Controversy: Timing of Carotid Endarterectomy

- The most current SVS guidelines recommend that CEA should be performed within 14 days of the neurological event.
- The most current United Kingdom guidelines, however, recommend intervention within 2 days for symptomatic severe carotid stenosis in neurologically stable patients.

High Recurrence Rate During the High Risk Period

- 15-20% rates of recurrence of neurological events in the same cerebral territory have been reported.
  - This risk is not evenly distributed.
- In patients with Carotid artery stenosis:
  1. The recurrence rate is higher.
     - Patients with ≥50% symptomatic ICS have a 100 times greater risk of recurrence of neurological event than those without.*
  2. High risk period lasts longer.

Identifying High Risk Patients for Recurrence

- Many validated models can predict the risk of stroke after neurological events with good concordance.
- The commonalities of these models:
  - Older patients,
  - High degree of peripheral vascular risk factor (e.g., HTN, diabetes, CAD),
  - Presence of peripheral vascular disease (e.g., ICS),
  - Degree of the initial neurological deficit.

Is Very Early (<48 hours) CEA Safe?

- Many studies indicate that very early CEA leads to significant mortality and stroke.
- Few studies indicate that the results are similar between hyperacute phase and later on:
  - Underpowered
  - "...the results did not achieve biostatistical significance”
- In many studies, TIA and stroke patients were combined together.
  - 0-2 Rankin scale in 90.3% of one study
  - Single institution studies.
..combined stroke and mortality rates: 11.5% for <48 hours 3.6% for 3-7 days 4.0% for 8-14 days 5.4% for >15 days

**Days After OR CI P**

<table>
<thead>
<tr>
<th>Days After</th>
<th>OR</th>
<th>CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 day</td>
<td>4.24</td>
<td>2.07-8.70</td>
<td>&lt;0.001</td>
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<tr>
<td>3-7 d</td>
<td>Reference group</td>
<td></td>
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<tr>
<td>8-14 d</td>
<td>1.11</td>
<td>0.62-2.02</td>
<td>0.707</td>
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<td>15-180 d</td>
<td>1.90</td>
<td>1.12-3.22</td>
<td>0.017</td>
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**Study Sample**

Symptomatic CEA

**CEA: Delayed; LOS=“LOS2*”**

**CEA: In-hospital; LOS>“LOS2*” by 1 day**

**Group III:** ≤6

**Group II:** ≤2-5

**Group I:** <2

**EXCLUDED CASES**

*LOS2= days after surgery

**We did some descriptive analysis on the entire group before excluding TIA cases.

**Results: Sample Description and Descriptive Analyses**

- We identified 4076 patients from a total of more than 14,864 cases;
  - 82% Delayed, n=2731
  - 18% Inhospital, n=1345

**Results: Sample Description- In-hospital CEAs**

- We identified 1345 patients who had CEA for symptomatic CEA as inpatients.
  - Of these, 512 (38%) were performed on patients w stroke (=TIA)

**Results: Crude Comparison of Outcomes**

- Stroke and post-op MI are in-hospital events.
  **Any adverse event= 30-d POD/post-op MI/post-op stroke**
Results: Adjusted Comparisons
Mortality

20-day Post-op Mortality

30-day Post-op Mortality

- Post-operative stroke

Conclusions

- CEA performed 2-5 days after event is almost as safe as performed in a delayed fashion.
  - CEA during the hyperacute phase (<48 hours) leads to serious adverse outcomes.
- Ultimately, a carefully constructed prospective randomized trial will help answer the question of best timing of CEA among these patients.