

# CAS for post CEA Restenosis – Indications, Technique, and Outcomes

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I do not have any potential  
conflict of interest.

# Recurrence Rate after CEA

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CEA Recurrence Rate 5 - 10%\*

Most recurrent stenoses appear within the 1<sup>st</sup> two years after CEA.

Most recurrent stenoses are asymptomatic.

\* S Rugonfalvi-Kiss et al. Stroke, 2005; 36:944-8

# Recurrence Rate after CEA

1203 patients undergoing CEA

Restenosis was defined as recurrent luminal narrowing >50% at the endarterectomy site.

178 (14.7%) patients developed restenosis >50% at a mean follow-up of  $365 \pm 80$  days.

Of all patients with restenosis >50% at 1 year after CEA, 159 (89.3%) did not have signs of residual stenoses at 3 months.

G. W. van Lammeren et al.: Restenosis after carotid surgery. The importance of clinical presentation and preoperative timing. Stroke 2011;42:965-971

# Recurrence Rate after CEA

1324 CEAs in 1198 pts.

Restenosis that required RCEA 212

192 first RCEAs and 27 second RCEAs

Interval from primary CEA to first RCEA ranged from 2 months to 29 years, average of 4.4 years

Male - female ratio: 45% - 55%

Cranial nerve injuries in 25 of the 192 patients: 13%

Cranial nerve injury in primary CEAs: 4%

A. George Akingba et al.: Managing Recurrent Carotid Artery Disease with Redo Carotid Endarterectomy: A 10-year Retrospective Case Series. *Ann Vasc Surg* 2014;28:908-916

# Recurrent stenosis after CEA

What is the cause of recurrent stenoses?

Thrombus formation

Myointimal hyperplasia

Atherosclerosis

# Recurrent stenosis after CEA

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Few weeks after CEA: Thrombus!

First 4 years: Myointimal hyperplasia  
Vessel wall injury during CEA(?)

After 4 to 5 years:  
Progression of atherosclerosis

# What to do with recurrent stenoses?

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Observation and BMT

CEA once more

CAS



# Whom do we treat with CAS?

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Patients with re-stenosis >70-80%

... some examples

# Some Examples

S. W. m-72 yrs.

11 month after CEA:

- recurrent stenosis >90%
- Type 3 aortic arch
- CAS with telescoping technique



# Some Examples

S. W. m-72 yrs.

11 month after CEA:

- recurrent stenosis 90%
- CAS with telescoping technique
- Stent in ICA



# Some Examples

K. C. m-71 y

4 months after CEA  
recurrent 90% CCA  
stenosis

Stent placement  
only in CCA



# Some Examples

F.B. m-82 yrs

8 months after CEA

ICA, ECA and CCA stenoses

CAS from ICA to CCA

ECA not treated



# Pathogenesis of these Lesions?

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The angiograms and the location of the stenoses speak for a clamping damage during CEA (?).

# Own Results

Patients	87	100%
Men	66	76%
Women	21	24%
Time after CEA		2.6 yrs.
Technical success		100%
Complications		0%

Low risk CAS because the stenoses are not caused by atherosclerotic plaques.

# Conclusions

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- Restenosis after CEA is not rare, but mostly benign.
- Psychological burden for the patient when he/she learns that the artery is again narrowed.
- CAS good alternative to CEA, but not evidence based in these cases.
- CAS only in high degree stenoses  $>80\%$ , because ICA occlusion can occur.