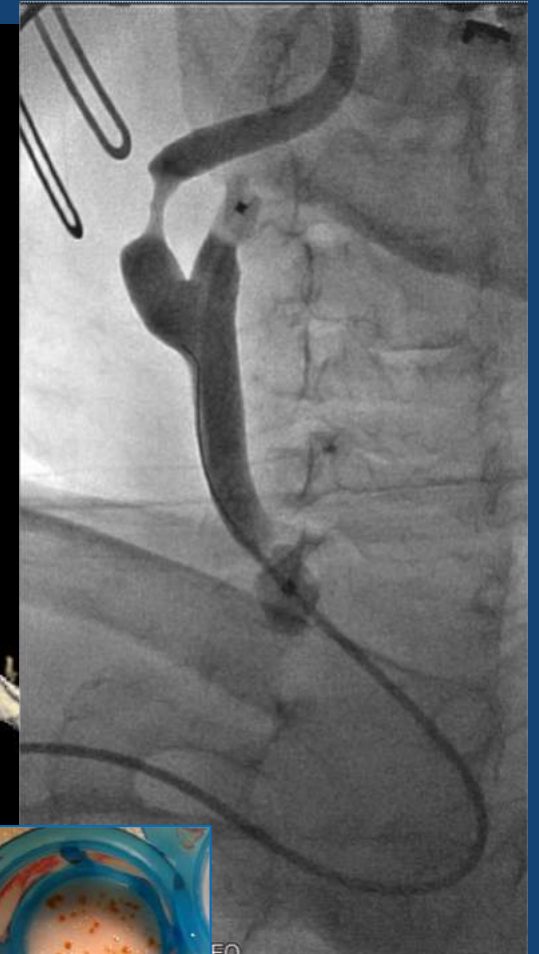


# Is proximal protection really superior to filter devices and ready to be used for all comers?

**Piero Montorsi, MD**

Professor of Cardiovascular Diseases  
Dep.'t Clinical Sciences and Community Health,  
University of Milan  
Director, 2<sup>nd</sup> Invasive cardiology Unit  
Centro Cardiologico Monzino, IRCC, Milan, Italy



# Disclosure



Speaker name:

.....**Piero Montorsi**.....

I have the following potential conflicts of interest to report:

- ☒ **Consulting for Medtronic and Terumo**
- ☐ Employment in industry
- ☐ Stockholder of a healthcare company
- ☐ Owner of a healthcare company
- ☐ Other(s)
  
- ☐ I do not have any potential conflict of interest

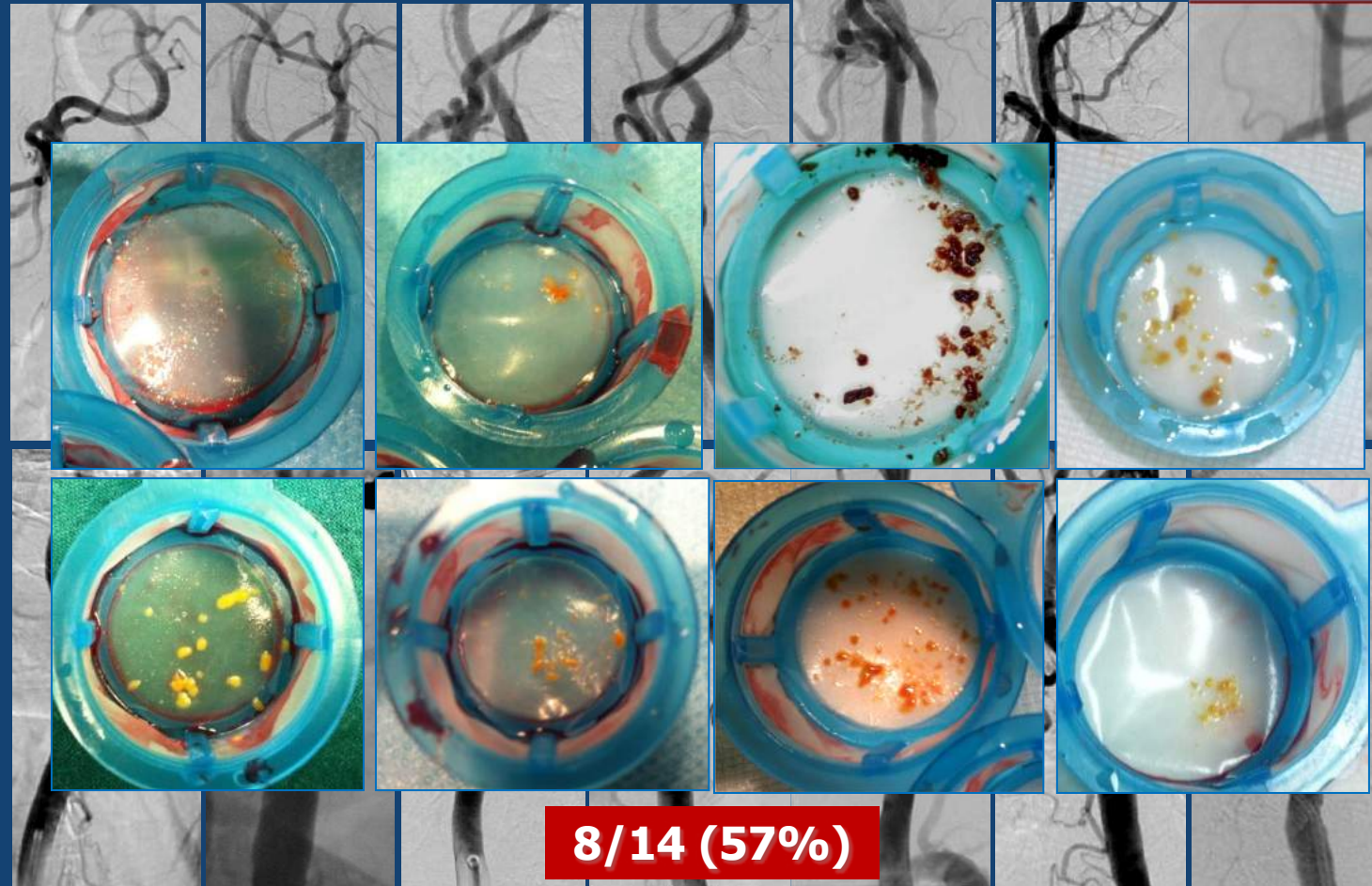
# Role of type of cerebral protection in CAS

*Would you choose filter or proximal protection in these anatomies?*



Asymptomatic  
carotid artery  
stenosis

+ soft plaques



8/14 (57%)



# Carotid stenting w proximal protection

*Established, probable, still uncertain issues*



## Proximal Endovascular Occlusion for Carotid Artery Stenting

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## Evaluation of proximal protection devices during carotid artery stenting as the first choice for embolic protection

Marius Hornung, MD; Stefan C. Bertog, MD; Jennifer Franke, MD; Dani Id, MD; Iris Grunwald, MD; Horst Sievert\*, MD

## Carotid Artery Stenting With Proximal Embolic Protection via a Transradial or Transbrachial Approach: Pushing the Boundaries of the Technique While Maintaining Safety and Efficacy

## Carotid Wallstent Versus Roadsaver Stent and Distal Versus Proximal Protection on Cerebral Microembolization During Carotid Artery Stenting

*yes/no*



**Safe & Effective**



**Superior to Filter devices**



**First choice for 'all comers'**



**Complementary role with other procedural variables**

# CAS with proximal protection

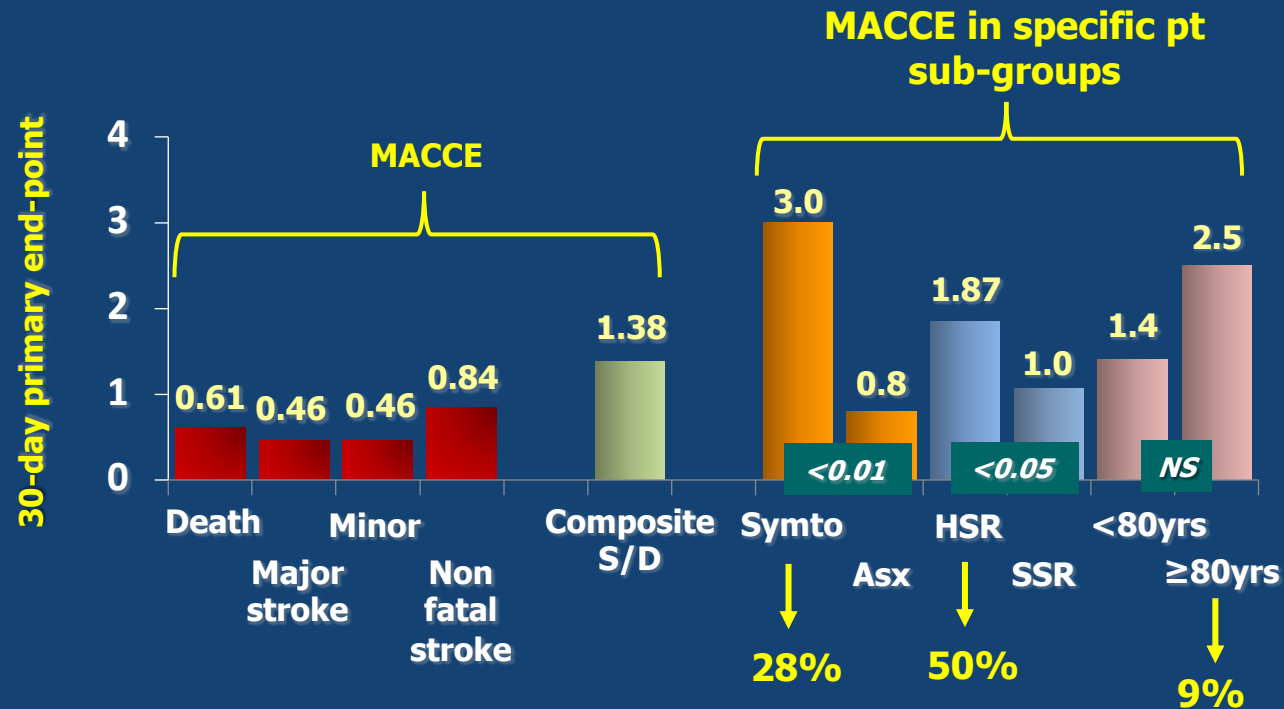
## *Results from the largest consecutive series*



1.300.unselected pts underwent CAS with PP (Mo.MA Ultra system) from July 2004 to May 2009.

Rate of PP: **60%** (89/149) in the first 7 months, then **94%** (1211/1288) till the end.

Exclusion criteria: ECA occlusion, severe ipsilateral CCA lesion. High level of operator expertise.



- Procedural success: 99.7%
- Vascular complication: 2.3%
- Predictors of MACCE at 30 days:
  - Symptomatic pts
  - Operator experience (\*)
 From 4% (Level 1) to 1.2% (level 3)
- Similar outcome in the first group (E/I criteria guided) vs. the second group of pts (all-comers)

Stabile E. *JACC* 2010; 55:1661

\*Cremonesi A. *Stroke* 2006;37:2400

# Proximal protection vs. Distal Filter in CAS

## *The first CRT. Role of surrogate end-points*



### Microembolization During Carotid Artery Stenting in Patients With High-Risk, Lipid-Rich Plaque

A Randomized Trial of Proximal Versus Distal Cerebral Protection

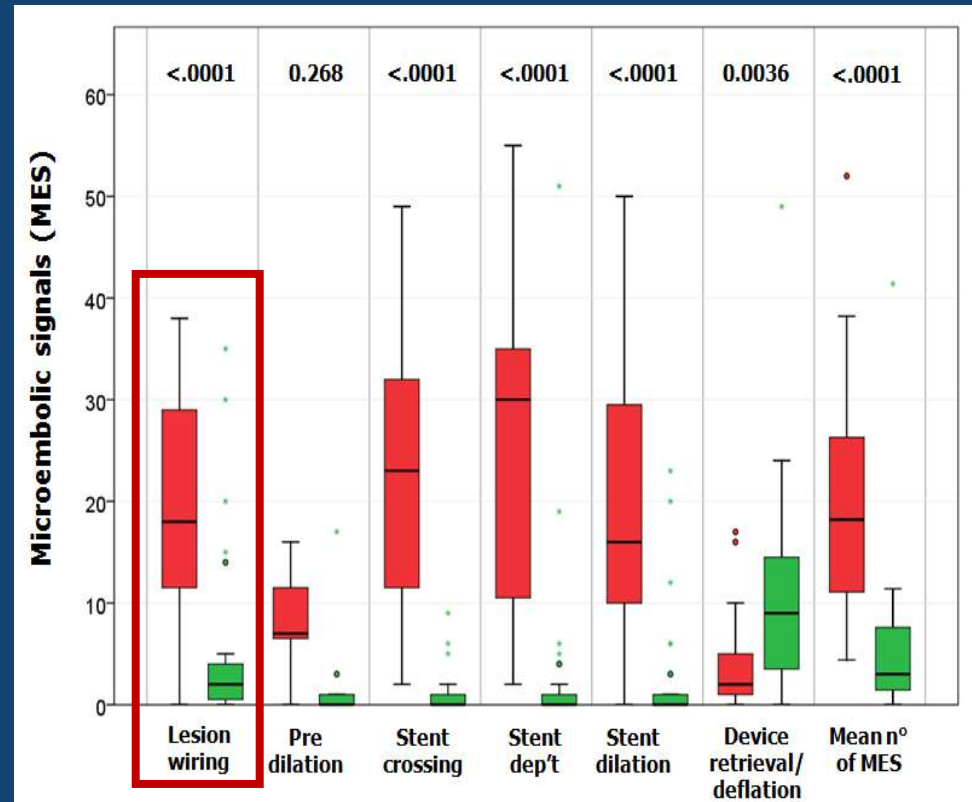
Variable	Estimated Effect (%)	95% CI	p Value
Age (1-yr Increment)	-0.4	-3.4 to 2.8	0.822
HSR versus LSR	-12.2	-52 to 60.9	0.677
Lesion length (>15 vs. ≤15)*	-16.6	-49.6 to 37.9	0.482
Lesion eccentricity (>1.2 vs. ≤1.2)*	52.7	-10.6 to 161	0.128
Stenosis diameter by ECST (1% increment)*	-0.5	-4.6 to 3.8	0.826
Pre-dilation (yes vs. no)	-18.4	-51.4 to 36.9	0.445
Protection device (MO,MA vs. FilterWire EZ)	-81.7	-88.6 to -70.7	<0.0001

Evaluated by using multivariate analysis of covariance. \*Lesion length, lesion eccentricity, and percentage diameter stenosis were assessed using computed tomography angiography.

HSR = high surgical risk; LSR = low surgical risk; other abbreviations as in Tables 2 and 3.

#### MES by TCD

■ Distal filter    ■ Mo.MA

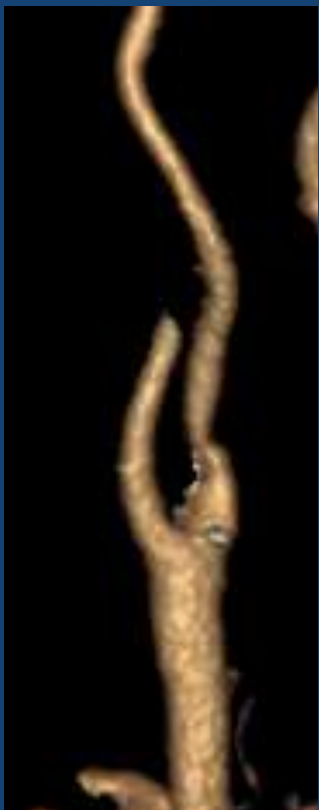


Montorsi P. JACC 2011;58:1656



# Proximal protection vs. Distal Filter in CAS

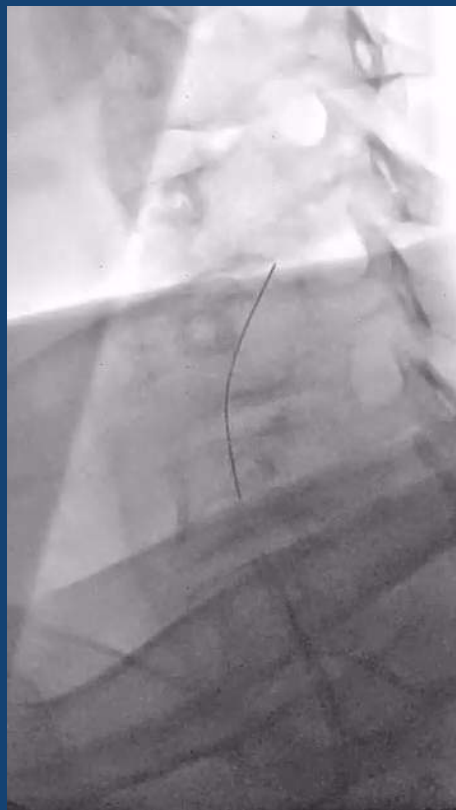
## *The unprotected lesion crossing step (with filter)*



LICA stenosis  
CTA, VR  
9/2021



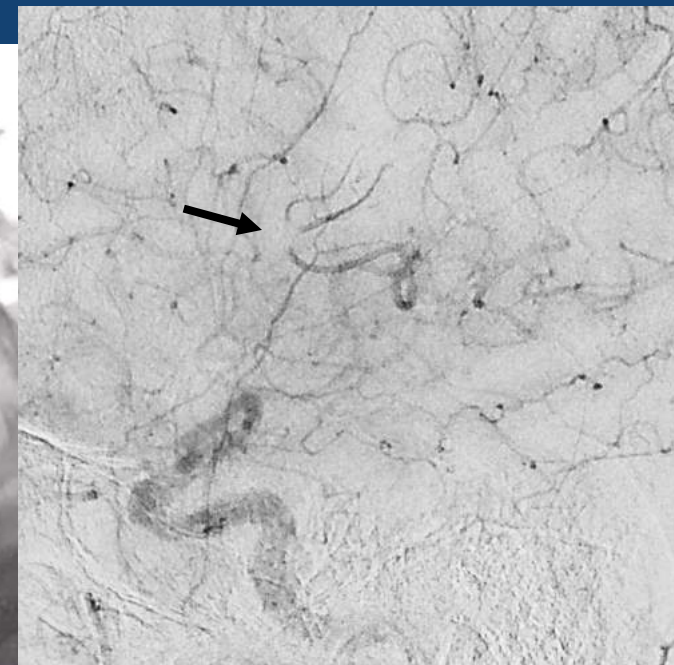
LICA stenosis  
Baseline DSA  
TR approach



Stenosis crossing with  
FilterWire (first attempt)



Stenosis crossing with  
FilterWire (second attempt)



**Onset of mild aphasia and  
right hand distal weakness  
LL intracranial DSA showed  
distal MCA sub-occlusion**

**Symptoms resolved within 3  
hours. DW-MRI negative at  
48 hours. Unventful f/u**

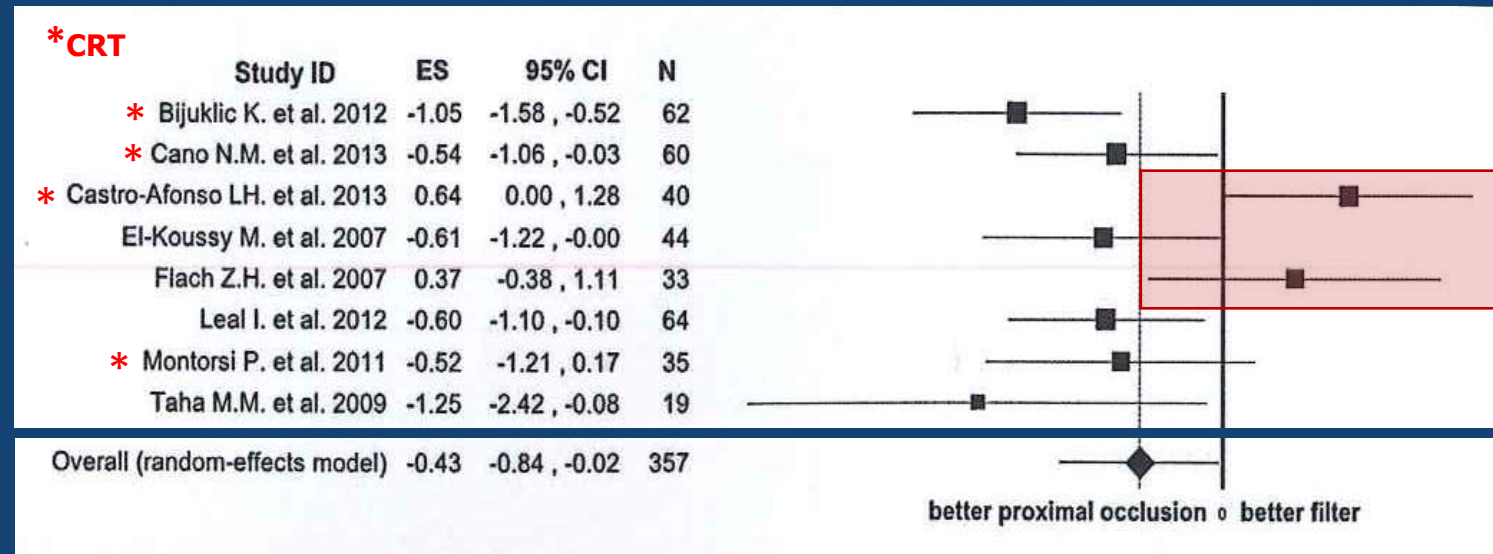
# CAS with Proximal vs. Filter protection

## *DW-MRI data: A meta-analysis of 8 studies*



357 pts from 8 studies (5 CRTs) comparing CAS with Filter vs. proximal protection.  
End-point: Incidence of new ischemic lesions/patients by DW-MRI at 48 hrs

Stabile E. JACC Interv 2014;7:1177



Role of operator expertise and familiarity with both devices (not always reported)

- **de Castro-Afonso LH**: study enrollment: 16 months → 1.1 pt/month with flow-reversal (n=21). Expertise: >450 CAS w filter vs. 12 CAS w flow-reversal in 10 years. Specialty INR.
- **Flach ZH**: study enrollement: 3 years → <1 pt/month with MOMA (n=10). Expertise: Not reported. Specialty IR.



# CAS with Proximal vs. Filter protection

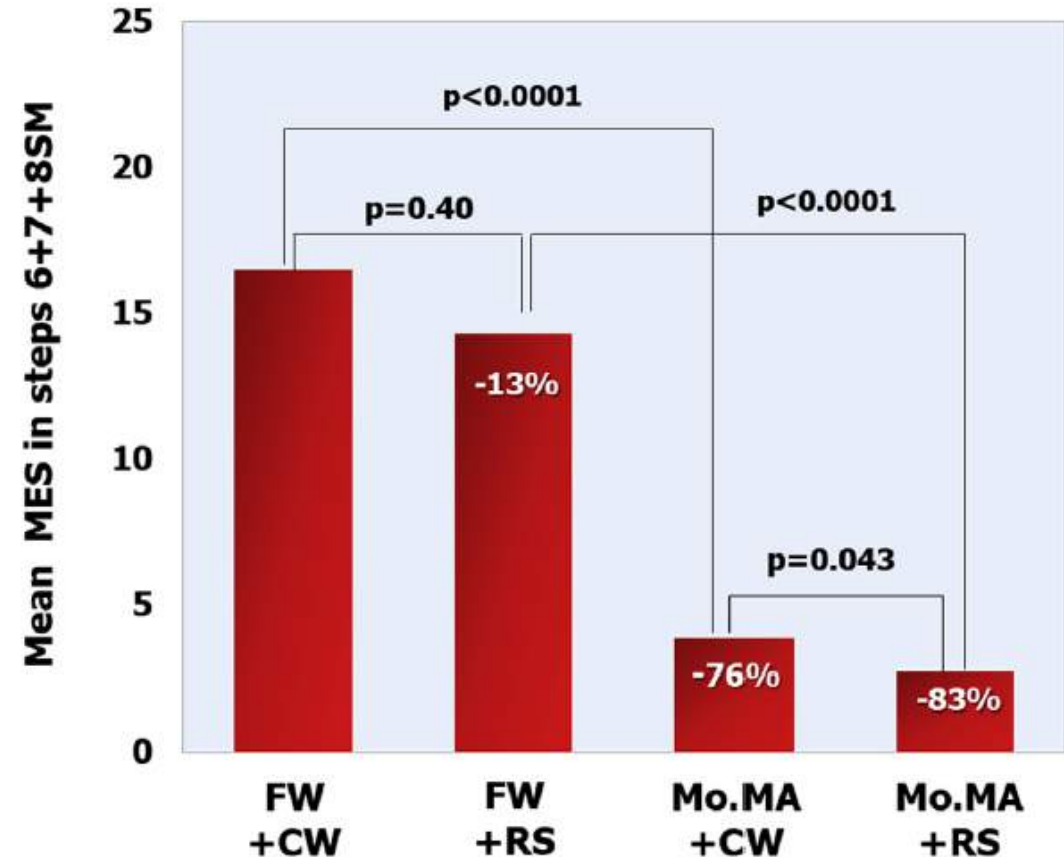
## *Any complementary role with the type of stent?*

### Carotid Wallstent Versus Roadsaver Stent and Distal Versus Proximal Protection on Cerebral Microembolization During Carotid Artery Stenting



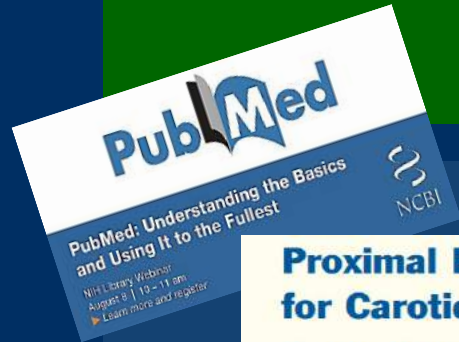
Piero Montorsi, MD,<sup>a,b,\*</sup> Luigi Caputi, MD,<sup>c,\*</sup> Stefano Galli, MD,<sup>b</sup> Paolo M. Ravagnani, MD,<sup>b</sup> Giovanni Teruzzi, MD,<sup>b</sup> Andrea Annoni, MD,<sup>b</sup> Giuseppe Calligaris, MD,<sup>b</sup> Franco Fabbicchi, MD,<sup>b</sup> Daniela Trabattoni, MD,<sup>b</sup> Stefano de Martini, MD,<sup>b</sup> Luca Grancini, MD,<sup>b</sup> Gianluca Pontone, MD,<sup>b</sup> Daniele Andreini, MD,<sup>a,b</sup> Sarah Troiano, MD,<sup>b</sup> Davide Restelli, MD,<sup>b</sup> Antonio L. Bartorelli, MD<sup>a,b</sup>

- 104/214 consecutive pts with high-risk, lipid-rich carotid stenosis
- Randomized to Carotid Wallstent/Roadsaver and FilterWire EZ/Proximal protection (Mo.MA Ultra)
- Transcranial Doppler assessment of procedural microembolic signals (MES)
- Primary endpoint:** Number of MES during CAS (by TCD)



# Carotid stenting w proximal protection

## *Safety, efficacy, first choice and superiority (to distal filter)*



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### Carotid Wallstent Versus Roadsaver Stent and Distal Versus Proximal Protection on Cerebral Microembolization During Carotid Artery Stenting

*yes/no*

*yes*

**Feasible, Safe and Effective**

*yes*

**Superior to Filter devices**  
*(in high risk plaques/pts, using surrogates)*

*yes*

**First choice for 'all comers'**  
*(in expert hands)*

*yes*

**Complementary role with DLS**