Bevacizumab for brain arteriovenous malformation treatment

- The use of Bevacizumab in the treatment of brain arteriovenous malformations: a systematic review
- Intra-arterial Bevacizumab in Adult Patients With Steroid-Refractory Cerebral Radiation Necrosis: An Observational Study of Clinical Indications and Outcomes
- Risk of late radiation necrosis more than 5 years after stereotactic radiosurgery
- Hyperbaric Oxygen Therapy as an Alternative Therapeutic Option for Radiation-Induced Necrosis Following Radiotherapy for Intracranial Pathologies
- Understanding hereditary hemorrhagic telangiectasia: From genetic anomalies to systemic manifestations, quality of life, and epistaxis management-Exploring the otolaryngologist's integral role
- Intracerebral de novo arterio-venous malformations as a side effect of bevacizumab
- Hereditary hemorrhagic telangiectasia
- European Reference Network for Rare Vascular Diseases (VASCERN): When and how to use intravenous bevacizumab in Hereditary Haemorrhagic Telangiectasia (HHT)?

Bevacizumab is not standard treatment for brain AVMs. While the mechanistic rationale exists, the clinical evidence is insufficient, non-conclusive, and potentially risky. It should not replace established treatments (surgery, embolization, radiosurgery) but may be explored in select cases within controlled settings.

Baig Mirza et al. conducted a systematic review of Bevacizumab's role in brain arteriovenous malformation treatment, focusing both on direct treatment attempts and its use in managing radiation-induced complications post-stereotactic radiosurgery (SRS) [1]. Despite a PROSPERO registration and adherence to PRISMA guidelines, the review synthesizes just 12 small-scale studies—primarily case reports, case series, and pilot trials—with no randomized controlled trials (RCTs) or robust cohort analyses.

1. Methodology That Looks Good on Paper…

The authors lean heavily on the PRISMA label and PROSPERO registration to lend the review methodological credibility. However, the input data is alarmingly weak. Including case reports in a systematic review—especially when drawing therapeutic conclusions—is a red flag. The mere formalism of PRISMA cannot rescue a dataset this shallow. Garbage in, garbage out.

2. Selection Bias and Scope Drift

The review claims to examine the role of Bevacizumab in treating bAVMs but spends most of its attention on post-radiation edema and necrosis—a completely different clinical question. Only one included study evaluates Bevacizumab as a treatment for the AVM itself, and even that showed no reduction in nidus size. Therefore, the title and premise of the review are misleading.

3. No Functional or Quantitative Meta-Analysis

This is not a meta-analysis, nor does it even attempt a semi-quantitative synthesis of outcome measures. The use of NIH tools for bias assessment is mentioned but not elaborated in the article or supplement. The result? Readers get a narrative summary of subjective improvements in edema and necrosis, without any pooled statistics, no forest plots, and certainly no confidence intervals.

4. Overreaching Conclusions

The article ends with a soft, meandering conclusion that Bevacizumab “may have a role” in managing post-SRS complications—a vague truism already established in radiation oncology literature for years. Worse, it suggests “further research” as a main takeaway, a lazy academic trope signaling lack of direction or novelty.

5. Scientific Value: Questionable

No new data, no new hypotheses, no clear recommendations, no clinical decision tool. Just a superficial stitching of anecdotal evidence padded in academic language. It neither clarifies Bevacizumab’s role in bAVMs nor adds any practical insight for neurosurgeons facing these lesions in real life.

Final Verdict

This review tries to inflate the clinical relevance of Bevacizumab in brain AVMs based on a precarious base of poor-quality studies. Its inclusion criteria are overly generous, its scope unfocused, and its conclusions more political than scientific. Systematic window dressing for anecdotal evidence—this piece does not withstand critical scrutiny and should not be used to inform treatment decisions. Its publication reflects more on the journal’s editorial standards than on any progress in neurovascular therapy.

 Recommendation: Reject as a reference for any evidence-based guideline. File under: “Academic busywork.”

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Baig Mirza A, Fayez F, Al-Munaer M, Georgiannakis A, Burn L, Ravi K, Vastani A, Syrris C, Patel J, Matloob S. The use of Bevacizumab in the treatment of brain arteriovenous malformations: a systematic review. Neurosurg Rev. 2025 Jun 12;48(1):506. doi: 10.1007/s10143-025-03667-y. PMID: 40504282.