Carotid artery stenting for complicated patients

Yongquan Gu  M.D.

Vascular Surgery Department of Xuanwu Hospital，CMU
Vascular Surgery Institute of CMU
Disclosure

Speaker name:
Yongquan Gu

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)

☒ I do not have any potential conflict of interest
Complicated patients for CAS?

- Risk factors for stroke of CAS
  - patient status
  - lesion characteristics
  - anatomy
  - operator’s experience

Stroke.2010;41;1259
How to do CAS safely in high-risk patients?

• Optimized individualized treatment!
  – Appropriate Patient selection
  – Suitable instruments selection
  – Improve Operating skills
CAS Patient selection

- **Symptomatic carotid stenosis**
  - US ≥70% or DSA≥50%

- **Class IIb**
  - Asymptomatic carotid stenosis
    - DSA ≥ 60% or US ≥ 70%

- **Class IIa**
  - CAS as first choice for patients anatomically not suitable for CEA
High risk factors for CAS

- **Patient-related variables:**
  - Age
  - Cardiac disease
  - Renal insufficiency
  - Presence of neurological symptoms
  - Smoker
  - Hypertension
  - Diabetes
  - Peripheral arterial disease
  - Hypercholesterolemia

Optimize medical control!
High risk CAS

• Operation-related:
  – Aortic arch (type II, III, Bovine arch)
  – Carotid tortuosity
  – Calcified lesion
  – Plaque property
  – Contralateral occlusion

Reasonable instruments and skills
Adjusting projection angle
# Stent selection

<table>
<thead>
<tr>
<th>Stent (Manufacturer)</th>
<th>Design</th>
<th>Cell Type</th>
<th>Material</th>
<th>Shape</th>
<th>Free Cell Area, mm²</th>
<th>Tapering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carotid Wallstent Monorail (Boston Scientific)</td>
<td>Woven</td>
<td>Closed</td>
<td>Cobalt chromium</td>
<td>Tube</td>
<td>1.08</td>
<td>Self-tapering</td>
</tr>
<tr>
<td>Exponent RX (Medtronic Vascular)</td>
<td>Laser-cut</td>
<td>Open</td>
<td>Nitinol</td>
<td>Tube</td>
<td>6.51</td>
<td>Self-tapering</td>
</tr>
<tr>
<td>NexStent Monorail (Boston Scientific)</td>
<td>Laser-cut</td>
<td>Closed</td>
<td>Nitinol</td>
<td>Coiled sheet</td>
<td>4.7</td>
<td>Self-tapering</td>
</tr>
<tr>
<td>Precise (Cordis)</td>
<td>Laser-cut</td>
<td>Open</td>
<td>Nitinol</td>
<td>Tube</td>
<td>5.89</td>
<td>Self-tapering</td>
</tr>
<tr>
<td>Protégé RX (ev3)</td>
<td>Laser-cut</td>
<td>Open</td>
<td>Nitinol</td>
<td>Tube</td>
<td>10.71</td>
<td>Straight or shoulder-tapered</td>
</tr>
<tr>
<td>RX Acculink (Guidant/Abbott Vascular)</td>
<td>Laser-cut</td>
<td>Open</td>
<td>Nitinol</td>
<td>Tube with longitudinal spines</td>
<td>11.48</td>
<td>Straight or conical-tapered</td>
</tr>
<tr>
<td>Xact (Abbott Vascular)</td>
<td>Laser-cut</td>
<td>Closed</td>
<td>Nitinol</td>
<td>Tube</td>
<td>2.74</td>
<td>Straight or conical-tapered</td>
</tr>
</tbody>
</table>

![Stent Images](image1)
Closed-cell stent
Open cell stent
## EPD selection

<table>
<thead>
<tr>
<th>Filter (Stent)*</th>
<th>Characteristics</th>
<th>Pore Size, $\mu$m</th>
<th>Lesion-Crossing Profile, French</th>
<th>Available Filter Diameters, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accunet (Acculink)</td>
<td>Concentric</td>
<td>125</td>
<td>3.5–3.7</td>
<td>4.5, 5.5, 6.5, 7.5</td>
</tr>
<tr>
<td>ANGIOGUARD (Precise)</td>
<td>Concentric</td>
<td>100</td>
<td>3.2–3.9</td>
<td>4, 5, 6, 7, 8</td>
</tr>
<tr>
<td>EmboShield (Xact)</td>
<td>Concentric, bare wire</td>
<td>120</td>
<td>2.8–3.2</td>
<td>Small, 2.5–4.8 Large, 4–7</td>
</tr>
<tr>
<td>FilterWire EZ (NexStent)</td>
<td>Eccentric</td>
<td>110</td>
<td>3.2</td>
<td>One size fits all</td>
</tr>
<tr>
<td>SpiderRX (Protégé)</td>
<td>Eccentric</td>
<td>Variable</td>
<td>3.2</td>
<td>3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>FiberNet (several commercially available stents)</td>
<td>Occluder + filter</td>
<td>40</td>
<td>2.4–2.9</td>
<td>3.5–7.0</td>
</tr>
</tbody>
</table>
Proper EPD selection and deployment
99% stenosis

- Proximal protection balloon when willis’ circle's open
- Predilation+ low-profile EPD when willis’ circle's not open
Pre-dilatation or post-dilatation

Post dilatation of a low-echo plaque!
Difficult anatomy of arch

Proper access and instruments selection
Case: Bovine Arch
L-ICA Stenosis
General Anesthesia,
Right brachial access; CAS

5F Cobra catheter

6F long shenth
Summary

• CAS for complicated patients should be optimized and individualized according to anatomic, lesion-related, patient-related condition.
Thank you!
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