Step by step: Carotid stenting – Dos and Don’ts

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Carotid artery stenting is an advanced endovascular procedure...

.... but some rules on dos and don’ts can make it easier
The entire CAS team should have:
1. in-depth knowledge of the carotid pathology
2. in-depth knowledge of the materials
3. in-depth knowledge of techniques to apply in given situations.
• Clinical protocol
• CAS technique
  – Vascular access
  – Angiographic evaluation
  – Common carotid engagement
  – Crossing the stenosis
  – EPD management
  – Pre-dilatation
  – Stent selection and deployment
  – Post-dilatation
• Final angiographic evaluation
**Clinical protocol**

- **Pre meds**
  - ASA 100 mg PO
  - Clopiogrel 75 mg/die, or Ticagrerol 180 mg/die

  ![Image of pill]

  - Double anti-platelet aggregation
  - 1 month
  - $t_0$: procedure

  ![Timeline diagram]
Clinical protocol

- Pre procedure
  - Echo-Doppler, CT / MRI
  - Independent neuro evaluation
  - Procedure consent signed
Clinical protocol

Don’ts

To operate on patients without

- double antiplatelet therapy (full regimen)
- anatomical evaluation of epiaortic vessels
Carotid Artery Stenting
Step-by-step

• Clinical protocol
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Carotid Artery Stenting
Step-by-step

• Clinical protocol

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Common carotid engagement

Base the selection of your materials and techniques on the anatomy
Common carotid engagement

“Telescopic approach” with long shuttle sheath

“Direct technique” with guiding catheter
Accessing the CCA

Impact of diagnostic catheter

Berenstein

Vitek, Sidewinder

Vertebral (VER) or Multipurpose or JR 4, 100cm!

4 – 5 F
“Telescopic approach” with long shuttle sheath

Look for a smooth transition and advancement into the CCA
“Direct technique” with guiding catheter

Bovine Arch

Hockey Stick 1,2,3
Guiding catheter (steerable device)

- Steerable device
- Direct engagement
- No touch the bifurcation
- Co-axial technique

0.035 GW
6F coaxial catheter
8F pre-shaped GC
When the standard methods fail
1. identify the potential reasons for failure of the standard technique
2. then to adopt an alternative strategy with further devices to minimize the embolic risk
If you think that the support of a guiding catheter may be not enough………

We can leave the guiding catheter at level of aortic arch and ……
Simple Trick:
“buddy wire” in the external carotid artery

Pre dilatation

Stenting

Post dilatation
When the use of Guiding Catheter is mandatory

Multi-purpose 40°
Simple Trick:
use more than one 0.035” wire

Multi-purpose 40°

Vascular and Endovascular Surgery Unit - University of Siena
Simple Trick:
use more than one 0,035” wire
Carotid Artery Stenting Step-by-step

• Clinical protocol
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• Final angiographic evaluation
Pre-dilatation

- only in the case of very tight (pre-occlusive) stenosis

- if associated with heavily calcified lesions (cutting balloon angioplasty - 4-5/10mm) inflated to no more than 6-8 bars.
Which stent?

- Wallstent (BSCI)
- Adapt (BSCI)
- Precise (Cordis)
- Acculink (Abbott)

Closed cell

Open cell
**Objectives**

To evaluate the rate of:

- stent malapposition
- plaque prolapse
- fibrous cap rupture

OPTICAL COHERENCE TOMOGRAPHY AFTER CAROTID STENTING: RATE OF STENT MALAPPPOSITION, PLAQUE PROLAPSE AND FIBROUS CAP RUPTURE ACCORDING TO STENT DESIGN. *Eur J Vasc Endovasc Surg* 2013;45:579-87
**Design**
Prospective single center study

**Objectives**
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according to carotid stent design


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Results:
Plaque prolapse

<table>
<thead>
<tr>
<th>Plaque prolapse</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed-cell</td>
<td>23.3</td>
</tr>
<tr>
<td>Open-cell</td>
<td>68.6</td>
</tr>
<tr>
<td>Hybrid</td>
<td>30.8</td>
</tr>
</tbody>
</table>

$p<0.05$
New carotid stent design

Terumo - Roadsaver

Gore – Mesh carotid stent

Inspire – C-Guard
New carotid stent design

Terumo Road saver: Double layer micromesh nitinol design
New carotid stent design

Inspire C-Guard: nitinol stent wrapped with an expandable, MicroNet (PET mesh).
Carotid Artery Stenting Step-by-step

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  - Stent selection and deployment
  - Post-dilatation
- Final angiographic evaluation
Flushing maneuvers
Carotid Artery Stenting
Step-by-step

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  - EPD management
  - Pre-dilatation
  - Stent selection and deployment
  - Post-dilatation
- Final angiographic evaluation
- Very gentle, controlled inflation and deflation of balloon catheter
CAS technique

Don’t

- ... be too aggressive in vessel cannulation

- ... have limited device options
  (guidewires; GC/long sheath; filter/Mo.Ma; closed cell/mesh stent/open cell)

- ... think CAS is the only option
Final remark

Of all strategies, knowing when to quit may be the best.

Chinese Proverb
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