



Carotid Artery Disease: What to do when there is restenosis of carotid artery after revascularization?

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Purpose

Carotid atherosclerosis frequently occurs at the origin of the internal carotid artery at or just above the bifurcation of the common carotid artery and involves the carotid bulb. Plaque buildup results in the narrowing of the artery; which can lead to stroke or transient ischemic attack. Treatment options for symptomatic carotid artery stenosis are carotid endarterectomy (CEA), carotid stenting (CAS), as well as medical management. ³ CEA is indicated in those symptomatic patients with 50% to 99% internal carotid stenosis; whereas CAS should be considered in symptomatic patients with a 50% to 99% internal carotid stenosis with a medical or anatomic contraindication to carotid endarterectomy. The CREST Trial showed that 6% of patients undergoing CEA or CAS will demonstrate restenosis by 2 years postoperatively. ⁴ Intrinsic and extrinsic injuries, intimal hyperplasia and vascular smooth muscle cell proliferation are the mechanisms for restenosis. ² It is recommended that patients with severe restenosis be considered for carotid artery stenting. ⁴ The purpose of this case study is to demonstrate that CAS is appropriate to do after restenosis of carotid stent.

Case report

We identified a patient with a past medical history of laryngeal cancer treated with a partial laryngectomy and radiation therapy in 2000. He was referred in 2009 to a vascular surgeon for radiation induced left carotid stenosis where his initial lesion was close to 90%. He underwent a carotid stent at that time. Post-operatively, he was evaluated on a yearly basis with a carotid duplex. There was no significant change until 2019; where the duplex demonstrated elevated velocities to suggest a restenosis. It was confirmed on a CT angiogram. Carotid endarterectomy was not indicated in this patient, because he underwent cervical irradiation. Radiation makes it difficult to dissect and mobilize the carotid vessels. It is also challenging to find the cranial nerves. ¹ Therefore, it was decided that he should undergo a transfemoral left carotid artery stent.

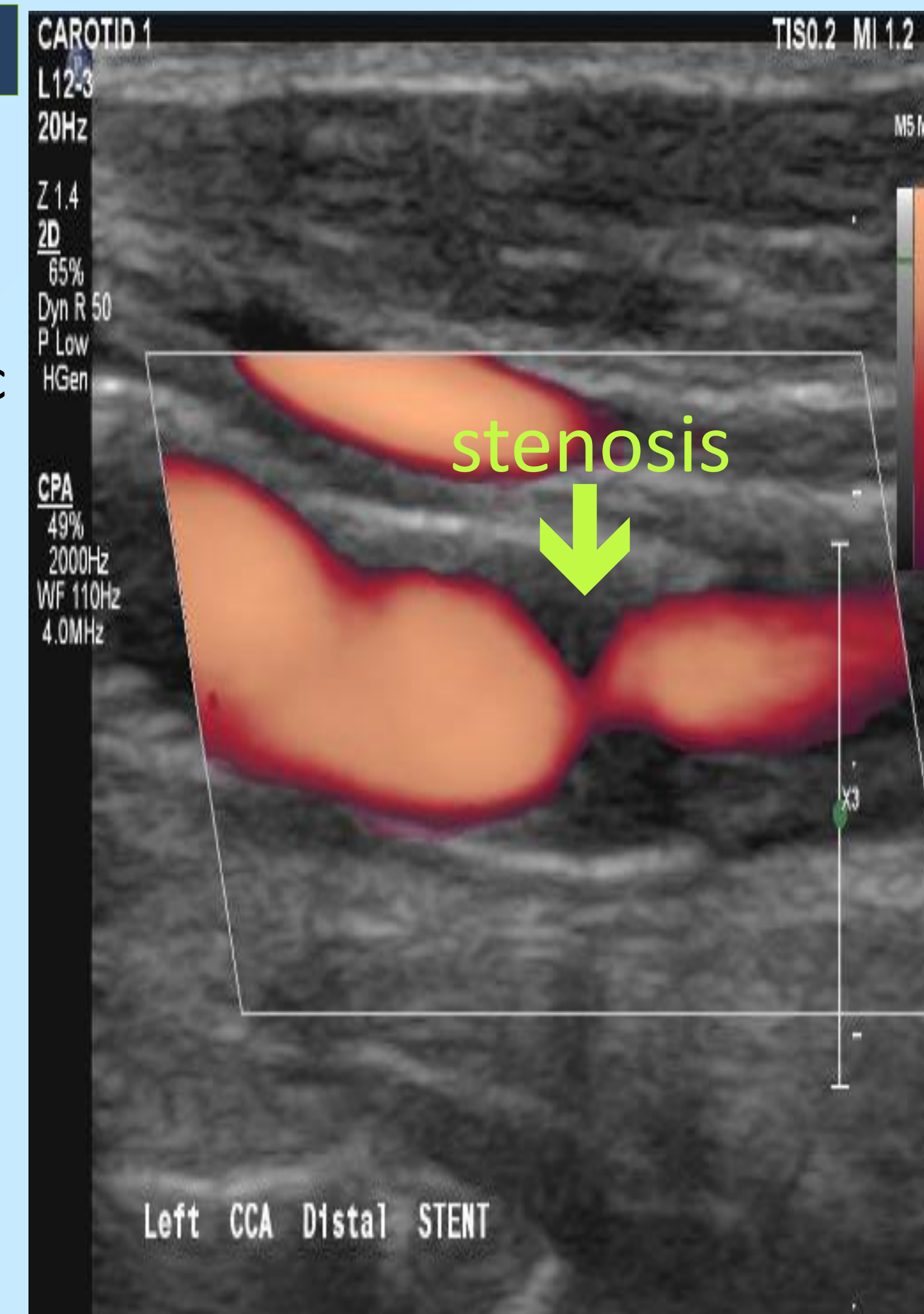


Figure 1: Pre-procedure carotid duplex

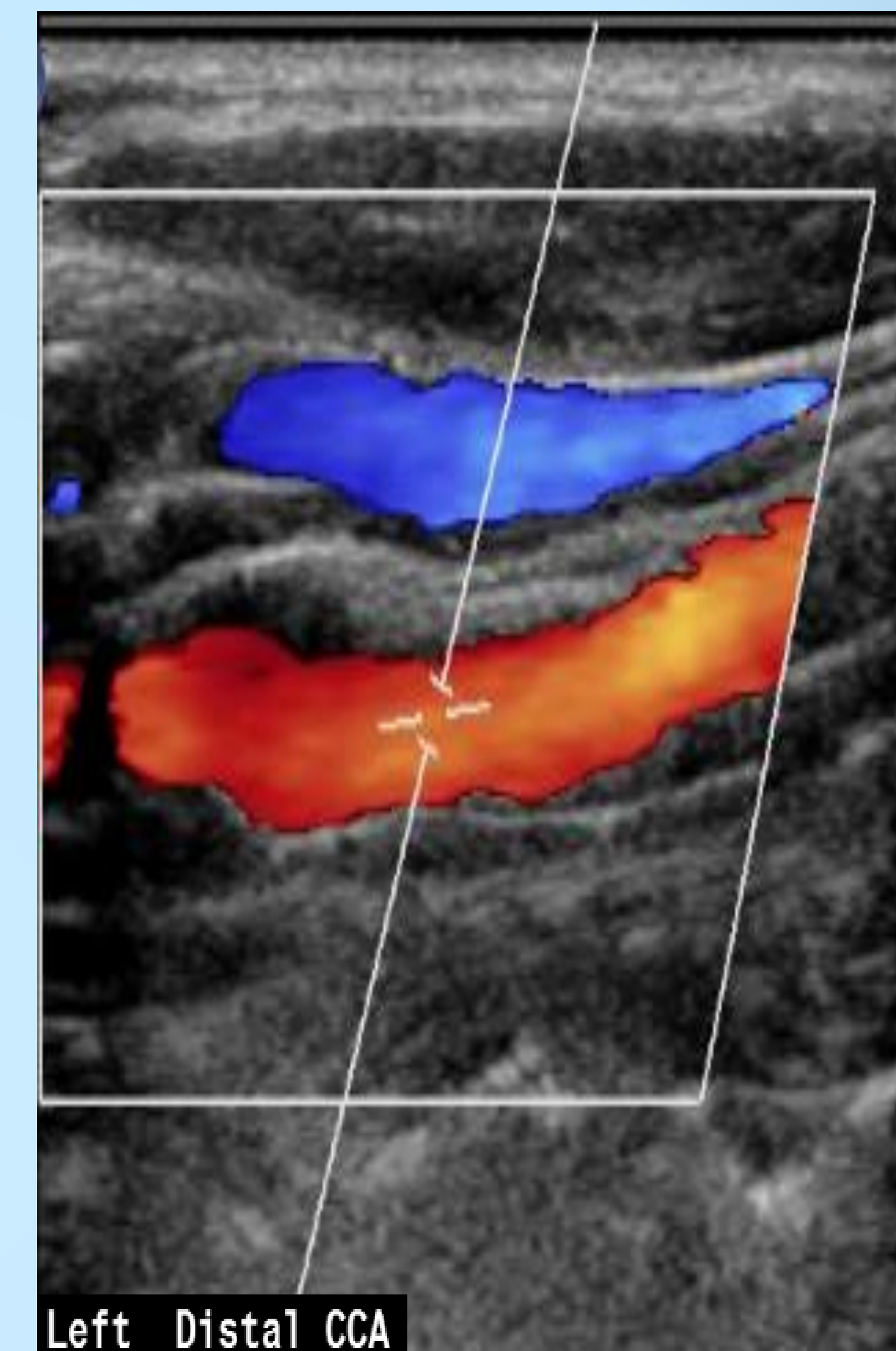


Figure 2: Post-procedure carotid duplex

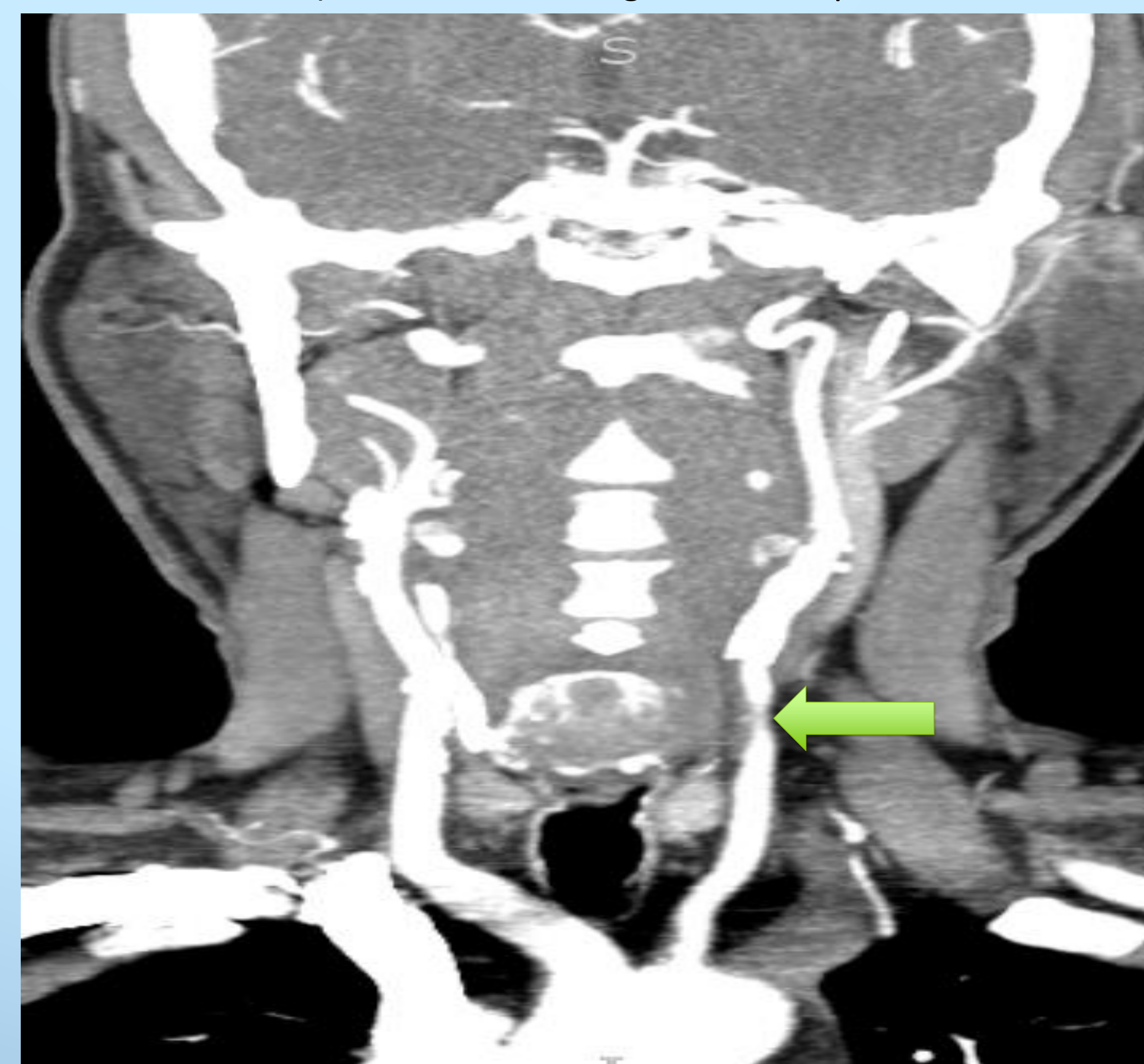


Figure 3: CTA showing artery distal to stent reduced in caliber due to reduced flow

Discussion

A carotid duplex demonstrated increased velocity at the proximal portion of his stent, which was in the high-grade range with a peak systolic velocity of 563 centimeters/second (Figure 1). A CT angiogram also showed 75% stenosis at the proximal portions of the stent. The artery distal to the stent was reduced in caliber due to reduced flow (Figure 3). These studies confirmed restenosis of the patient's carotid stent. It was indicated that he undergo a transfemoral left carotid artery stent.

Conclusion

There is a small percentage of patients who have restenosis after carotid artery stent placement in the 2 years after revascularization. ² Although this patient wasn't a candidate for an open repair with carotid endarterectomy; he was appropriate for endovascular repair. Carotid stent is an appropriate surgical option for those patients who have restenosis after revascularization.

References

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