

Washington TCT 2005

**Filters versus Occlusion Balloons
during CAS
Is there a clear preference?**

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Presenter Disclosure Information

Name: Klaus Mathias

Within the past 12 months, the presenter or their spouse/partner have had the financial interest/arrangement or affiliation with the organization listed below.

Nothing to disclose




Why do we use CP?

Stroke is an embolic disease (>95%)

**CAS is accompanied by embolization
in 100% of the cases**

**Brain is more than moving arms and
legs**

Critical Particle Size

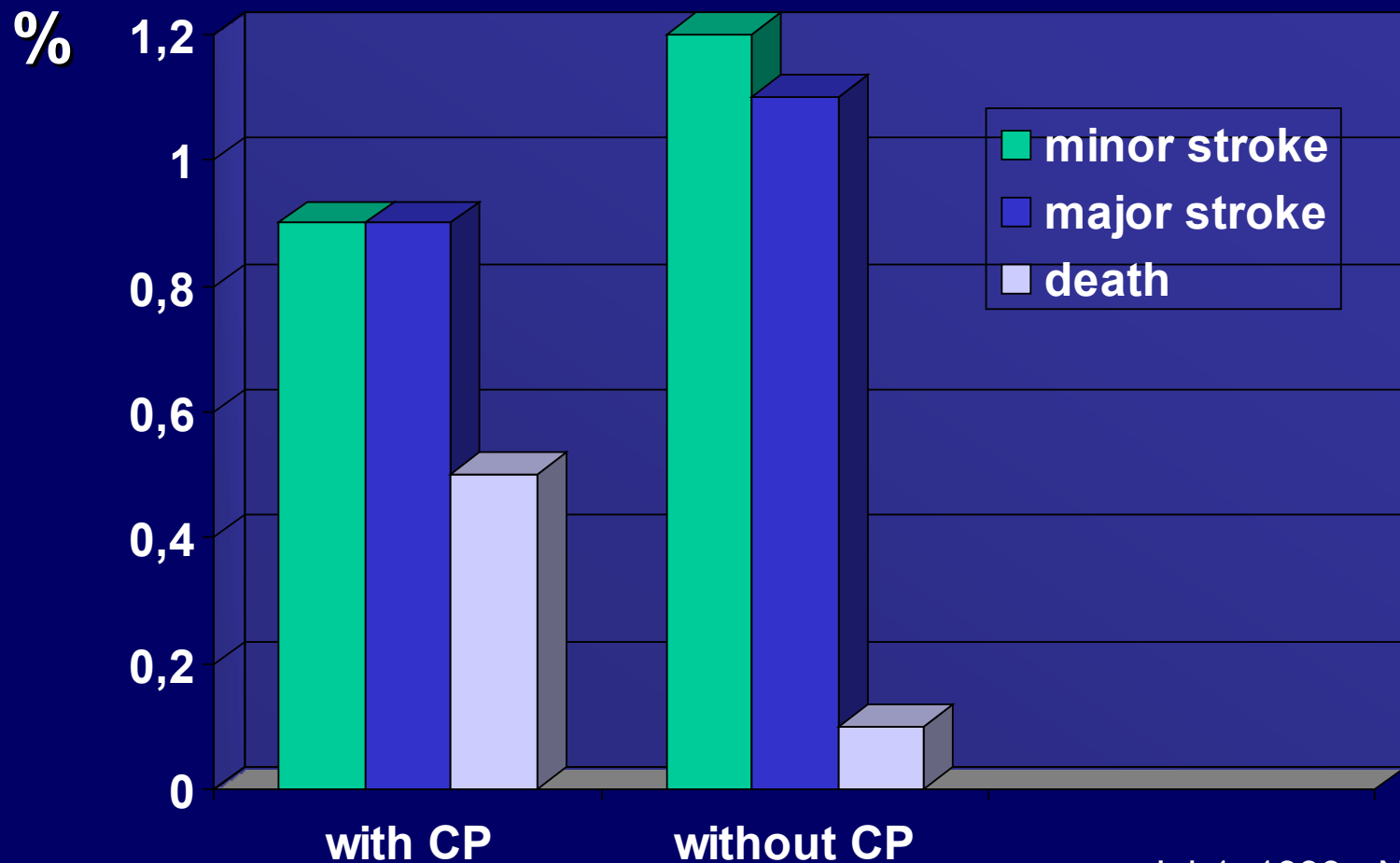
- particles $< 20\mu$  pass cerebral circulation
- particles $20 - 200\mu$  micro-infarction possible
- particles $> 200\mu$  will cause a stroke

Do we have sufficient evidence for the benefit of CP?

- **Single Center Data**
- **ProCAS**
- **Global Carotid Stent Survey**
- **Trials**

ProCAS Registry

Comparison CAS with/without CP



Jul-1, 1999 - Nov-30, 2004

5 CAS Trials in the US

CAS with cerebral protection

Only different filters were used

More than 800 patients included

Virmani:

filters contained in 62 - 87%

various plaque material

Principles of Cerebral Protection

Distal balloon protection

1984 J. Theron (Caen), S. Bockenheimer (Frankfurt)

Proximal balloon protection

1989 R. Kachel (Erfurt), J. Parodi (St. Louis)

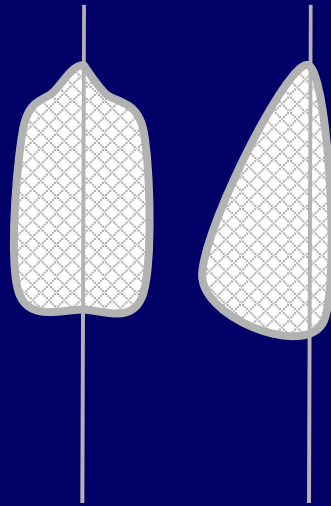
Filter protection

1981 K. Mathias (Dortmund), G. Roubin (NY), N. Hopkins (Buffalo) etc.

Filter Protection

Designs of Filters

symmetrical
asymmetrical



- safer filtering
- better apposition to vessel wall in curved segments

bare wire
mounted on wire

- crossing the lesion is easier
- wire of choice

Angioguard

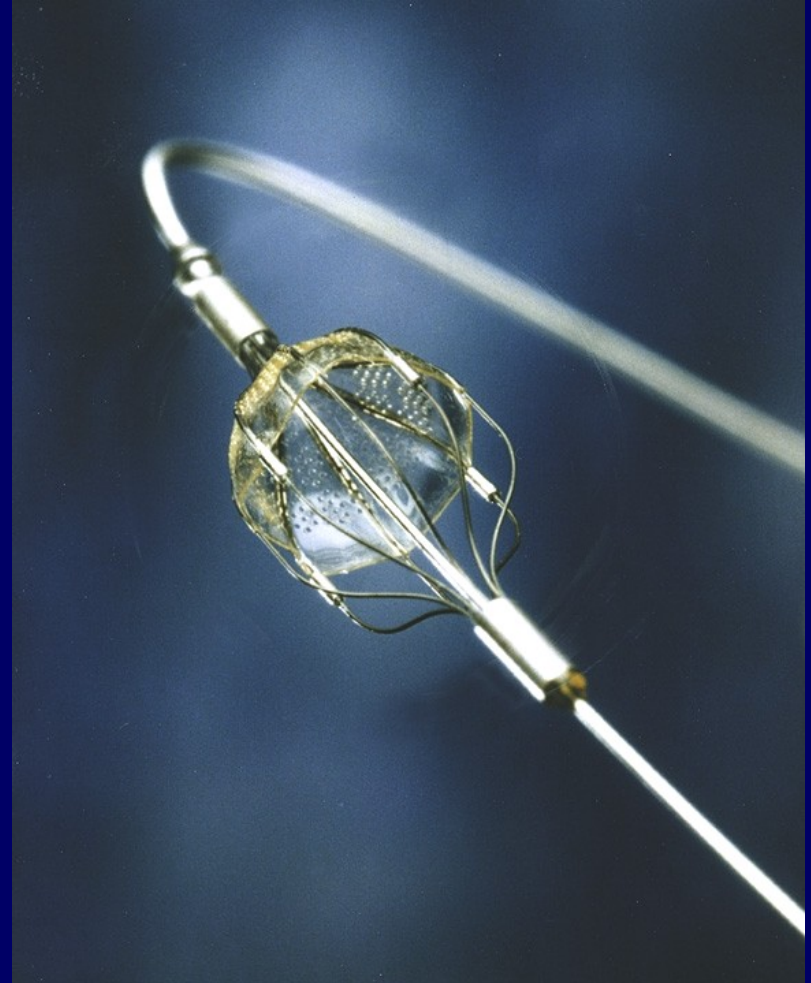


first filter

3rd generation

good trackbility

short filter basket



AccuNet



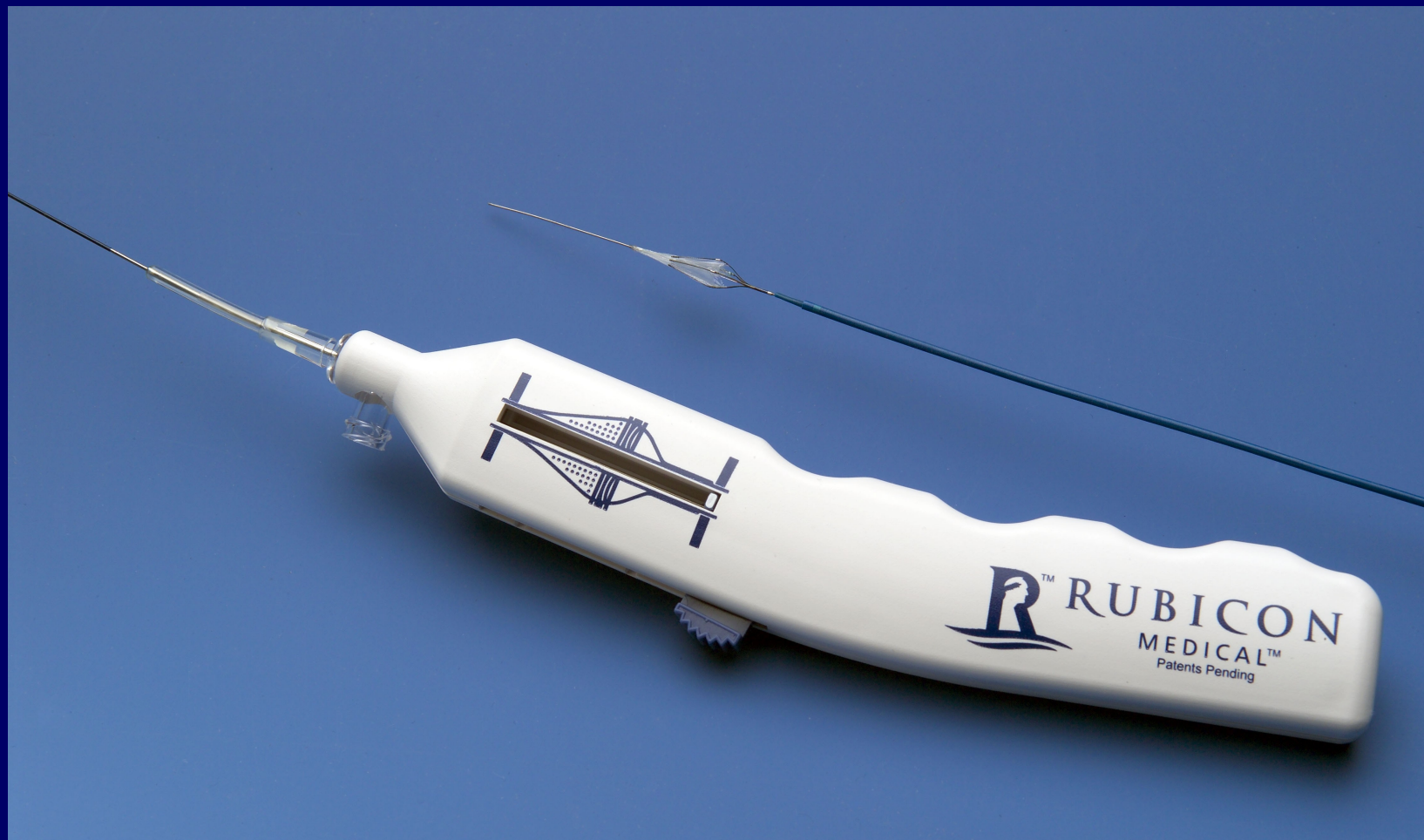
**good filter in curved artery segments
retrieval catheter will be improved**

Emboshield



bare wire 0.014" – 0.018"
high capture capacity

Rubicon



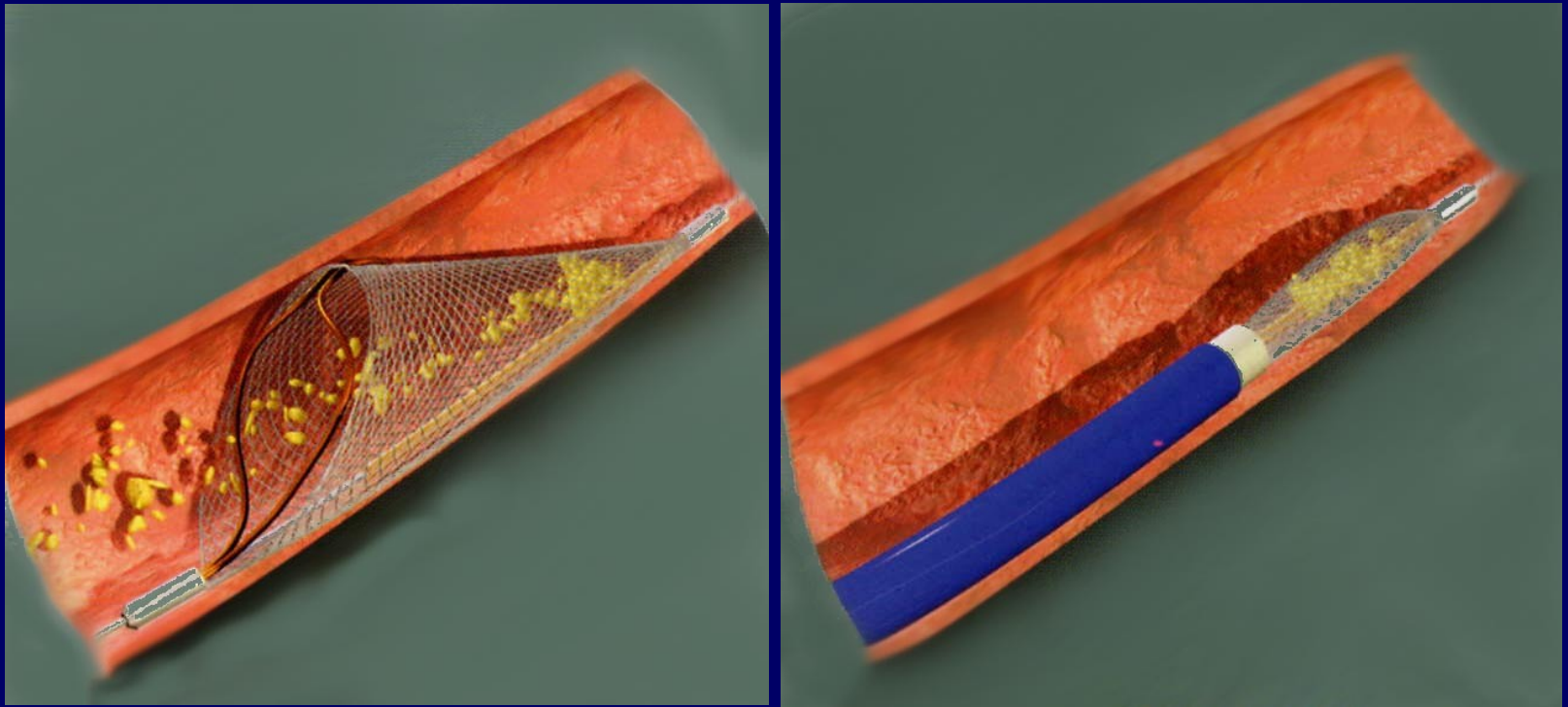
filter with lowest profile 2.2-F

FilterWire EZ



asymmetric filter: one size fits all up to 6 mm

Spider



**bare wire – heparin coated – asymmetrical
different size of meshes**

Balloon Protection

PercuSurge

The PercuSurge GuardWire™ System is not approved for use in the U.S. in the coronary, cerebral or carotid vasculature.



The PercuSurge GuardWire™ System



PercuSurge

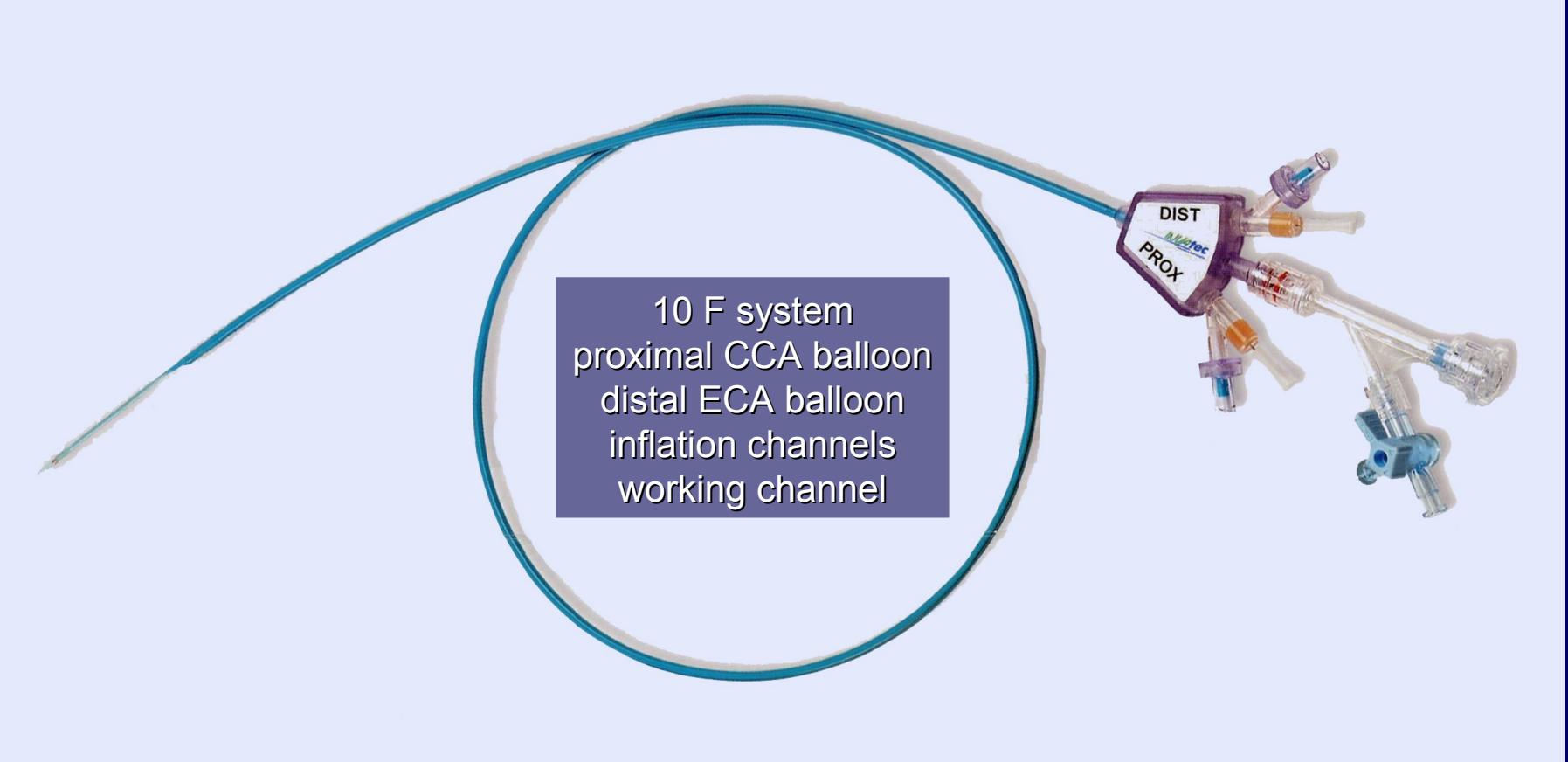


can be placed in tortuous ICAs
no retrieval problems
aspiration of 60 -80 cc

PercuSurge

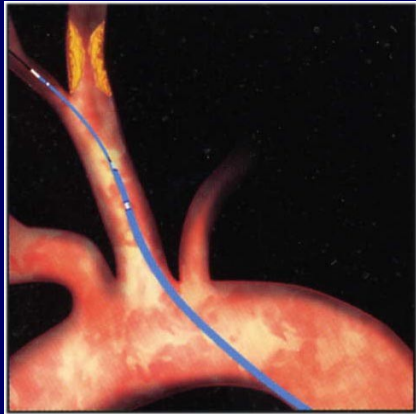


MO.MA Proximal Balloon Protection

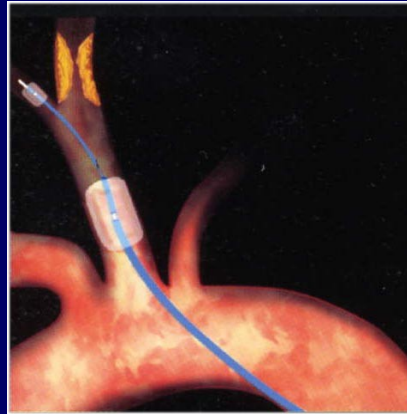


10 F system
proximal CCA balloon
distal ECA balloon
inflation channels
working channel

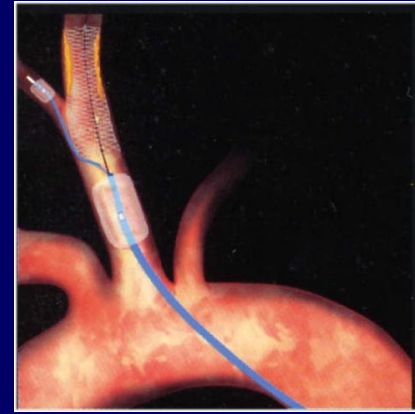
MO.MA Proximal Balloon Protection



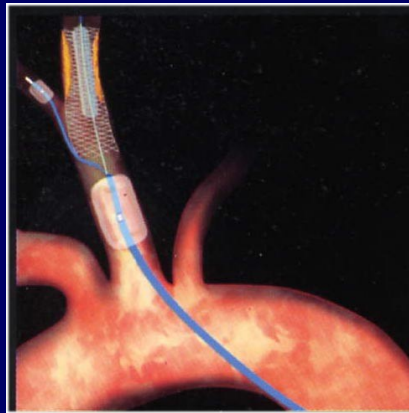
placing the balloon
in the ECA



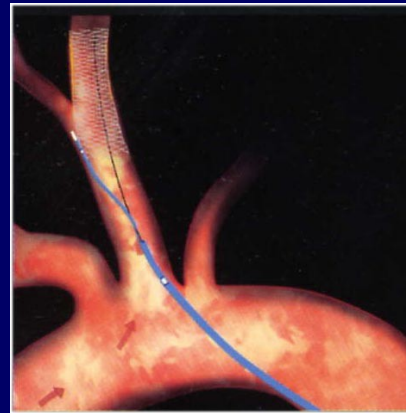
balloons inflated
in CCA & ECA



stent placement in
ICA



balloon dilatation of
ICA



recovery of EPD

MO.MA Trial

- Stent implantation successful 100 %
- MO.MA system successfully positioned 100 %
- Transient neurological symptoms 7.6 %
 - procedure continued successfully in all patients
 - intermittent balloon deflation 1.8%
- Diameter stenosis (NASCET) 85 ± 8 % \rightarrow 6 ± 8 %
- Duration of flow blockage 7.6 ± 5.9 min
- Amount of aspirated blood 62 ± 17 cc
- Debris collected **79,2%**

Make your selection

What do Filters Catch?

- filters have a pore size of $\sim 110\mu\text{m}$
- smaller particles will pass the filter
- filters may not be well apposed to the arterial wall
- filter retrieval may wash out particles

Filters

- **preserve blood flow during CAS**
- **contrast material injection always possible**
- **higher precision in stent placement**
- **correct size selection important**
- **ACT > 250 s**
- **crossing of lesion sometimes difficult**
- **placement of filter in tortuous ICA difficult**
- **spasm may occur**
- **recovery of filter difficult:** retrieval catheter will not easily cross stents with open cell design

Distal Balloon Protection

- **crossing of lesion easy**
- **tortuosity of ICA does not matter**
- **incomplete angiogram**
- **retrieval easy**
- **efficacy of aspiration questionable**
- **5-10% of patients do not tolerate the interruption of blood supply**

Proximal Balloon Protection

- **ICA lesion not touched**
- **ICA tortuosity does not matter**
- **thrombus can be dissolved and aspirated**
- **incomplete angiogram**
- **retrieval easy**
- **efficacy of aspiration high**
- **large device profile**
- **5-10% of patients do not tolerate the interruption of blood supply**

ProCAS Registry

Cerebral Protection

yes	3,370	72.8%
no	1,259	27.2%

registered since Oct-1, 2000

Type of CP

filter	2,825	83.8%
distal balloon	244	7.2%
proximal balloon	238	7.1%
unknown	63	1.9%

registered since Oct-1, 2000



Safety first!
For your patient
and yourself!