

# For lower-grade brain blood vessel malformations, surgery has 'excellent clinical outcomes'

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Interventional treatments—especially surgery—provide good functional outcomes and a high cure rate for patients with lower-grade arteriovenous malformations (AVMs) of the brain, reports the May issue of *Neurosurgery*, official journal of the Congress of Neurological Surgeons. The journal is published by Wolters Kluwer.

The findings contrast with a recent trial reporting better outcomes without surgery or other interventions for AVMs. "On the basis of these data, in appropriately selected [patients](#), we recommend [treatment](#) for low-grade [brain](#) AVMs," concludes the study by Dr. Laligam N. Sekhar and colleagues of University of Washington, Seattle.

## Good Results with Surgery for Lower-Grade Brain AVMs

The researchers evaluated their hospital's experience in treating 105 patients with AVMs from 2005 to 2012. Arteriovenous malformations are congenital defects consisting of an abnormal tangle of blood vessels. When AVMs are located in the brain, there is a risk that they may rupture and bleed, causing potentially life-threatening hemorrhagic stroke.

When AVMs are detected before rupture, options include medical (conservative) treatment, consisting of monitoring and follow-up; or

various active treatments, including surgery, an interventional procedure called embolization, or a radiation procedure called radiosurgery.

Dr. Sekhar and colleagues were particularly interested in comparing their experience with the results of the 2014 ARUBA clinical trial. In that study, patients randomly assigned to medical treatment had a lower three-year risk of stroke or death, compared to those undergoing other surgery or other interventions.

The new analysis focused on 61 adult patients with brain AVMs who would have been eligible for the ARUBA study. Dr. Sekhar and colleagues categorized the results by AVM severity: low-grade, intermediate, or high-grade. About half of the ARUBA-eligible patients had low-grade (grade I or II) AVMs. Most were treated with a combination of embolization and surgery or with radiosurgery.

At an average follow-up of two years, all outcomes were better for patients with lower-grade AVMs. Based on the same scale used in ARUBA, the rate of functional impairment was three percent in patients with grade I/II AVMs, compared with 20 to 25 percent for those with intermediate or high-grade AVMs.

Overall, 22 patients with low-grade AVMs were treated with surgery, usually after embolization. At their last follow-up, all 22 patients had normal functional status and "radiographic cure," with no remaining signs of AVM on brain imaging scans. The cure rate was higher with surgery than with radiosurgery.

The new findings "challenge the assertion that medical management is superior" to [surgery](#) or interventional treatments for unruptured brain AVMs, Dr. Sekhar and colleagues write. They highlight several important limitations of the ARUBA trial—especially the fact that patients were assigned to treatment groups regardless of the grade of

their AVM.

"This study shows that grade I/II ARUBA-eligible patients can have excellent clinical outcomes after treatment and confirms the challenges of treating higher-grade, unruptured brain AVMs," the researchers write. They add that the results "highlight the need for prospective, multicenter data to identify patients who may benefit most from treatment compared with medical management."

**More information:** "Treatment Outcomes of Unruptured Arteriovenous Malformations With a Subgroup Analysis of ARUBA (A Randomized Trial of Unruptured Brain Arteriovenous Malformations)-Eligible Patients" [DOI: 10.1227/NEU.0000000000000663](https://doi.org/10.1227/NEU.0000000000000663)

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