Characterization of Plaque Prolapse Following Carotid Artery Stenting by OCT

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Disclosure Statement of Financial Interest

I, Bernhard Reimers DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.
Definition

Plaque prolapse is defined as tissue extrusion through the stent struts post-procedure.

Consequences of plaque prolapse

Possible distal embolization

Heart: From enzyme rise to heart attack

Brain: From ischemic lesions to stroke
Necrotic core and fibrotic components were associated with development of PP; and both components in prolapsed plaque were associated with cardiac enzyme elevation after DES implantation.
SPACE

CEA & CAS have additional complications within 30 days

Lancet 2006
DW MRI before and 5 days after CAS
Cause of plaque prolapse

Cheese grater effect of stents:
- during deployment,
- during postdilatation (most TCD hits),
- during 30-days post procedure
Cheese grating is not always good

Increased plaque prolapse from coronary experience:

- thrombotic lesion
- lipid core
- thin cap over necrotic core

Hung et al; Circ 2010

Differences between soft and hard cheeses–plaques
Detection of plaque prolapse

Angiography

IVUS

OCT

In coronary arteries
The concept of plaque scaffolding of stents

Closed-cell stents

- **NexStent**
  - Ø = 0.173 mm
  - Ø = 0.118 mm

- **Xact**
  - Ø = 0.173 mm

Open-cell stents

- **Precise**
  - Ø = 0.128 mm
  - Ø = 0.107 mm

- **Acculink**
  - Ø = 0.128 mm
Emboli Protection Strategies and OCT acquisition

Non Occlusive Technique
Emboli Protection Strategies and OCT acquisition
1 Positioning of OCT catheter distal to stent
2 Careful hand injection of 20cc dye (Ultravist 320)

3 When images ok: pull-back of OCT system
4 Hand re-aspiration of dye
Carotid OCT

After stent in stent with Acculink 6-8 x 40 mm and postdilatation with 5.5 x 20 a 12 atm balloon

Post stent OCT
Small ulcers (no clinical determinant of complications)
Open cell stent

Closed cell stent

Carotid OCT
Carotid OCT

Plaque rupture
Carotid OCT

Flow artefact
Carotid OCT

Plaque prolapse: Possible determinants of late complications
Carotid OCT before CAS
Lesion after stenting
Final result after post-dilatation
Conclusions

OCT after carotid stenting appears feasible and safe.

Using the occlusive technique, better quality images were obtained with the advantage not to increase the contrast load

Carotid OCT allows collection of important information regarding the stent and plaque behaviour not seen with standard angiography

Compared to IVUS less penetration (for plaque characterization), better surface images (for stent evaluation)
Coronary OCT

A. Malapposition
B. Prolapse
C. Prolapse
D. Prolapse
E. Prolapse
F. Dissection