COMBINED CAROTID STENTING AND CARDIAC SURGERY IN THE SAME OPERATING ROOM: PRELIMINARY RESULTS.


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Background

Severe Carotid stenosis in cardiac patients: 12-18%

Stroke incidence in patients with severe ICA stenosis undergoing cardiac surgery: 10-20%
## Operative strategies

**review 2003, Naylor et al**

<table>
<thead>
<tr>
<th></th>
<th>Operative Mortality</th>
<th>Ipsilateral Stroke</th>
<th>Myocardial Infarction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staged</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEA → CABG</td>
<td>3.9%</td>
<td>2.5%</td>
<td>6.5%</td>
<td>12.9%</td>
</tr>
<tr>
<td><strong>Staged</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CABG → CEA</td>
<td>2.0%</td>
<td>5.8%</td>
<td>0.9%</td>
<td>8.7%</td>
</tr>
<tr>
<td><strong>Synchronous</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEA + CABG</td>
<td>4.6%</td>
<td>3.0%</td>
<td>3.6%</td>
<td>11.2%</td>
</tr>
</tbody>
</table>

**CAS?**
Aim of the study:

combining carotid stenting to cardiac surgery helps to improve clinical results?

CAS & Cardiac Surgery

CAS

CEA + Heart Surgery → does it work?
22 patients included

M: 13 (59%)  F: 9 (41%)
Mean age: 70.3 (56-81)

Previous TIA/stroke: 5 (23%)
Bilateral carotid disease: 9 (41%)

EuroScore $\geq 6$: 85%

Stable angina pectoris: 12 (54%)
Unstable angina pectoris: 9 (41%)
Valve disease: 6 (27%)
Previous myocardial infarction: 11 (50%)
EF<40%: 5 (23%)
Our study: CAS & cardiac surgery

Inclusion criteria:  
- coronary and/or cardiac valve disease  
- carotid stenosis > 80% (uni or bilateral)

Exclusion criteria:
- pre-occlusive ICA stenosis or endoluminal thrombus  
- ICA tortuosity precluding distal filter deployment

( Access: cervical ) - severe aortic and epiaortic vessel tortuosity  
(type III arch, bovine arch, CCA coiling or kinking)  
- severe calcification of aortic arch or epiaortic vessels  
- severe aortoiliac occlusive arteriopathy  
- abdominal aortic aneurysm  
- aortobifemoral prosthesis
Operative strategy

• No preoperative anti-platelet drugs
• Systemic heparin bolus (70 UI/Kg) after placement of the introducer sheath
• Combined procedure in the same operating room
• General anesthesia and full invasive cardiac monitoring during CAS
• Double antiplatelet treatment in the early postoperative period (12 hours)
Interventions:

Filter-protected transfemoral CAS: 16 (73%)
Filter-protected transcervical CAS: 6 (27%)

AVR: 1 (4.5%)
CABG+AVR: 3 (13.5%)
CABG+MVR: 2 (9%)
CABG only: 15 (68%)

{ On-pump: 11 (73%)  
Off-pump: 4 (27%) }
Results:

Deaths: 0
Myocardial infarctions: 0
Ipsilateral strokes: 0
(Ipsilateral T.I.A.): 1
Contralateral strokes: 1 (4.5%) (major)

Total: 1 (4.5%)
# CAS & Cardiac Surgery

## CEA vs CAS

<table>
<thead>
<tr>
<th></th>
<th>OPERATIVE MORTALITY</th>
<th>IPSILATERAL STROKE</th>
<th>MIOCARDIAL INFARCTION</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYNCHRONOUS CEA+CABG</td>
<td>4.6%</td>
<td>3.0%</td>
<td>3.6%</td>
<td>11.2%</td>
</tr>
<tr>
<td>(litterature)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMBINED CAS &amp; Cardiac Surgery</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(our experience)</td>
<td></td>
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</tbody>
</table>
# CAS & Cardiac Surgery

Other CAS experiences

<table>
<thead>
<tr>
<th></th>
<th>Nº Patients</th>
<th>OPERATIVE MORTALITY</th>
<th>STROKES</th>
<th>MIOCARDIAL INFARCTION</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYNCHRONOUS* CAS+Cardiac Surgery (Mendiz et al, 2006)</td>
<td>30</td>
<td>10%</td>
<td>0</td>
<td>0</td>
<td>10%</td>
</tr>
<tr>
<td>SYNCHRONOUS* CAS+CABG (Versaci et al, 2007)</td>
<td>37</td>
<td>5.4%</td>
<td>2.7%</td>
<td>0</td>
<td>8.1%</td>
</tr>
<tr>
<td>COMBINED CAS+Cardiac Surgery (Our experience)</td>
<td>22</td>
<td>0</td>
<td>4.5%</td>
<td>(contralat.)</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

*CAS in the angiographic suite and then transfer to the operating room for surgery
Conclusions:

Combined CAS and cardiac surgery seems a safe procedure:
- low mortality and low incidence of MI
- no stent thrombosis with delayed double antiplatelet regimen
- no major postoperative bleedings
- acceptable incidence of strokes

…but still a small experience

…work in progress…
Thank you!
Carotid artery stenting

Less invasive

\[ \downarrow \text{Mortality, Myocardial Infarctions} \]

Needs double anti-platelet regimen

\[ \uparrow \text{Bleeding risk} \]
Other “synchronous” experiences (not combined)

  3 deaths (10%), no strokes, no MI $\Rightarrow$ total: 10%

  2 deaths (5.4%), 1 stroke (2.7%), no MI $\Rightarrow$ total: 8.1%