No disclosures
Stroke: Scope of the Problem

- 795,000 new / recurrent stroke/year
- #1 cause of disability
- 3rd leading cause of death
- $75.8 billion in 2013

American Heart Association
US Presidents
Mini-Incision Carotid Endarterectomy

2-3 cm incision

Mini skin incision for carotid endarterectomy (CEA): A new and safe alternative to the standard approach

Enrico Ascher, MD, Anil Hingorani, MD, Natalie Marks, MD BVT, Richard W. Schutzer, MD, Manikyam Munyala, MD, Suresh Nahata, MD, William Yorkovich, RPA, and Theresa Jacob, PhD, Brooklyn, NY

Purpose: Patients requiring surgery are naturally attracted to shorter incisions because they tend to cause less pain and are esthetically more appealing. To substantially shorten the length of standard skin incisions (4 to 7 inches) for carotid endarterectomy (CEA), we used preoperative duplex scanning to outline the carotid bifurcation as well as to determine

JVS - 2005
Overall Stroke / Mortality Rates:
1060 patients / 1200 cases

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>11</td>
<td>(0.9%)</td>
</tr>
<tr>
<td>Death</td>
<td>5</td>
<td>(0.4%)</td>
</tr>
<tr>
<td>Combined</td>
<td>15</td>
<td>(1.25%)</td>
</tr>
</tbody>
</table>
## Serum Creatinine & CEA Complications

166 pts

<table>
<thead>
<tr>
<th>Creatinine (mg/dL)</th>
<th>1.5 – 2</th>
<th>2.1 - 3</th>
<th>&gt; 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>103</td>
<td>41</td>
<td>22</td>
</tr>
<tr>
<td>Stroke</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mortality</td>
<td>1 *</td>
<td>0 **</td>
<td>4</td>
</tr>
<tr>
<td>Combined</td>
<td>2 (1.9%)</td>
<td>0</td>
<td>4 (18%)</td>
</tr>
</tbody>
</table>

* p < 0.01
** p < 0.02
Improved Results:
Decreasing Mortality
**Duplex-Guided Carotid Stenting**

**Limitations**

- *Aortic branches visualization*
- *Filter deployment*
- *Cerebral vasculature imaging*
Aortic Arch MRI
Bovine Aortic Arch
**Duplex - Assisted Carotid Stenting**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>74</td>
<td>(44 – 92)</td>
</tr>
<tr>
<td><strong>Primary</strong></td>
<td>26</td>
<td>(63%)</td>
</tr>
<tr>
<td><strong>Restenosis</strong></td>
<td>15</td>
<td>(37%)</td>
</tr>
</tbody>
</table>

41 Cases
Risk factors (41 cases)

- **HTN** 86%
- **CRI** 52%
- **CAD** 51%
- **DM** 40%
- **Smoking** 31%
ICA & CCA Duplex Mapping
Duplex – Guided Arterial Cannulation
Duplex-Assisted Carotid Stenting

Fluoroscopy

Cannulation

Ipsilateral CCA
Primary Duplex - Assisted Carotid Stenting
Protection Device Position
Primary Duplex - Assisted Carotid Stenting
Duplex - Assisted Carotid Stenting

- **Filterwire EZ** \(^\circledR\)  39 cases
- **Debris**  18 cases (46%)
**Duplex - Assisted Carotid Stenting**

**Procedure duration**

- **Mean** 48 min ± 20
- **Range** 26 min – 90 min
- **CCA cannulation**
  - **Left** (25) 33 min ± 25
  - **Right** (16) 14 min ± 8

*P < 0.04*
Cerebral Arteriography
Current Indications for Stenting

- Previous carotid endarterectomy
- Previous major neck surgery
- Radiation therapy to the neck
- Surgically inaccessible lesion
- Vocal cord palsy
- High risk patient for surgery
- Serum Creatinine $\geq 3$
Duplex–assisted internal carotid artery balloon angioplasty and stent placement: A novel approach to minimize or eliminate the use of contrast material

Enrico Ascher, MD, Natalie A. Marks, MD, RVT, Richard W. Schutzer, MD, and Anil P. Hingorani, MD, Brooklyn, NY

**Background:** Carotid artery balloon angioplasty and stenting (CBAS) is emerging as an acceptable alternative to carotid endarterectomy in selected high-risk patients. Conversely, patients with pre-existing renal impairment, diabetes, or both may be harmed by the nephrotoxic contrast agents required during CBAS. We attempted to limit or eliminate the use of contrast material during CBAS.

**Methods:** Eighteen patients with severe carotid stenoses (≥70%) underwent CBAS at our institution over the last 12 months with duplex scan–assisted CBAS. Of these, 12 were primary procedures, and 6 were performed for carotid re-stenosis. Fourteen patients (78%) were neurologically asymptomatic. The average age of these patients was 75 ± 11 years (range, 44-92 years). Hypertension, chronic renal insufficiency (serum creatinine level ≥1.5 mg/dL), coronary artery disease, diabetes, and smoking were present in 89%, 67%, 59%, 33%, and 28% of patients, respectively. Preoperative duplex carotid mapping was performed in all cases. All procedures were performed with patients under local anesthesia and light sedation.
Interventional Vascular Ultrasound

A New Vascular Surgery Sub-Specialty
Carotid Artery Disease:
Ultrasound Guided Stenting

Enrico Ascher, MD
Natalie Marks, MD

NYU-Langone Hospital, Brooklyn &
The Vascular Institute of New York®