Debate:
CEA Must Include Completion Imaging By Duplex Or Angiography

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- In-hospital stroke/death rates decreased
- The use of Local Anaesthesia increased from ~10% to ~30%
- Intraoperative angiography and DUS increased from ~30% to ~50%

Revision rates between 3% and 8%
Different revision criteria
No randomized trials
No data that completion imaging is harmful!

German Carotid Registry
Knappich et al., STROKE 2017; 48: 955-963

- Elective CEA for (as)ymptomatic car sten, > 140,000 cases
- Any in-hospital stroke or death 1.8%
- L.A., antplatelet medication, AND intraoperative completion studies by DUS or angiography were independently associated with lower in-hospital stroke/death rates after CEA

There is some evidence in favour of intraop completion imaging after CEA

What is better? DUS or angiography?
Intraop angiography after CEA

Intraop DUS (VeriQ c, MEDISTIM)

CIDAC – Comparison of Intraop DUS and Angiography (150 pts)

- Angiography: 5-10ml contrast media
- IDUS
  - B-Mode: Transverse scan car bifurcation
  - Longitudinal scans of prox/distal intimal step
- Rating by 3 blinded investigators (different levels of experience)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Definition</th>
<th>Implication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No defect</td>
<td>No operative revision</td>
</tr>
<tr>
<td>2</td>
<td>Minor defect</td>
<td>Consider operative revision</td>
</tr>
<tr>
<td>3</td>
<td>Major defect</td>
<td>Operative revision recommended</td>
</tr>
<tr>
<td>4</td>
<td>Severe lesion</td>
<td>Operative revision mandatory</td>
</tr>
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CIDAC - Results

- Revision rate 9.3%
- Periop stroke/death rate 1.3%

Interrater Reliability (Kendall’s coefficient of concordance Wt)

- Angi: Wt = 0.568
- IDUS: Wt = 0.701

P = 0.003

- IDUS detects more defects after CEA compared to angio (p<0.001)
- Interrater reliability of IDUS is higher than with angiography
CEA Must Include Completion Imaging By DUS Or Angiography

- There is no evidence at all, that completion imaging is harmful!!
- Major technical errors can be corrected immediately
- Valid documentation of the technical result
- DUS seems to be more sensitive and has a higher reproducability

In CAS a final look at the end result is essential

Trust, but verify - doveryai, no proveryai

President Ronald Reagan in the context of nuclear disarmament

Do not trust a vascular surgeon, unwilling to verify the surgical endproduct, if the brain is the target organ

Completion imaging after CEA is a MUST!

It’s not the stenosis... but the brain

Thank you very much

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