

protected territories. The device covers the innominate artery and left common carotid artery and thereby the right internal carotid artery, right vertebral artery, and left internal carotid artery territories, respectively. However, it does not cover the left subclavian artery, thereby leaving the left vertebral artery territory unprotected. Because most patients are either left vertebral dominant or codominant, this leaves not only the left vertebral artery territory at risk but the basilar artery and bilateral posterior cerebral artery territories at risk in most patients.

Using an analogy, to keep our homes protected from intruders, we not only lock the front and side doors but the back door as well. By leaving the back door (left subclavian and left vertebral arteries) open, we are allowing intruders (emboli) unfettered access to our home (brain).

Although it is possible that we may protect the whole brain and get similar results in terms of cognitive changes, we cannot blame everything on the “floor” until we lock all the doors.

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Please note: Dr. Abrams is a consultant and holds stock options in Keystone Heart.

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REPLY: Don't Leave the Back Door Open



Thank you for the opportunity to respond to Dr. Abrams's letter. Although we disagree on some points, we greatly appreciate his interest in our work and believe the discrepancies may be related to simple misunderstandings.

First, Dr. Abrams notes that we did not find a relationship between worsening cognitive deficits and new diffusion-weighted imaging lesions in the

SENTINEL study (1). We need to point out, however, that we in fact found such a relationship in that study (reported in the paper and as Online Figure 1B [1]). In the paper, we did observe that prior transcatheter aortic valve replacement studies did not observe such a relationship, which may be the source of the confusion.

Although somewhat outside the scope of the paper, we agree with Dr. Abrams's main point that the question of protected territories is important in a broader context. Let us examine his claims. He performs a calculation and concludes that 65% of lesions were outside protected territories. Unfortunately, this seemingly straightforward calculation is invalid for 2 reasons. First, and most important, the estimate must be performed on the control group, not the treatment group. To see why, one can imagine an ideal device that could prevent every single lesion in its protected zone; then, by definition, 100% of lesions would be in the “non-protected” region, no matter how small that region was. Updated with this important correction, the result of the calculation is 42%. Second, subtracting and dividing medians as proposed is not permitted statistically. The more appropriate approach is to calculate the ratio across subjects and then take its median. When both of these corrections are taken into account, the result is considerably lower: 35%.

Finally, we appreciate Dr. Abrams's door analogy. However, the problem with this assertion is that it implies that emboli will actively seek out the back door after being shut out of the front, rather than just continuing down the street.

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REFERENCE

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