Arteriovenous malformation nidus

- Is Supplemented Spetzler-Martin grading Superior? A comparative study in AVM microsurgery risk stratification
- A Unique Presentation of Focal Auricular Arteriovenous Malformation: from Embryology to Angiosome Theory
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- Impact of embolization on stereotactic radiosurgery outcomes for intracranial arteriovenous malformations Spetzler-Martin grades III-V: a systematic review and meta-analysis
- Percutaneous transhepatic vascular embolization for a mesenteric arteriovenous malformation leading to decreased portal pressure in a patient with alcoholic liver cirrhosis: A case report
- Simultaneous Multiparametric Estimation of Arteriovenous Malformations Hemodynamics Using MR Fingerprinting ASL (MRF-ASL)
- Long-term outcomes and safety of Gamma Knife radiosurgery in pediatric arteriovenous malformations

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The distinguishing feature of an AVM is that shunting occurs through a collection of tortuous dysmorphic vessels, referred to as a nidus

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A arteriovenous malformation nidus diameter < 3 cm was the independent predictor of a 2-year seizure-free outcome, whereas underlying epilepsy was the factor against a 2-year seizure-free outcome [1)].

A study aimed to explore the potential risk factors of recurrence in angiographically obliterated AVMs treated with endovascular embolization. This study reviewed AVMs treated with embolization only in a prospective multicenter - registry from August 2011 to December 2021, and ultimately included 92 AVMs who had achieved angiographic obliteration. Recurrence was assessed by follow-up digital subtraction angiography (DSA) or magnetic resonance imaging (MRI). Hazard ratios (HRs) with 95% confidence intervals were calculated using Cox model. Nineteen AVMs exhibited recurrence on follow-up imaging. The recurrence rates after complete obliteration at 6 months, 1 year, and 2 years were 4.35%, 9.78%, and 13.0%, respectively. Multivariate Cox regression analysis identified diffuse nidus (Cerebral proliferative angiopathy)(HR 3.208, 95% CI 1.030-9.997, p=0.044) as an independent risk factor for recurrence. Kaplan-Meier analysis confirmed a higher cumulative risk of recurrence with diffuse nidus (log-rank, p=0.016). Further, in the exploratory analysis of the effect of embolization timing after AVM rupture on recurrence after the complete obliteration, embolization within 7 days of the hemorrhage was found as an independent risk factor (HR 4.797, 95% CI 1.379-16.689, p=0.014). Kaplan-Meier analysis confirmed that embolization within 7 days of the hemorrhage was associated with a higher cumulative risk of recurrence in ruptured AVMs (log-rank, p<0.0001). This study highlights the significance of diffuse nidus as an independent risk factor for recurrence after complete embolization of AVMs. In addition, they identified a potential recurrent risk associated with early

embolization in ruptured AVMs [2].

This study makes a valuable contribution to the understanding of AVM recurrence after endovascular embolization. The prospective design, clear outcome measures, and identification of independent risk factors enhance the study's credibility. However, the findings should be interpreted cautiously, considering the limitations in sample size, generalizability, and the need for additional research to elucidate certain associations.

To assess the sensitivity and specificity of arteriovenous malformation (AVM) nidus component identification and quantification using unsupervised machine learning algorithm, and to evaluate the association between intervening nidal brain parenchyma and radiation-induced changes (RICs) after stereotactic radiosurgery (SRS).

Fully automated segmentation via unsupervised classification with fuzzy c-means clustering was used to analyze AVM nidus on T2-weighted magnetic resonance imaging. The proportions of vasculature, brain parenchyma, and cerebrospinal fluid (CSF) were quantified. This was compared to manual segmentation. Association between brain parenchyma component and RIC development was assessed.

The proposed algorithm was applied to 39 unruptured AVMs. This included 17 female and 22 male patients with a median age of 27 years. The median percentages of the constituents were as follows: vasculature (31.3%), brain parenchyma (48.4%), and CSF (16.8%). RICs were identified in 17 (43.6%) of 39 patients. Compared to manual segmentation, the automated algorithm was able to achieve a Dice similarity index of 79.5% (sensitivity=73.5% and specificity=85.5%). RICs were associated with higher proportions of intervening nidal brain parenchyma (52.0% vs. 45.3%, p=0.015). Obliteration was not associated with a higher proportions of nidal vasculature (36.0% vs. 31.2%, p=0.152).

The automated segmentation algorithm was able to achieve the classification of AVM nidus components with relative accuracy. Higher proportions of intervening nidal brain parenchyma were associated with RICs [3].

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