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## Effect of Two Different Neuroprotection Systems on Microembolization During Carotid Artery Stenting

After reading the study titled "Effect to Two Different Neuroprotection Systems on Microembolization During Carotid Artery Stenting" by Schmidt et al. (1) in the *Journal* and after having an extensive experience with a system that holds several similarities with the MO.MA device (Invatec s.r.l., Roncadelle, Italy), I can make the following comments.

The investigators stated that 71% of their patients had microembolic signals (MESs) after balloon dilation of the stent; MESs during stent placement and balloon dilation were more than six times higher than during wire passage. This latter observation suggests that antegrade flow was still present using the MO.MA device.

The utilization of balloon occlusion of the common carotid artery (CCA) and external carotid artery (ECA) and the description of continuous MESs during carotid artery stenting (CAS) using a filter device was reported earlier by us (2). The researchers did not reference this original study.

Using occlusion of the CCA and ECA, we experienced, as did Schmidt et al. (1), that MESs were still present; we attributed them to antegrade flow through branches not occluded by the balloon. The other potential explanation is a Venturi effect of the circle of Willis suctioning from the column of stagnant flow in the internal carotid artery after balloon occlusion.

Finally, owing to the above-mentioned findings, we added flow reversed to the occlusion of the CCA and ECA.

**Juan C. Parodi, MD***

*Surgery Department
Washington University
171 North Central
St. Louis, MO 63501
E-mail: parodij@msnotes.wustl.edu

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## REPLY

Dr. Parodi mentions his experience with a similar protection device, the PAES (Parodi antiembolism system) (1). Because of the requirement of brevity of our study (2), the comparative technical discussion of both systems (MO.MA vs. PAES) was not possible. An advantage of the PAES over the MO.MA system could be the potential continuous retrograde flow through the target lesion during the intervention. Establishment of a continuous retrograde flow in the internal carotid artery using this concept has been demonstrated in an animal model (3). However, there are no scientific data demonstrating and quantifying that, during the critical phases of stent placement, delivery and postdilation of the PAES permits an effective retrograde flow in humans. Dr. Parodi mentioned in his study (1) the use of this protection device in nine patients. Transcranial Doppler monitoring revealed no microembolic signals (MESs) during clamping of the common carotid artery in these patients. In our study, using the MO.MA system there was also a considerable number of subjects (48% of 21 patients) showing no MESs during stent deployment and during balloon dilation (29% of 21 patients). It is regrettable that a controlled multicenter registry, showing the safety and feasibility of the PAES, as it has been conducted recently using the MO.MA system (4), is not yet available. A randomized comparison between the PAES and MO.MA device using transcranial Doppler with detection of MESs would be of interest.

***Andrej Schmidt, MD**
**Dierk Scheinert, MD**
**Giancarlo Biamino, MD**

*Klinische und Interventionelle Angiologie
Universität Leipzig—Herzzentrum
Strümpellstrasse 39
04289 Leipzig
Germany
E-mail: Andrej.Schmidt@gmx.de

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