



***MEET 2008***  
***Carotid Course Session 1:***  
***Technical Aspects: Pro & Against Speaker***  
***Cannes, 28/06/08***

***“Why I don’t trust in filters”***

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***IRCCS Policlinico San Donato, Milano, Italy***

# “ Why I don't trust filters ”

The World Registry on 4221 CAS procedures reported in 2003 a 2.23% rate of strokes and procedure-related deaths when performed with cerebral protection versus 5.29% occurring in patients undergoing the procedure without cerebral protection.

Wholey MH & Al. Catheter Cardiovasc Interv. 2003; 60: 259-266

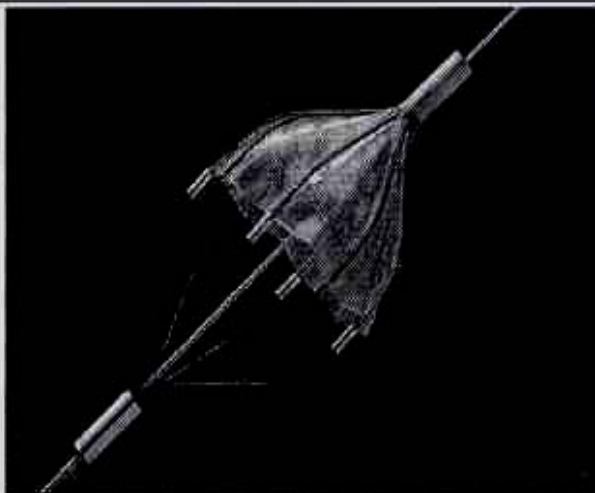
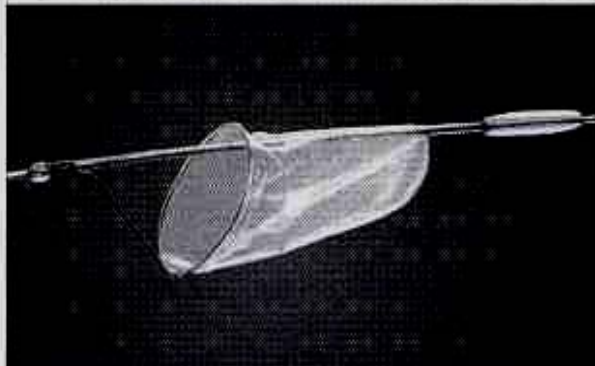
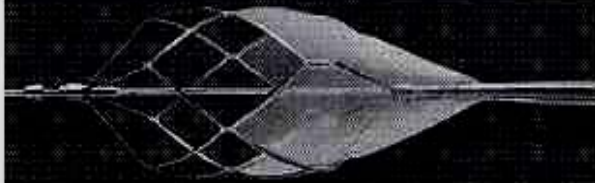
***So the question is not to trust in cerebral protection but in the strategy and hard-ware to accomplish this goal.***

# Cerebral protection during CAS can be achieved with:

- ❑ distal ICA balloon stop-flow systems
- ❑ proximal CCA + ECA stop flow with reversal of cerebral flow (PAES-Gore) or with direct aspiration (Moma-Invatec)
- ❑ filters in distal ICA

**Although there are no  
published data in  
randomized comparison  
studies that one system is  
better than the other;**

**which are the draw-backs of  
filters?**

	Device	Material	Pore Size, $\mu\text{m}$
Angioguard XP	 <p>The image shows the Angioguard XP distal protection filter. It features a conical, bell-shaped mesh structure supported by a central wire, attached to a catheter handle.</p>	Nitinol frame and polyurethane membrane	100
FilterWire EZ	 <p>The image shows the FilterWire EZ distal protection filter. It consists of a cylindrical mesh structure supported by a central wire, attached to a catheter handle.</p>	Nitinol frame and polyurethane membrane	110
RX Accunet	 <p>The image shows the RX Accunet distal protection filter. It has a diamond-shaped mesh structure supported by a central wire, attached to a catheter handle.</p>	Nitinol frame and polyurethane membrane	115

# Which are the problems that drive me not to trust in filters?

## CROSSING PROFILE

negotiating tortuous ICA and severe stenosis requires “unprotected” lesions crossing and can potentially produce distal embolization.

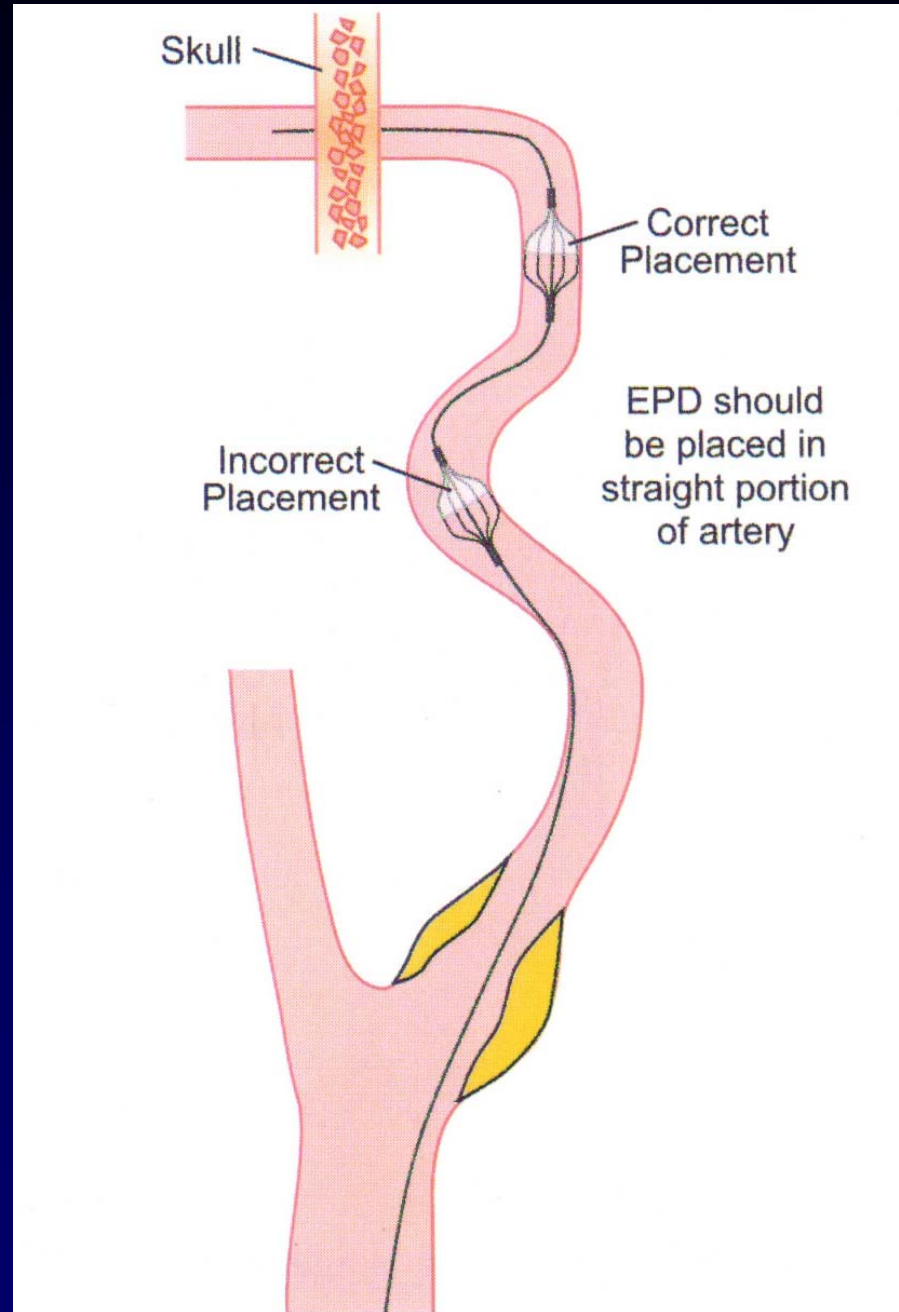
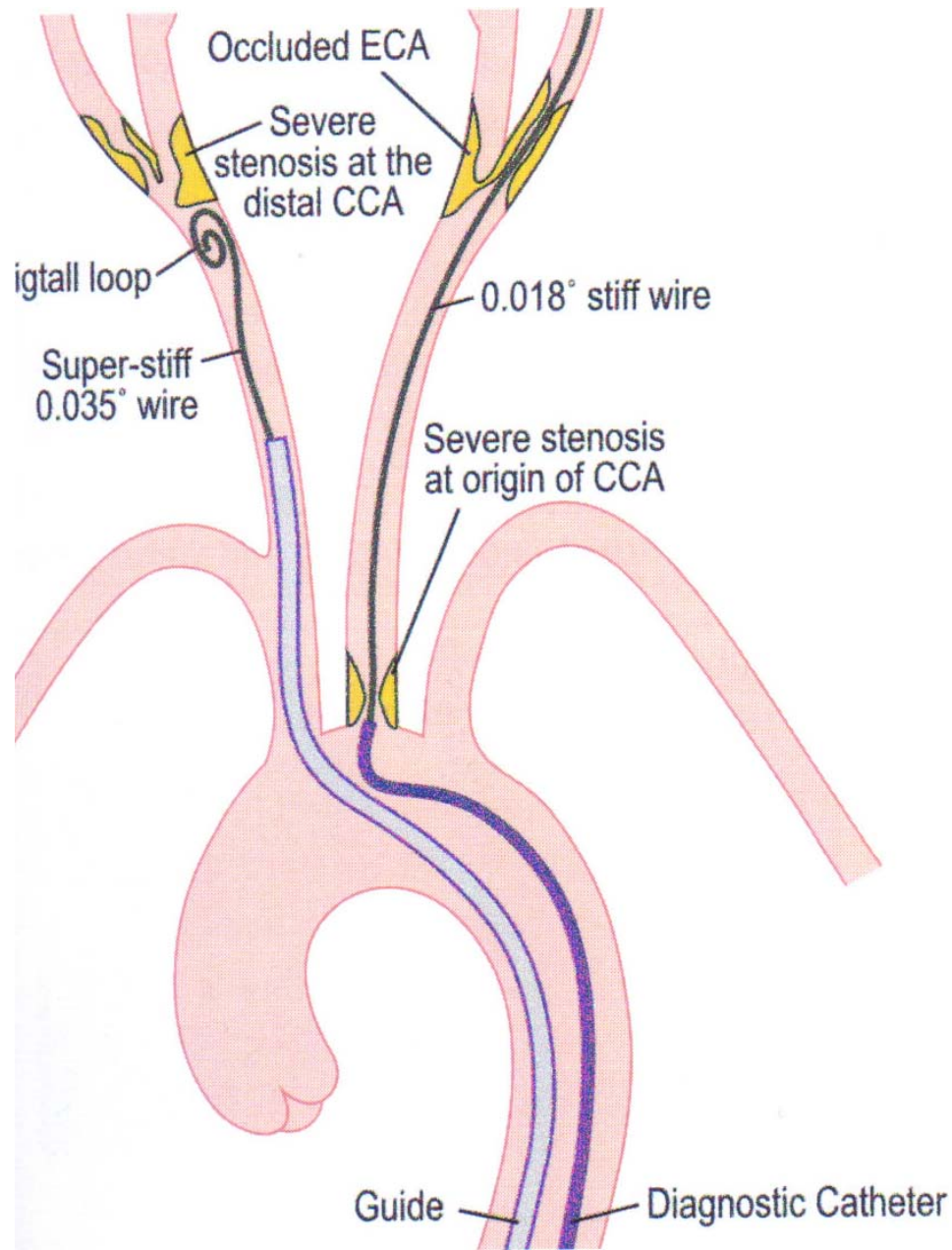
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# Filter apposition to distal ICA

All filters record a percent of missed emboli for the difficulty to a complete appose to the vessel – wall, mainly in presence of mild vessel tortuosity or irregular inner surface. *Vasospasm and dissection* can also be a consequence of interaction of filter structure to vessel wall.





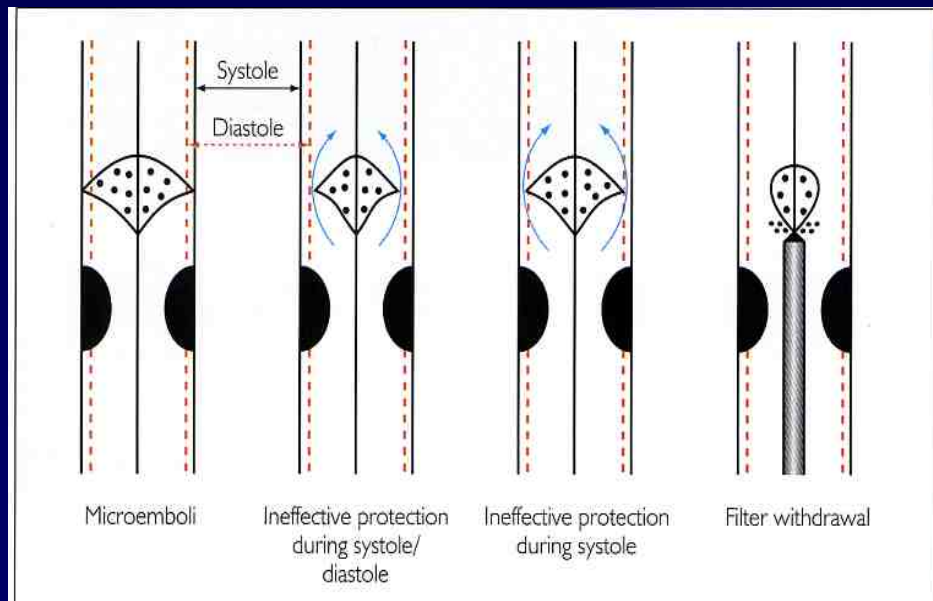
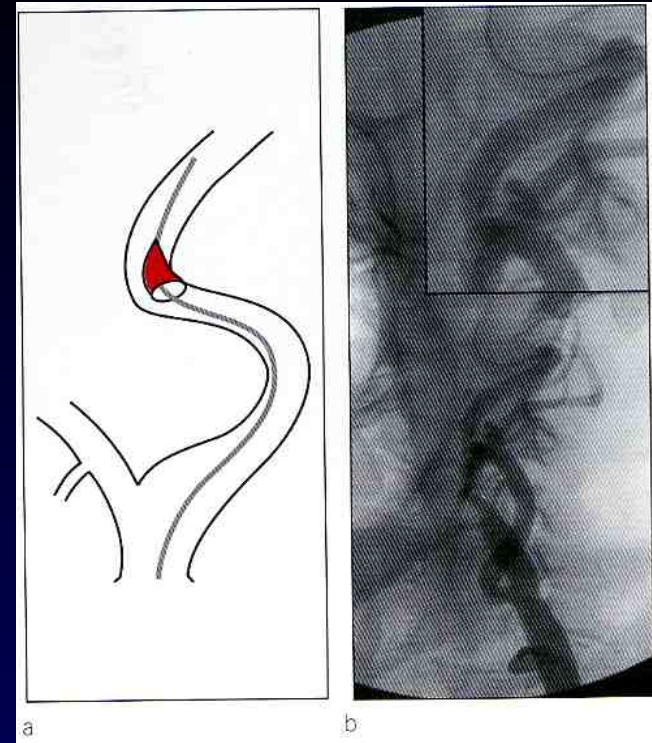


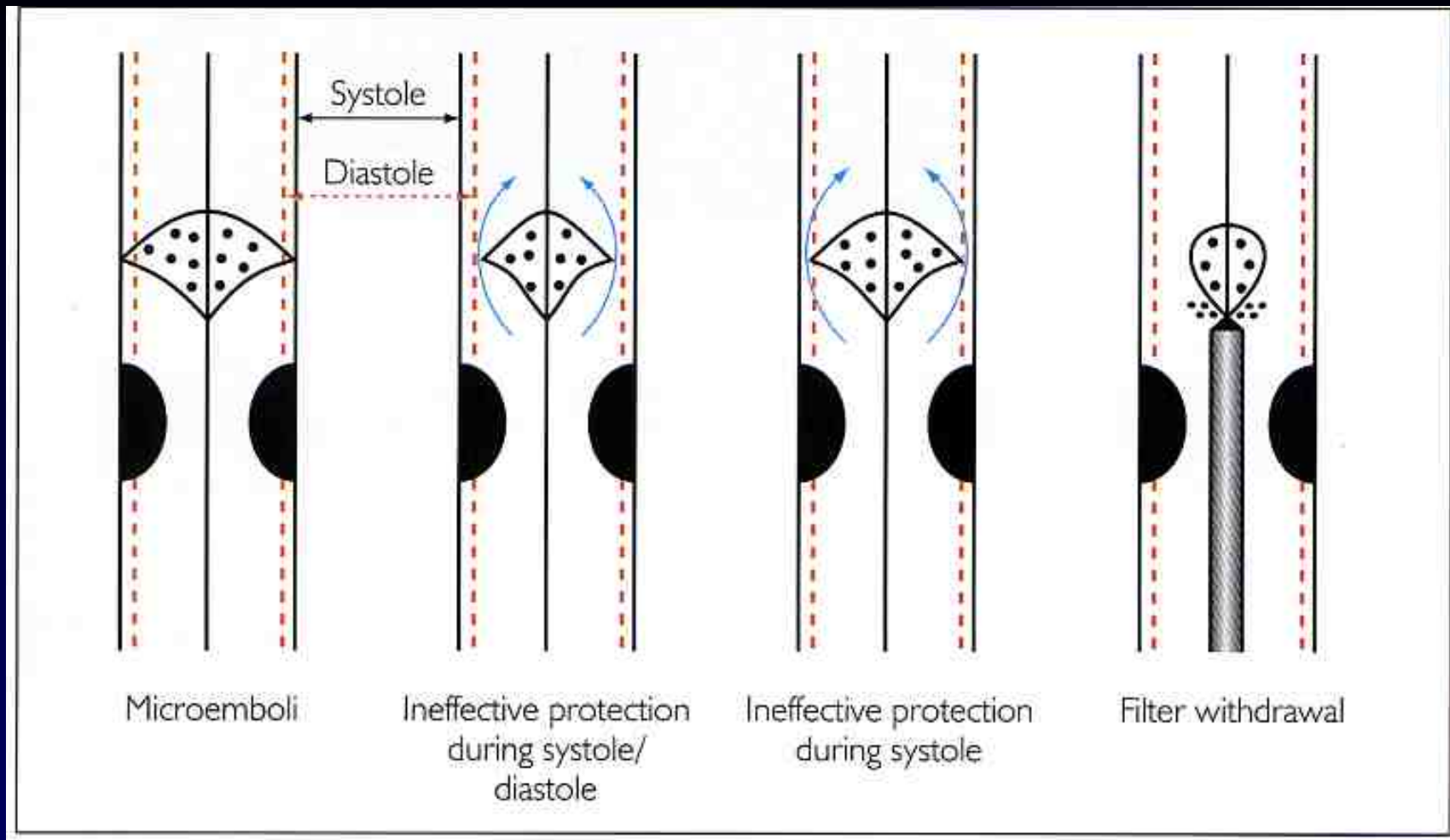
# Capture efficiency

is related to filter apposition and also to diameter of the filter microporus (100 - 115 microns).

It has been demonstrated that also particles of 50  $\mu\text{m}$  can provoke neurological alterations.

**Retrival of filter** can squeeze debries.

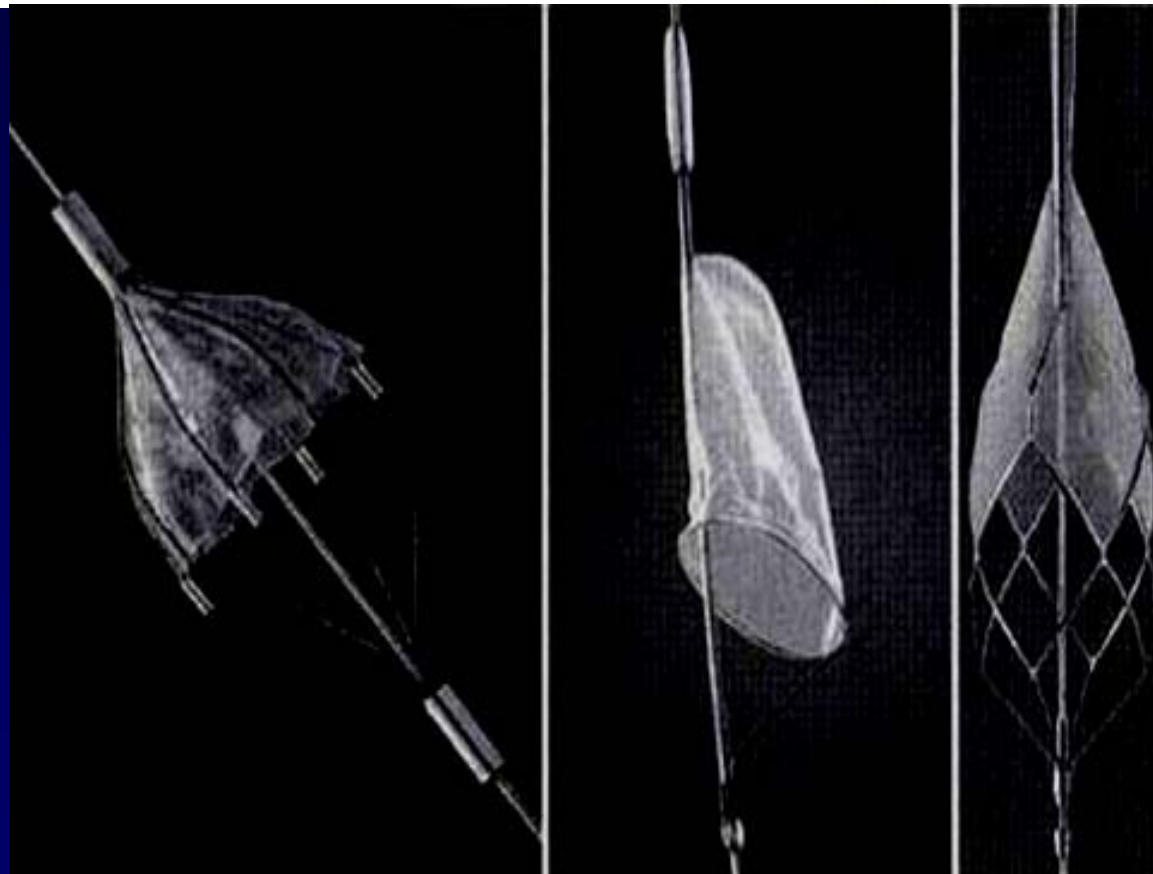




**M Henry & Coll, 2004 – Carotid angioplasty and stenting under cerebral Protection - 2004. Ed. Martin Dunitz Part VIII – Technique devices cap. 40 : 323-343**

**TABLE 2**  
**Mean Mass of Microspheres Missed by the Distal Protection Filters\***

		Vessel Inner Diameter, mm		
		5.0	5.5	6.0
Angioguard	$M_{in}$ , mg	$8.76 \pm 1.41$	$9.93 \pm 3.27$	$11.52 \pm 4.36$
	$M_{Ar}$ , mg	$0.66 \pm 0.92$	$1.08 \pm 1.48$	$1.64 \pm 1.22$
	$R_A$	7.5%	10.9%	14.2%
FilterWire	$M_{in}$ , mg	$8.08 \pm 1.71$	$8.38 \pm 1.93$	—
	$M_{Ar}$ , mg	$0.08 \pm 0.17$	$0.05 \pm 0.12$	—
	$R_A$	1.0%	0.6%	—
Accunet	$M_{in}$ , mg	$7.22 \pm 0.89$	$9.58 \pm 2.34$	$10.15 \pm 3.78$
	$M_{Ar}$ , mg	$0.30 \pm 0.06$	$0.02 \pm 0.08$	$0.14 \pm 0.25$
	$R_A$	4.2%	0.2%	1.4%

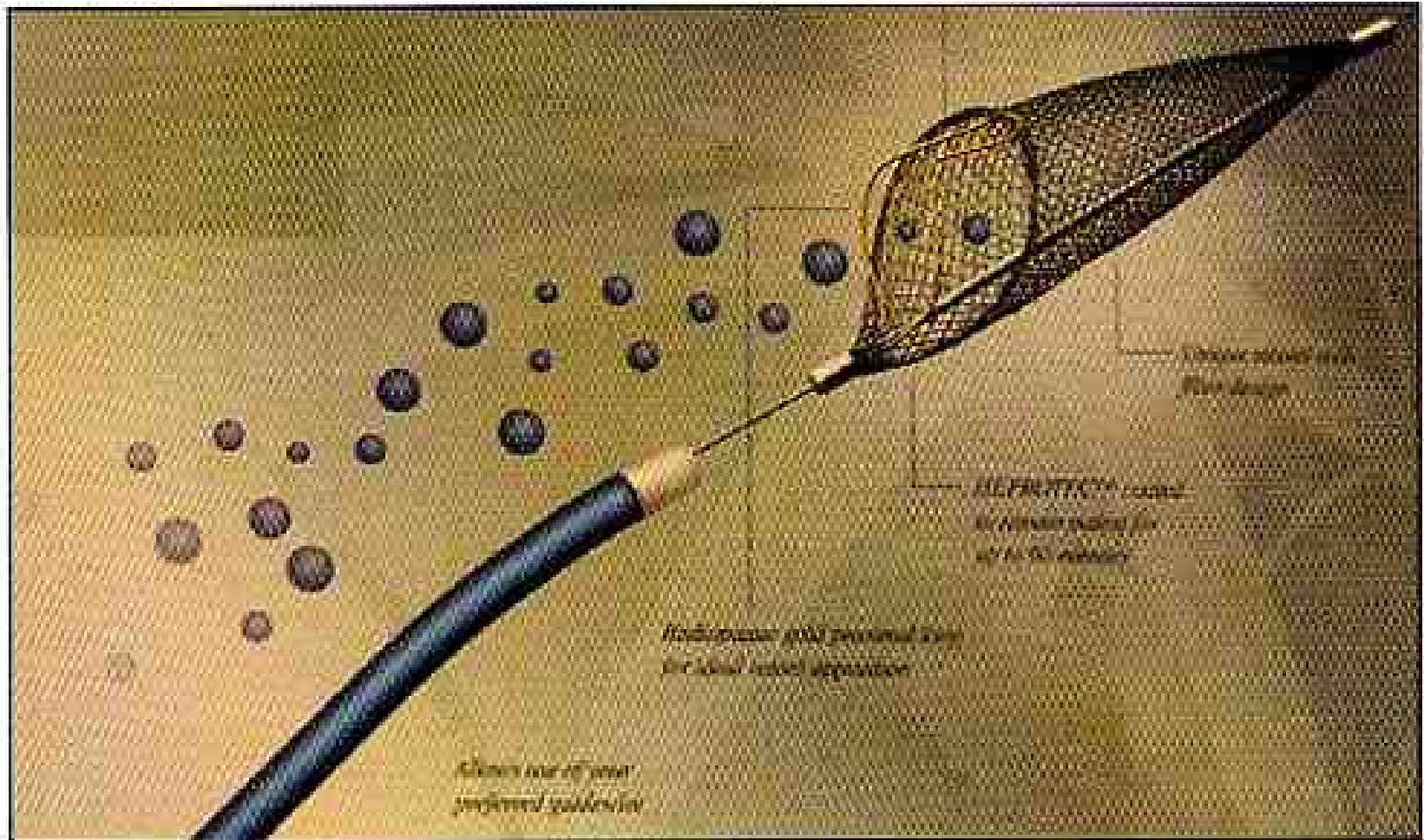


**Table 44.6** Complications related to the use of cerebral protection devices.

<i>Major complications</i>	<i>Group A</i>
Spiral dissection	1 (0.56)
Trapped guidewire	1 (0.56)
Overall	2 (1.12)

Data are shown as *n* (%).

**F. Castriota & Coll, 2004 Carotid angioplasty and stenting under cerebral Protection - 2004 Ed. Martin Dunitz Part VIII – Technique devices cap. 44 : 381-390**



# Parodi Antiembolism System (PAES)

