

Bilateral Carotid Stenosis

Patient History

- ❖ A 68 year old man was referred for consultation in regards to bilateral carotid stenosis. His carotid disease is asymptomatic and was discovered after the auscultation of a neck bruit by his primary care physician.
- ❖ This prompted a carotid ultrasound which was read as showing greater than 90% stenosis of his left internal carotid artery, as well as a significant contralateral stenosis of the right internal carotid artery.
- ❖ The patient has never had symptoms of TIA or stroke. He does have a family history of stroke, however, and a personal history of dyslipidemia and renal insufficiency.

Treatment Options

- ❖ Bilateral carotid endarterectomies were recommended on this basis.
- ❖ The patient's cardiologist was reluctant to clear him for surgery without an MRA and he was referred to the University of Illinois Medical Center at Chicago for an MRA with NOVA.

NOVA Report

- ❖ The patient received a NOVA quantitative MRA angiographic study of the head and neck vessels. The results of the NOVA study are summarized on the Vessel Map and Baseline Table (Figures 1 and 2).

VESSEL	FLOW (mL/min)	AGE 18-40*	AGE 41-60*	AGE ≥61*
LCCA	380	254-580	233-523	180-562
RCCA	332	222-590	221-543	172-590
RVA	159	-	-	-
TVA	159	94-300	99-281	76-270
LICA	230	169-379	135-365	110-352
RICA	202	147-377	120-362	92-344
BA	50	101-231	76-224	77-181
LACA	77	-	-	-
RACA	42	-	-	-
TACA	120	98-274	95-247	83-229
LPCA	59	35-113	40-98	34-88
RPCA	61	34-108	34-94	31-85
RMCA	112	86-230	83-205	67-193
LACA2	48	41-119	25-109	25-111
RACA2	51	41-113	33-103	31-101

Figure 1: NOVA Baseline Table. Patient's flow rates and age adjusted normal ranges. Data presented at the 2008 International Stroke Conference, New Orleans, LA

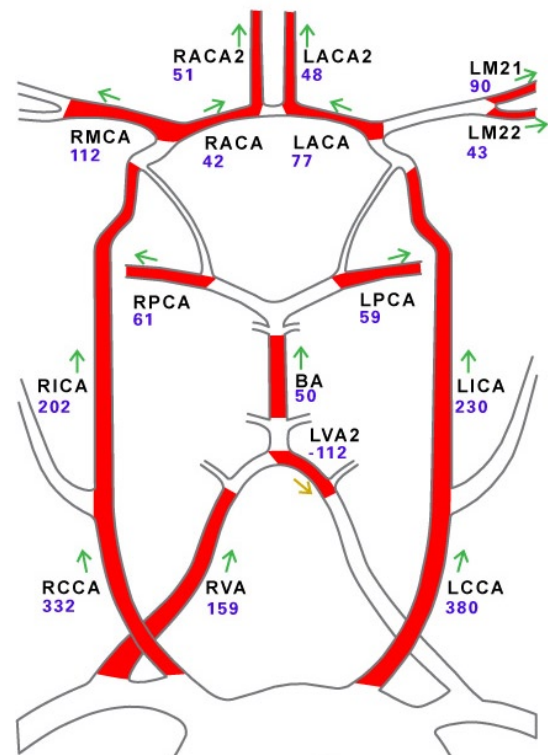


Figure 2: NOVA Vessel Map. A schematic of the blood vessels showing individual vessel flow rates in milliliters per minute and arrows indicating direction of flow.

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Findings

- ❖ NOVA revealed normal flows in the anterior circulation and no significant stenosis of the left internal carotid artery. This was at odds with the reported greater than 90% stenosis of the LICA as determined by the ultrasound.
- ❖ In fact, the stenosis on the left side was located on the external carotid artery and not the internal carotid artery as initially suggested by the Ultrasound.
- ❖ There was also 60% stenosis of the right internal carotid artery at the neck.
- ❖ An incidental finding was the reversal of flow in his left vertebral artery secondary to a left subclavian artery occlusion. He does not however have basilar steal as the flow in his basilar artery is antegrade (Figure 3 & 4).

Conclusions

- ❖ The natural history of asymptomatic carotid artery stenosis was discussed and the pros and cons of the carotid endarterectomy were debated in regard to a relative risk reduction of about 50% at 5 years of stroke and an absolute risk reduction of about 1-1.2% per year for 5 years.
- ❖ The left side, of course, does not warrant any consideration for intervention since there is no significant stenosis of the internal carotid artery and his flows are normal.

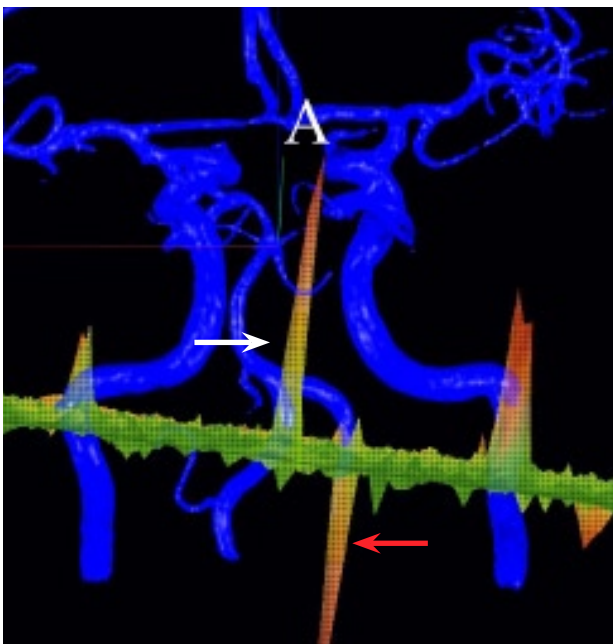


Figure 3: NOVA 4D. Visualization of the plane at the level of the vertebral arteries shows antegrade flow in the right vertebral artery (white arrow) and reversal of flow in the left vertebral artery (red arrow).



Figure 4: NOVA 3D. Green arrow indicates direction of flow is antegrade in the basilar artery.