

Internal carotid artery stenosis with impending occlusion



Preoperative angiogram and NOVA 3D Model

PHYSICIAN'S CONCERNS?

Worsening carotid stenosis in a patient with a history of vascular disease and multiple interventions.

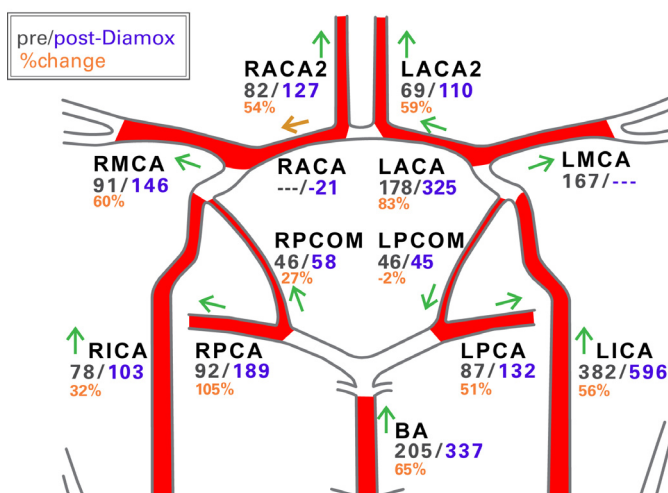
HOW DID NOVA HELP?

NOVA quantified the amount of blood flow the patient would lose if the carotid were to occlude.

Patient History

- ❖ A 65 year old, right handed woman had an episode of unusual gait and fell to her knees. Her symptoms resolved within 5 minutes. She was seen in the ER and diagnosed with a TIA.
- ❖ Past Medical History includes right internal carotid artery stenosis 60%, subclavian stent and left carotid stent as well as angioplasty on her right leg, all related to her vascular disease from several years ago.
- ❖ She was admitted for an angiogram. A repeat of her studies showed a worsening of the RICA stenosis, which now appears to have progressed to complete occlusion.

NOVA Vessel Map



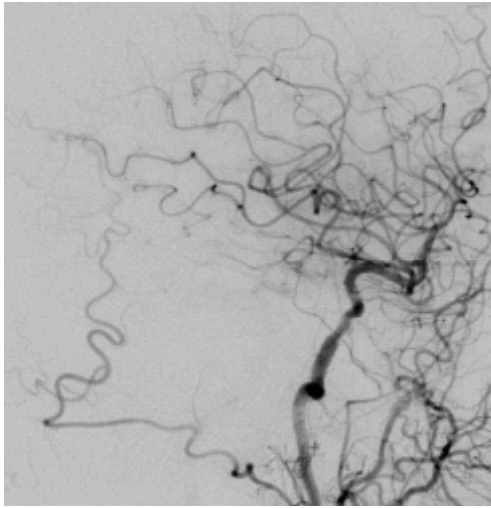
NOVA Findings (NOVA Vessel Map, Left)

- ❖ RICA flow is low compared with the left side:
RICA = 78, LICA = 382 ml/min
- ❖ RMCA flow is also relatively low:
RMCA = 91, LMCA 167 ml/min
- ❖ The Right A1 is hypoplastic, ruling out the anterior communicating artery as a source of collateral. The RPCOM flows anteriorly and supplies 50% of total RMCA flow.
- ❖ After diamox the right MCA flow increases, while there is a correspondingly poor response in the RICA, thus confirming the functional limitation of the stenosis.

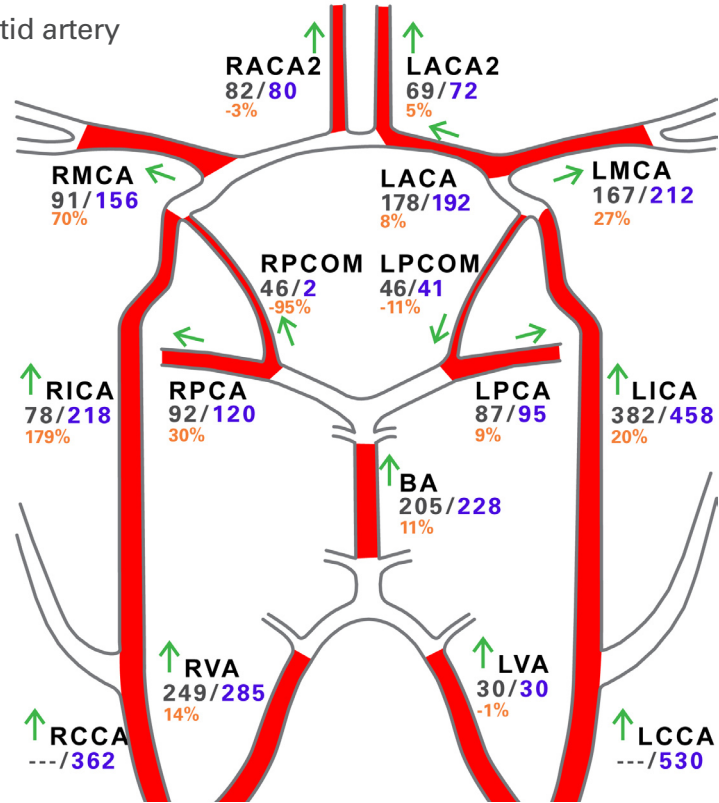
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Treatment Plan

Angioplasty and stenting of right internal carotid artery



Post op angiogram



NOVA Comparative Map Pre/Post RICA angioplasty and stenting

NOVA guides Management

While the majority of patients with carotid occlusion are well compensated by collateral flow, in this case, the absence of a right A1 limits the available collateral pathways. The RPCOM flow is insufficient to maintain flow symmetry between the Right and LMCA as shown by NOVA. If her RICA were to occlude, the reduction in right hemispheric blood flow would likely cause a major stroke.

Conclusions

- NOVA shows quantitatively how much flow the patient would lose, 78 ml/min, if the carotid occludes.
- NOVA supports a revascularization strategy to increase RICA blood flow.
- NOVA documents a successful intervention and quantifies the improvement in RICA flow.
- NOVA provides a post surgery baseline for non-invasive follow up.