Optical Coherence Tomography during Carotid stent procedures: Tips techniques and advantages

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Disclosure's

Speaker name: Suhail Dohad, MD

Consultant/Advisory Board/Research Grants:
- Medtronic
- Abbott Vascular
- AVINGER
- Boston Scientific
- ST Jude Medical

Speaker/Proctor:
- Medtronic Endovascular
- Abbott Vascular
- Boston Scientific
- AVINGER
- St Jude Medical
- Astra Zeneca
- Jansenn Pharmaceuticals
- Sanofi
- Eli Lily

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## CREST peri-procedural stroke

<table>
<thead>
<tr>
<th></th>
<th>Stroke</th>
<th>Major Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS</td>
<td>4.1%</td>
<td>0.9%</td>
</tr>
<tr>
<td>CEA</td>
<td>2.3%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Hazard Ratio</td>
<td>1.79</td>
<td>1.35</td>
</tr>
<tr>
<td>95% Conf. Int.</td>
<td>1.14 – 2.82</td>
<td>0.54 – 3.36</td>
</tr>
<tr>
<td>p-value</td>
<td>0.01</td>
<td>0.52</td>
</tr>
</tbody>
</table>

Majority of peri-procedural stroke is ipsilateral, and within the first 24 hours
Debate

Which patient with asymptomatic severe carotid stenosis is likely to become symptomatic.

Is there a way to distinguish a high risk lesion for embolic events at the time of carotid procedure.

Proximal protection vs distal protection
Carotid stent vs Carotid endarterectomy
Physics aspects and Limits
Plaque characterization

Fibrotic
Attenuation 3.2/mm
Backscattering 6.7/mm

Calcified
Attenuation 1.7/mm
Backscattering 5.4/mm

Lipid
Attenuation 7.5/mm
Backscattering 6.6/mm
Wireless mouse controls all imaging functions for acquisition and review
Injection of Diluted contrast for blood clearing
Large ulcerated plaque
Case impact

- Additional 14 cc of contrast
- Evaluated this fibrotic restenotic lesion without thrombus or calcium
- No post dilation
Case Impact

• Additional 16 cc of contrast
• Symptomatic without fresh thrombus and non circumferential calcifications
• Good pre dilation and post dilation
• Excellent stent coverage
• Modest plaque prolapse
• ? If angiomax should be considered for a few hours post implantation. Different anti platelet regimen
Case Impact

- 16 cc contrast
- Severe symptomatic plaque with fresh thrombus noted
- Treated with excellent post stent result
<table>
<thead>
<tr>
<th></th>
<th>Control (n=57) (mean ± SD)</th>
<th>OCT (n=18) (mean ± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (% male)</td>
<td>61.4%</td>
<td>50%</td>
<td>0.7986</td>
</tr>
<tr>
<td>Age (years)</td>
<td>74.6 ± 8.78</td>
<td>72.1 ± 11.57</td>
<td>0.3779</td>
</tr>
<tr>
<td>History of Acute Neurological Event (%)</td>
<td>71.9%</td>
<td>83.3%</td>
<td>0.1452</td>
</tr>
<tr>
<td>Peripheral Vascular Disease (%)</td>
<td>19.3%</td>
<td>33.3%</td>
<td>0.1372</td>
</tr>
<tr>
<td>Hypertension (%)</td>
<td>63.2%</td>
<td>72.2%</td>
<td>0.2361</td>
</tr>
<tr>
<td>Dyslipidemia (%)</td>
<td>47.4%</td>
<td>61.1%</td>
<td>0.1549</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>26.3%</td>
<td>44.4%</td>
<td>0.0889</td>
</tr>
<tr>
<td>Previous Tobacco Use (%)</td>
<td>3.51%</td>
<td>22.2%</td>
<td>0.0403</td>
</tr>
<tr>
<td>Previous CABG (%)</td>
<td>21.1%</td>
<td>27.8%</td>
<td>0.2894</td>
</tr>
<tr>
<td>Contrast (mL)</td>
<td>87 ± 31.64</td>
<td>101.6 ± 37.64</td>
<td>0.0691</td>
</tr>
<tr>
<td>Fluoroscopy Time (minutes)</td>
<td>25.3 ± 5.04</td>
<td>26.5 ± 5.62</td>
<td>0.8703</td>
</tr>
<tr>
<td>Post Procedural TIA/Stroke</td>
<td>0%</td>
<td>0%</td>
<td>ns</td>
</tr>
<tr>
<td>Post Procedural Creatinine (mg/dL)</td>
<td>25.3 ± 1.04</td>
<td>26.5 ± 0.324</td>
<td>0.4587</td>
</tr>
</tbody>
</table>
Safety and concerns

- We have now done 40 cases over the last 2 years using OCT guidance
- Improved image acquisition as we have modified technique
- Safe with no imaging based complications
- Minimal Increase in dye use and length of procedure
- Flimsy catheter tip and short monorail
Summary

- Excellent noncontroversial images with great definition of plaque with high contrast.
- Modifies Interventional and post Intervention strategy.
- Safe
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