Cerebral Arterio-Venous Malformations: Effect of Partial Embolization on Cerebral Angioarchitecture.

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**Aims:** Endovascular occlusion of brain AVMs is an effective treatment modality in a subset of patients. It has been observed that partial embolization may induce changes of the complex angioarchitecture of AVMs and the surrounding brain: recruitment of new feeding vessels, induction of perinidal angiogenesis and watershed transfer among others. In this retrospective study, we investigate possible signs of such phenomena.

**Methods:** At a single institution 64 AVMs were treated during a 7-year period. To study the effect of partial embolization on the angioarchitecture 19 patients were identified in whom cerebral angiograms prior to and after endovascular treatment were suitable to be analyzed for possible signs of new feeder recruitment, induction of perinidal angiogenesis and watershed transfer.

**Results:** The median follow-up period was 2.5 years (range 0.25 – 6.75 years). Adjuvant microsurgery was performed in 5 patients and radiosurgery in 6 patients. Analysis of DSA series showed possible signs of recruitment of new feeding arteries, signs of perinidal angiogenesis in 5 cases (26%) each and possible occurrence of watershed transfer in 2 cases (11%).

**angioarchitecture of AVMs**

**perinidal angiogenesis**

\textbf{Conclusion:} Possible signs of recruitment of new arterial feeders through watershed transfer and perinidal angiogenesis were observed after partial embolization in some cases. Such changes might influence the microsurgical strategy after embolization.

Patient 12 A-C, patient 3 D-F: A) Anterior-posterior projection of a right ICA injection showing a deep AVM supplied as well by a prominent direct feeder (arrow) originating from the M2 segment, as by indirect feeders. B) Note the distinct reduction of the nidus size after embolization of the feeder. C) Follow-up angiography after 1 year and 2 months showing some recruitment of new feeders originating from the A1 and M1 segment (arrow). D) Oblique projection of a right ICA injection showing a sub-gyral AVM, which is supplied by a direct feeder from the ACA (arrow). E) After partial embolization, possible recruitment of a new feeder from the MCA is observed (arrow). F) Follow-up angiography showing the residual nidus 4 months after embolization.

Patient 16 A-C, patient 8 D-F: A) Lateral projection of a vertebral-basilar angiogram showing a right-sided paracentral gyral AVM (arrow). B) Post-interventional angiography after partial embolization via the ACA with Onyx. C) Follow-up angiography after 4 years and 1 month, showing some signs of new feeder recruitment from the splenial artery (arrow). D) Right ICA angiogram showing a right occipital subar AVM (arrow). E) Post-interventional angiogram after intended embolization through a posterior MCA branch. Note the embolized feeder (arrow). F) Follow-up angiography after 2 years and 10 months showing changes that were interpreted as perinidal angiogenesis (arrow) and watershed transfer (arrowhead).