

Unruptured cerebral arteriovenous malformation treatment

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see [Unruptured cerebral arteriovenous malformation rupture risk](#).

The results of “A Randomized Trial of Unruptured Brain Arteriovenous Malformations” (ARUBA) suggested that observation alone resulted in less morbidity and mortality than intervention for these lesions. These findings generated significant controversy throughout the cerebrovascular community and resulted in several subsequent studies investigating the role of microsurgical resection on ARUBA-eligible patients ¹⁾.

The real-world evolution of management and outcomes of patients with unruptured brain arteriovenous malformations (AVMs) has not been well-delineated following the ARUBA trial findings of no general advantage of initial interventional (surgical/endovascular/radiotherapy) vs. initial conservative medical therapy. Nationwide practice in the management of unruptured AVMs changed substantially with the publication of the ARUBA trial in a durable and increasing manner. Fewer admissions with the interventional treatment of unruptured AVMs occurred, and a corresponding increase in admission for ruptured AVMs transpired, as expected with a strategy of watchful waiting and treatment only after an index bleeding event. Further studies are needed to determine whether these trends can be considered to be ARUBA trial effect or are merely coincidental ²⁾

Karlsson et al. in 2018 stated The ARUBA trial conclusion that medical management is superior to

medical management with interventional therapy for all unruptured AVMs could be repudiated ³⁾.

A relatively benign natural course of unruptured [cerebral arteriovenous malformations](#) (AVMs) has been recognized, and the decision to treat incidentally found AVMs has been questioned.

The [ARUBA trial](#) showed that medical management alone is superior to medical management with [endovascular treatment](#) for the prevention of [death](#) or [stroke](#) in patients with [unruptured brain arteriovenous malformations](#) followed up for 33 months. The trial is continuing its observational phase to establish whether the disparities will persist over an additional 5 years of follow-up ⁴⁾.

Meling et al published that microsurgical resection of unruptured [Spetzler Ponce classification A](#) arteriovenous malformations is worthwhile and still the “gold standard” therapy ⁵⁾.

1)

Luther E, Govindarajan V, McCarthy DJ, Burks J, Lu V, Ramsay I, Silva M, Starke RM. Brain Arteriovenous Malformations: Status of Open Surgery after A Randomized Trial of Unruptured Brain Arteriovenous Malformations. *Neurosurg Clin N Am*. 2022 Oct;33(4):443-448. doi: 10.1016/j.nec.2022.05.006. Epub 2022 Sep 11. PMID: 36229131.

2)

Patel SD, Saber H, Desai N, Otite FO, Kaneko N, Mehta TV, Hinman J, Hassan AE, Jadhav A, Liebeskind DS, Saver JL. Impact of ARUBA trial on trends and outcomes in symptomatic non-ruptured brain AVMs: A national sample analysis. *J Stroke Cerebrovasc Dis*. 2022 Dec;31(12):106807. doi: 10.1016/j.jstrokecerebrovasdis.2022.106807. Epub 2022 Oct 19. PMID: 36272182.

3)

Karlsson B, Jokura H, Yang HC, Yamamoto M, Martinez R, Kawagishi J, Guo WY, Beute G, Pan DHC, Aiyama H, Chung WY, Söderman M, Yeo TT. The NASSAU (New ASSEssment of cerebral Arteriovenous Malformations yet Unruptured) Analysis: Are the Results From The ARUBA Trial Also Applicable to Unruptured Arteriovenous Malformations Deemed Suitable for Gamma Knife Surgery? *Neurosurgery*. 2018 Oct 8. doi: 10.1093/neuros/nyy391. [Epub ahead of print] PubMed PMID: 30295870.

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Mohr JP, Parides MK, Stapf C, Moquete E, Moy CS, Overbey JR, Al-Shahi Salman R, Vicaut E, Young WL, Houdart E, Cordonnier C, Stefani MA, Hartmann A, von Kummer R, Biondi A, Berkefeld J, Klijn CJ, Harkness K, Libman R, Barreau X, Moskowitz AJ; international ARUBA investigators. Medical management with or without interventional therapy for unruptured brain arteriovenous malformations (ARUBA): a multicentre, non-blinded, randomised trial. *Lancet*. 2014 Feb 15;383(9917):614-21. doi: 10.1016/S0140-6736(13)62302-8. Epub 2013 Nov 20. PubMed PMID: 24268105; PubMed Central PMCID: PMC4119885.

5)

Meling TR. Microsurgical resection of unruptured Spetzler-Ponce grade A arteriovenous malformations is worthwhile and still the “gold standard” therapy. *Acta Neurochir (Wien)*. 2015 Sep;157(8):1289-90. doi: 10.1007/s00701-015-2476-7. Epub 2015 Jun 21. PubMed PMID: 26093621.

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