

AVM Management: Evaluation and Serial Follow up with qMRA

Case No. 018

PHYSICIAN'S CONCERNS?

This young patient has a complex arterio-venous malformation which will require staged endovascular and surgical interventions.

HOW DID NOVA HELP?

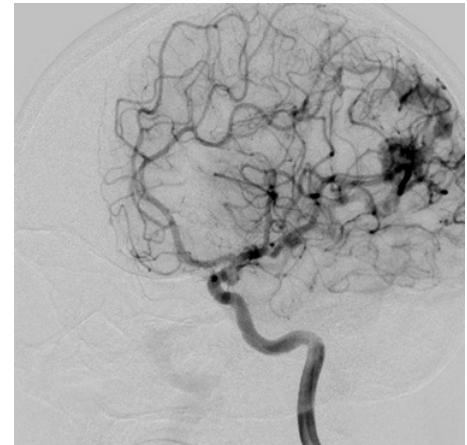
By quantifying the blood flow in the feeding arteries and draining veins, NOVA provided objective evidence that the treatments were effective.

Patient History

- ❖ 28 year old female with SAH and SDH
- ❖ found unresponsive by family
- ❖ CT head from outside hospital shows 3 x 2 x 3 cm L parietal-occipital convexity ICH with interhemispheric SDH and left frontal acute SDH without shift. No HCP. No herniation.

Angio

Shows 16 x 15 x 13.5-mm left parietooccipital AVM being supplied primarily by distal branches of the left PCA and also likely to a minimal extent via distal branches of the left MCA. There is abnormal venous drainage that is superficial as well as deep. Near fetal right PCA.

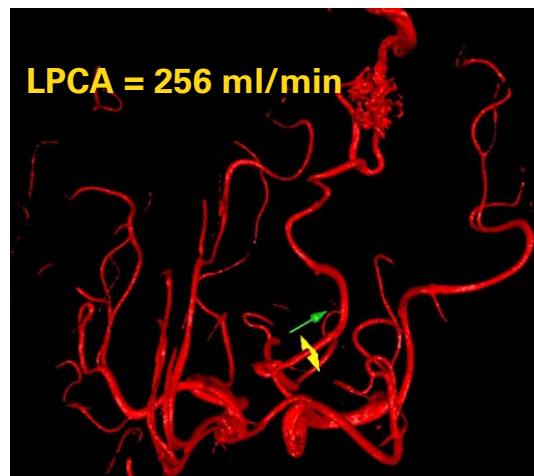
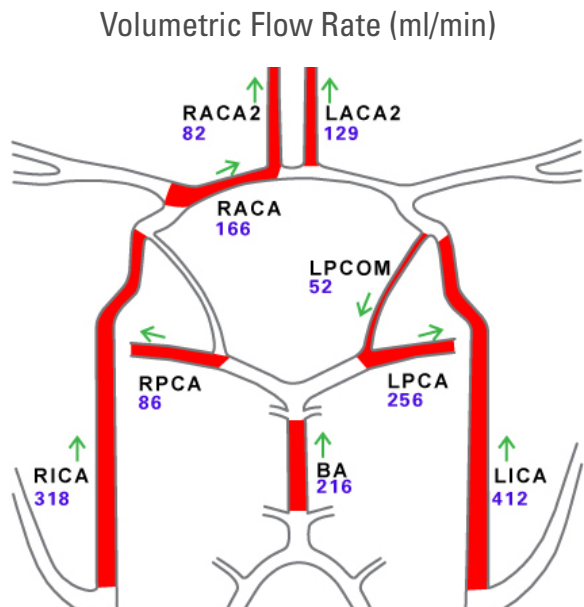


NOVA Baseline Study

Quantitative flow measurements were performed on the cerebral arteries and veins.

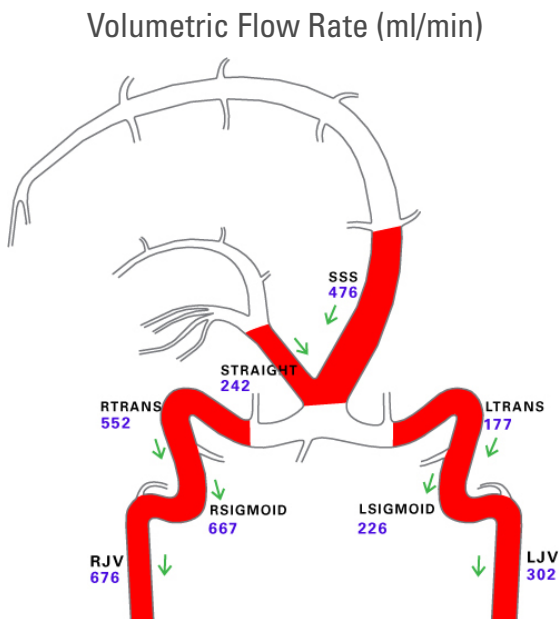
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Cerebral Arteries



AVM being supplied primarily by distal branches of the left PCA

Cerebral Veins

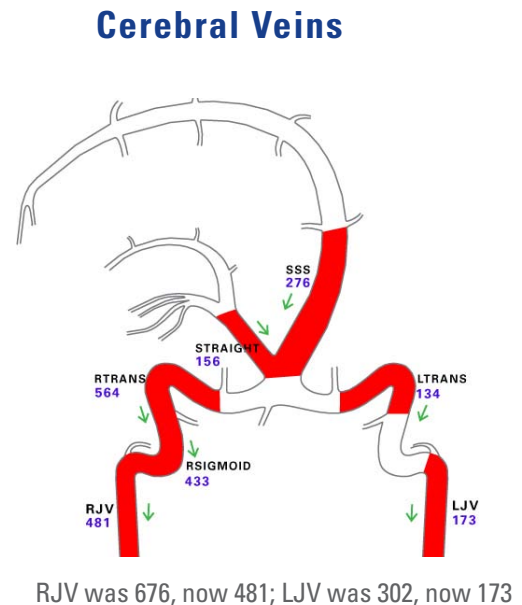
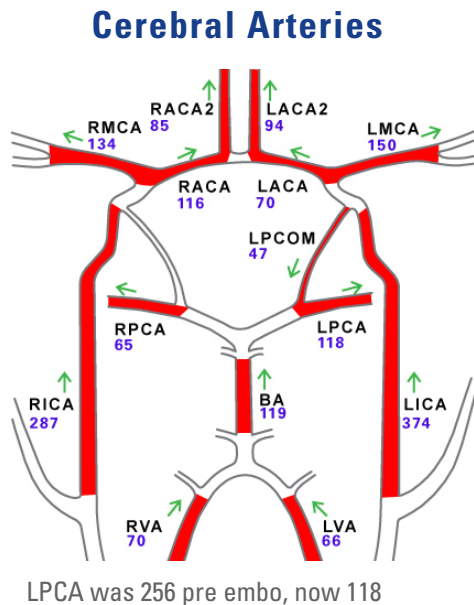


Treatment Course

- ❖ 3 staged embolizations were performed on 9/28/09; 10/19/09; and 11/23/2009 and surgery on 11/24/09.
- ❖ NOVA baseline study on 9/21/09 and after each embolization 9/29/09; 10/20/2009; 11/23/2009, and post op 11/25/2009.

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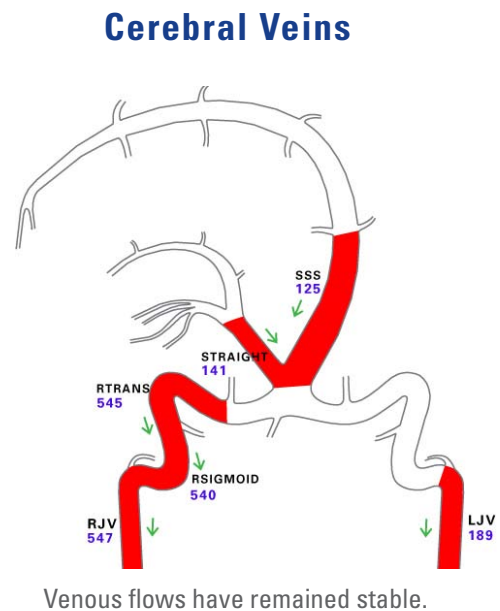
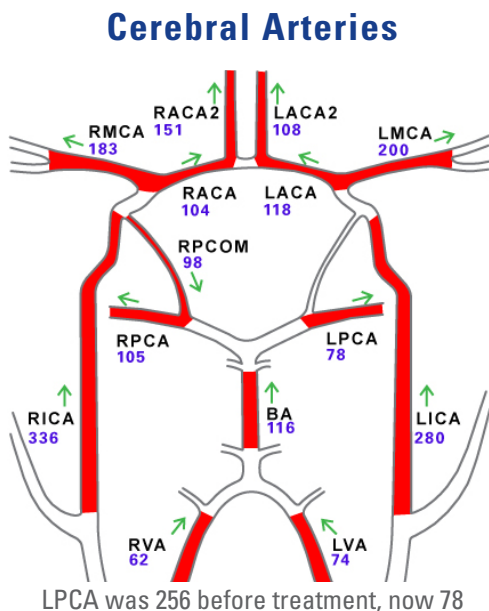
NOVA - after 1st embolization



Management and follow up schedule

- ❖ After the second embolization, arterial and venous flows have remained stable. The patient underwent a 3rd embolization on 11/23/09 and surgery on 11/25/09, 8 weeks after the first embolization.
- ❖ The patient is now cured of her AVM and will be monitored non-invasively with NOVA.

Final NOVA study after three staged embolizations and surgery



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Conclusions

- ❖ NOVA qMRA allows us to quantify volumetric flow rates in feeder arteries and draining veins of the AVM.
- ❖ Quantitative flow measurements establish an individual baseline for the patient and provide the ability to track changes in flow over the course treatment.
- ❖ These measurements allow us to evaluate effectiveness of treatment and assist in the planning of staged interventions.