

# Proton beam stereotactic radiosurgery

Although [brain arteriovenous malformations](#) (bAVMs) account for a very small proportion of cerebral pathologies in the pediatric population, they are the cause of roughly 50% of spontaneous [intracranial hemorrhages](#). Pediatric bAVMs tend to rupture more frequently and seem to have higher [recurrence](#) rates than bAVMs in adults. Thus, the management of pediatric bAVMs is particularly challenging. In general, the treatment options are conservative treatment, [microsurgery](#), [endovascular therapy](#) (EVT), [gamma knife radiosurgery](#) (GKRS), proton-beam stereotactic radiosurgery (PSRS), or a combination of the above. In order to identify the best approach to deep-seated pediatric bAVMs, Meling et al., performed a [systematic review](#), according to the [PRISMA guidelines](#). None of the options seem to offer a clear advantage over the others when used alone. Microsurgery provides the highest obliteration rate, but has higher incidence of neurological complications. EVT may play a role when used as adjuvant therapy, but as a stand-alone therapy, the efficacy is low and the long-term side effects of radiation from the multiple sessions required in deep-seated pediatric bAVMs are still unknown. GKRS has a low risk of complication, but the obliteration rates still leave much to be desired. Finally, PSRS offers promising results with a more accurate radiation that avoids the surrounding tissue, but data is limited due to its recent introduction. Overall, a multi-modal approach, or even an active surveillance, might be the most suitable when facing deep-seated bAVM, considering the difficulty of their management and the high risk of complications in the pediatric population <sup>1)</sup>.

<sup>1)</sup>

Meling TR, Patet G. What is the best therapeutic approach to a pediatric patient with a deep-seated brain AVM? *Neurosurg Rev.* 2019 Apr 13. doi: 10.1007/s10143-019-01101-8. [Epub ahead of print] Review. PubMed PMID: 30980204.

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