

Q & A

Q: Was this a high grade BA stenosis?

A: It was never measured but easily appreciable in qualitative terms on the 3D MRA. It appears to be about 50-70%. NOVA showed that flow did not appear to be compromised.

Q: Was this confirmed with angiography?

A: NOVA saved the patient an angiogram since his flow was good and no intervention would have been offered anyway.

Q: How often does the patient receive a follow up NOVA scan?

A: He gets annual follow-up since flows have been stable.

Patient History

- ❖ A 40 year-old Caucasian man with acute onset of dysarthria, left sensorimotor loss and imbalance
- ❖ **Risk Factors:** Hypertension, diabetes mellitus, dyslipidemia, overweight, smoker, strong family history of vascular disease

Diagnostic Workup

MRI/MRA

right pontine infarct & mid-basilar stenosis

nova

adequate BA flow based on the Hanjani Algorithm¹

CTA

confirmed mid-basilar stenosis & post-stenotic dilatation

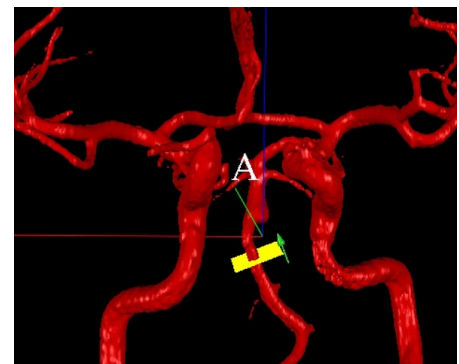


Fig. 1 NOVA 3D surface rendering showing slice plane through the basilar artery.

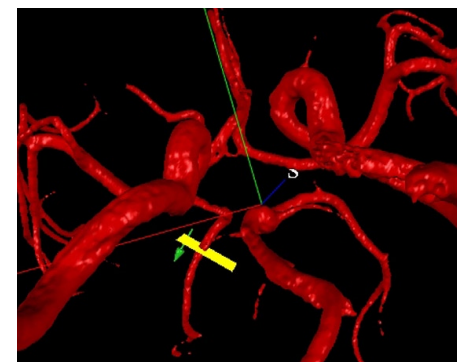


Fig. 2 NOVA 3D showing slice plane through right posterior cerebral artery, which is fetal in origin.

NOVA Report

The flow measurements in the posterior circulation were interpreted on the basis of the algorithm described by Hanjani.¹

The basilar artery flow was 97 ml/min and the flow in the right and left posterior cerebral arteries was 48 ml/min and 62 ml/min, respectively. The right PCA is fetal, therefore only flow in the left PCA was considered in determining flow status. On this basis the patient was classified as having adequate vertebrobasilar flow.

Conclusions

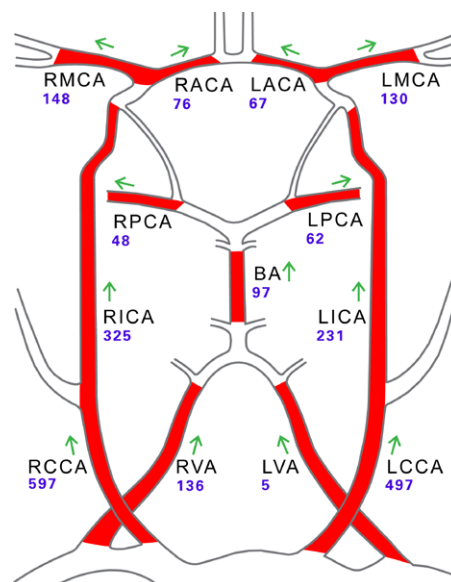
Vertebrobasilar Flow is adequate according to the Hanajani algorithm (BA flow > 120 ml/min or both posterior cerebral arteries > 40 ml/min). Anterior circulation flows are normal. A follow up NOVA study documented anterior to posterior collateral flow of 55 ml/min from the right posterior communicating artery.

40 year old with Mid-Basilar Stenosis

NOVA baseline table

vessel	flow mL/min (%TCF)	range* mL/min
Total Cranial Flow (TCF)	1,235	770-1460
LCCA	497 (40%)	300-550
RCCA	597 (48%)	310-570
LVA	5 (0%)	80-170
RVA	136 (11%)	90-170
LICA	231 (19%)	190-340
RICA	325 (26%)	180-310
BA	97 (8%)	160-260
LMCA	130 (11%)	110-210
RMCA	148 (12%)	100-200
LACA	67 (5%)	60-170
RACA	76 (6%)	60-160
LPCA	62 (5%)	50-100
RPCA	48 (4%)	50-100

NOVA vessel map



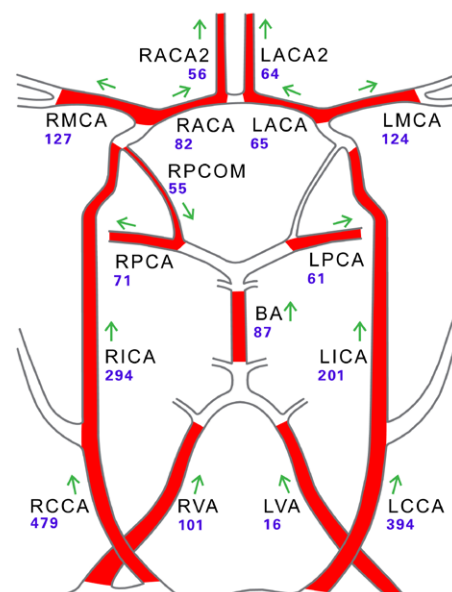
NOVA demonstrated that large vessel posterior circulation flows are not likely to be associated with the patient's symptoms. His basilar artery stenosis is likely a marker of atherosclerotic disease in his small penetrating vessels. On this basis, he was not offered endovascular intervention. He remains symptom-free for > 2 years on medical treatment with antiplatelet agents, Atorvastatin, Niacin, Pioglitazone, angiotensin receptor blocker, and B-Vitamins. He was able to successfully stop smoking with pharmacologic treatment.

Follow up NOVA study 25 months later

NOVA baseline table

vessel	flow mL/min (%TCF)	range* mL/min
Total Cranial Flow (TCF)	990	770-1460
LCCA	394 (40%)	300-550
RCCA	479 (48%)	310-570
LVA	16 (2%)	80-170
RVA	101 (10%)	90-170
LICA	201 (20%)	190-340
RICA	294 (30%)	180-310
BA	87 (9%)	160-260
LMCA	124 (12%)	110-210
RMCA	127 (13%)	100-200
LACA	65 (7%)	60-170
RACA	82 (8%)	60-160
LPCA	61 (6%)	50-100
RPCA	71 (7%)	50-100
RPCOM	55 (6%)	-

NOVA vessel map



¹ Reference: Amin-Hanjani, S., Du X., Zhao M., Walsh K., Malisch, T., and Charbel FT.

"Use of Quantitative Magnetic Resonance Angiography to Stratify Stroke Risk in Symptomatic Vertebrobasilar Disease," Stroke 2005;36:1140-1145

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