

Letter to the Editor

Stroke welcomes Letters to the Editor and will publish them, if suitable, as space permits. Letters must reference a Stroke published-ahead-of-print article or an article printed within the past 4 weeks. The maximum length is 750 words including no more than 5 references and 3 authors. Please submit letters typed double-spaced. Letters may be shortened or edited.

Response by Singfer and Defreyne to Letter Regarding Article, “Unruptured Brain Arteriovenous Malformations: Primary ONYX Embolization in ARUBA (A Randomized Trial of Unruptured Brain Arteriovenous Malformations)-Eligible Patients”

In Response:

In their letter, which we have read with great interest, Liu and Chen raised several questions about our published results.¹ We wish to answer their questions and address the important topics they have mentioned.

First, for patients in our cohort who underwent endovascular embolization followed by stereotactic radiosurgery, the mean time interval between last endovascular embolization session and stereotactic radiosurgery was 91 days (SD, 63.1 days). In our cohort, the length of this time interval did not seem to influence the likelihood of having stroke or developing disability: the interval was not significantly different between patients who did or did not have stroke (the mean time interval in each group was 113 and 85 days, respectively, $P=0.343$, Mann–Whitney test), nor was it significantly different between patients with poor versus good modified Rankin Scale score at last follow-up (the mean time interval in each group was 72 and 98 days, respectively, $P=0.29$, Mann–Whitney test).

Second, in our brief report we did not supply a detailed subdivision of the localization of the unruptured brain arteriovenous malformation. In our cohort of 61 patients the unruptured brain arteriovenous malformation was lobar in 52 cases (85%), cerebellar in 8 cases (13%), and deep in 1 (2%). None of our patients had brain stem unruptured brain arteriovenous malformation.

Third, we did not report the symptomatic status of our patients after treatment. We agree with Liu and Chen that symptoms caused by arteriovenous malformations should not be neglected. However, the main indication for embolization of unruptured

brain arteriovenous malformation was prevention of hemorrhagic stroke and accompanied morbidity and mortality. Of course, some patients were hoping for relief of complaints (ie, headache or migraine) but the persistence or relief of symptoms does not determine the success of interventional treatment. The modified Rankin Scale is a validated tool, which is simple to use and clinically meaningful for the evaluation of treatment efficacy and safety as it reflects the degree of disability in patients regardless of their symptoms.^{2,3} For this reason the modified Rankin Scale score at last follow-up was chosen as an end point in our study.

Disclosures

None.

Uri Singfer, BSc

Faculty of Medicine and Health Sciences
Ghent University Hospital
Belgium

Luc Defreyne, MD, PhD

Department of Interventional Neuroradiology
Ghent University Hospital
Belgium



American Stroke Association

References

1. Singfer U, Hemelsoet D, Vanlangenhove P, Martens F, Verbeke L, Van Roost D, et al. Unruptured brain arteriovenous malformations: primary ONYX embolization in ARUBA (A Randomized Trial of Unruptured Brain Arteriovenous Malformations)-eligible patients. *Stroke*. 2017;48:3393–3396. doi: 10.1161/STROKEAHA.117.018605.
2. van Swieten JC, Koudstaal PJ, Visser MC, Schouten HJ, van Gijn J. Interobserver agreement for the assessment of handicap in stroke patients. *Stroke*. 1988;19:604–607.
3. Cognard C. A randomized trial of unruptured brain arteriovenous malformations study: what impact on clinical care and therapeutic decision? *AJNR Am J Neuroradiol*. 2015;36:619–622. doi: 10.3174/ajnr.A4294.

Response by Singfer and Defreyne to Letter Regarding Article, "Unruptured Brain Arteriovenous Malformations: Primary ONYX Embolization in ARUBA (A Randomized Trial of Unruptured Brain Arteriovenous Malformations)-Eligible Patients"

Uri Singfer and Luc Defreyne

Stroke. published online February 13, 2018;

Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Copyright © 2018 American Heart Association, Inc. All rights reserved.

Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://stroke.ahajournals.org/content/early/2018/02/12/STROKEAHA.118.020396.citation>

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in *Stroke* can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the [Permissions and Rights Question and Answer](#) document.

Reprints: Information about reprints can be found online at:
<http://www.lww.com/reprints>

Subscriptions: Information about subscribing to *Stroke* is online at:
<http://stroke.ahajournals.org/subscriptions/>