
<td>0.01</td>
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<tr>
<td>Calcification</td>
<td>5</td>
<td>1334</td>
<td></td>
<td>1.62 [0.99 - 2.64]</td>
<td>0</td>
<td>0.67</td>
<td>0.05</td>
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<tr>
<td>Ostial location</td>
<td>2</td>
<td>781</td>
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<td>1.75 [0.99 - 3.11]</td>
<td>0</td>
<td>0.54</td>
<td>0.06</td>
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<tr>
<td>Stenosis ≥90% (NASCET)</td>
<td>5</td>
<td>4547</td>
<td></td>
<td>1.29 [0.64 - 2.58]</td>
<td>71</td>
<td>0.01</td>
<td>0.88</td>
</tr>
<tr>
<td>Ulceration</td>
<td>3</td>
<td>906</td>
<td></td>
<td>1.73 [0.64 - 4.69]</td>
<td>54</td>
<td>0.11</td>
<td>0.15</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical factors</th>
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</thead>
<tbody>
<tr>
<td>Cerebral protection</td>
<td>23</td>
<td>15702</td>
<td></td>
<td>0.55 [0.41 - 0.73]</td>
<td>41</td>
<td>0.02</td>
<td>&lt;0.001</td>
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<tr>
<td>Closed vs. open cells stent</td>
<td>4</td>
<td>4830</td>
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<td>0.80 [0.47 - 1.37]</td>
<td>56</td>
<td>0.08</td>
<td>0.15</td>
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<tr>
<td>Filter vs. balloon</td>
<td>3</td>
<td>3987</td>
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<td>0.88 [0.45 - 1.71]</td>
<td>0</td>
<td>0.84</td>
<td>0.71</td>
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<tr>
<td>Eccentric vs. concentric filter</td>
<td>3</td>
<td>3253</td>
<td></td>
<td>1.64 [0.71 - 3.76]</td>
<td>0</td>
<td>0.45</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Possible Contraindications

- Difficult aortic arch
  - Kinked ICA
  - Thrombus
- Extreme calcification
Arch Morphology

Type I

Type II

Type III

1-2 diameter of CCA

> 2 diameter of CCA
Arch Morphology
Hostile Aortic Arch

8F Cordis Simmonds (sidewinder) II configurated introducer guide (Cordis)
Relative Contraindications against CAS

Aneurysm of CCA

Acute Offspring of LCCA

Coarctation
Relative Contraindications against CAS

Aneurysm of ICA
Limitations of CAS

Kinking
90° Angle
No more Contraindication to CAS
„Near Occlusion with Collapse“
No more Contraindication to CAS „Near Occlusion w/o Collapse“
Absolute Contraindications

- Extreme arch atherothrombosis
- Unpassable aortic arch
- Kinked ICA near lesion
- Extreme calcification
Thank you
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