Avoiding And Managing Complications During Transfemoral CAS

Step by step

- Patient selection
- Operator selection
- Medication
- Getting access
- Crossing the lesion
- Embolic protection
- Stent implantation
- Post dilatation
- Post stent management

When selecting patients, we should consider:

- General risk factors
  - Comorbidities, age
- Morphologic risk factors
  - Difficult access
  - Iliac tortuosity, aortic arch type III, elongated CCA
  - Lesion morphology
  - Thrombus, large plaque
  - Morphology of the distal ICA
  - Elongation, kinking
  - Contralateral occlusion, isolated hemisphere

Disclosures

<table>
<thead>
<tr>
<th>Physician name</th>
<th>Company</th>
<th>Relationship</th>
</tr>
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<tbody>
<tr>
<td>Horst Sievert</td>
<td>4tech Cardio, Abbott, Ablative Solutions,</td>
<td>Study honoraria to institution, travel expenses, consulting fees to institution</td>
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<td></td>
<td>Ancora Heart, Append Medical, Bavaria Medizin Technologie GmbH, Bioventrix, Boston Scientific, Corning Cardiovascular, Cardimed, Celonova, Comed B.V., Contego, CVRx, Dinovis, Edwards, Endologix, Hemosteg, Hangzhou Nuocna Medtech, Holistick Medical, Lifetech, Medtronic, Mokita, Occlutech, Recor, Renal Guard, Terumo, Vascular Dynamics, Vectorious Medtech, Venock, Venus, Vitesse Medical</td>
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We are the best, of course!

- Because each of us feels like being the best interventionalist in the world
- Those of us who are more critical of course know that all others do feel the same
- But deep in our heart we do believe that we are right and the others are wrong

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Medication

- Discontinue drugs inducing bradycardia
  - β-Blocker, Ca antagonists
- Aspirin + Plavix 1 week before
- Fluids
- Don't treat hypertension before the stent is implanted
- Heparin 5,000-7,500 units
- Atropine before balloon dilatation
  - 0.5-1 mg (repeatedly, if necessary)
  - 3-5 min before balloon inflation

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Complications during access

- Any puncture site complication does increase the risk of post-procedural stent thrombosis and cerebral embolism
  - Pay additional attention to puncture technique!
  - Consider to postpone the procedure if you start with a hematoma
- Catheter manipulation in the aortic arch is an important source of cerebral embolism
  - Use appropriate catheters and techniques
- Avoid air embolism and thromboembolism
  - Always de-air the sheath after introducing something
  - Always flush the sheath when you have blood inside

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Complex Lesion

- Cross carefully
  - Wire should never touch the plaque
  - Not easy because the wire is moving due to the heart beat and respiration
  - Consider prox occlusion

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Avoid malposition of excentric filters

Verify position!!

Malaposition also occurs in concentric filters

- Place the filter in a straight vessel segment
- Avoid over- and undersizing
- Newer filters have improved vessel wall contact

Proximal occlusion devices provide better protection

But be careful with proximal occlusion devices in contralateral occlusion or "isolated hemisphere"
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### Open Cells – Closed Cells – Mesh Stents
- More flexible
- May have better plaque coverage
- No randomized trials – but very good data supporting mesh stents

### Post-Dilatation
- Atropine already should has been given
- Balloon
  - 20-40 mm long
  - Balloon diameter not more than than diameter of ICA
- Nominal pressure
- Long inflation, if tolerated

### Retrieval of embolic protection devices
- Keep away from the stent struts
- If the device can not be retrieved
  - Re-advance and rotate
  - Turn head to the left/right
  - Buddy wire
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Post stent

- Fluids
- Repeated neuro evaluations
- Keep BP as low as possible
- BP ↓ + symptoms → pressors
- Bradycardia → atropin
- Aspirin & plavix for 4 weeks
- FU with duplex

... and if prevention did not work?

- Distal dissection caused by the filter
- Fixed by additional stents

Distal embolisation
Rescue by mechanical recanalization

With all this the complication rate of CAS in many centers is now clearly below 1%
Thank You!

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