

The Impact of TCAR on Patient and Physician Experiences

Written by Heath Broussard, MD, FACS

The Jackson Clinic; Jackson, TN

Why TCAR?

I am an early adopter who has been performing the TCAR procedure now for five years. I have performed over 300 thus far, and I currently proctor physicians on their first cases. I am always asked how TCAR fits into my carotid practice. The answer is easy for me: I am a TCAR First Operator.

If a patient meets criteria for TCAR, he or she will be offered TCAR and carotid endarterectomy (CEA). I recommend TCAR to my patients and explain why I believe it is a superior therapy for him or her. Patients who do not meet criteria for TCAR are offered conventional carotid endarterectomy.

My list of reasons for being a TCAR First Operator align with those of most believers in the technology. Firstly, the data speaks for itself. Perioperative stroke risk for TCAR is equivalent to even the best endarterectomy stroke risk.¹ This

is true both in real world private practice and new adopter experience as noted in the VQI registry.^{2,3} Real world stroke risk is consistent in the VQI and the TCAR ROADSTER 1 trial.³ The second part of why I trust TCAR for my patients is that the long term durability of the procedure is virtually identical to CEA.⁴ Thirdly, TCAR is truly less invasive for the patient than CEA. To the average vascular surgeon, outside of endovascular procedures, CEA is less invasive than most of the other open surgical procedures typically performed. Relatively speaking, CEA requires a small incision, the patient stays in the hospital one night, and returns to function fairly rapidly, especially when compared to an open AAA procedure or fem-distal bypass. However, the next time you do a TCAR on one side for a patient, but then do a CEA on the other side because that lesion does not meet criteria, you will be surprised at the difference in patient experience for TCAR vs. CEA. In my experience, 100% of my patients treated with both TCAR and CEA tell me they hope they never have to have CEA again. They all stated that the TCAR procedure was much more tolerable and the time to full recovery was significantly quicker. The next reason why I prefer TCAR over traditional endarterectomy (if the patient meets clinical criteria) is a key reason for this article.

The simple truth is that TCAR is just easier on me as a physician. What do I mean by this? The average TCAR takes me 40 minutes to perform, compared to approximately 80 minutes for CEA. The cutdown takes 5 minutes. The average clamp time is about 6 minutes, and the closure requires removing a sheath and tying a pre-placed suture. The rest of the time is spent connecting components, waiting for device opening/prepping, and washout time. For most of the case, I am standing up straight and my head is up looking around the room or at a fluoro screen. I am only physically dissecting, ballooning, and stenting for about 11 minutes.

Whereas while doing a CEA, I may need to focus on the wound for at least 40-50 minutes with my head and eyes pointed down using my loupes. This surgeon yoga pose is held longer if you take into account a slightly longer dissection time, time for the clamp and endarterectomy, and time for the suturing of the patch. The rest of the procedure time is spent waiting for needle holes to stop bleeding and hopefully no other issues that can add unfortunate complexity and time. I may not want to admit it, but I am aging. Sadly, we all are. My desire to do a 3-5-hour major open vascular case is vastly different today vs. 20 years ago. Why? It simply hurts more. The toll those long cases take on my body is painful. I definitely feel it at the end of the day - especially if I've had 2 big cases. My personal physical recovery time is longer now than 20 years ago. The question in my mind as I nurse my battle



“ I will always first choose the procedure that is easier and less invasive for the patient and lastly, the procedure that will do less harm to my body and overall well-being. ”

wounds after a long day is “why did I just do that huge case? Was there a better option?”

Although age and experience have made me more skilled now than ever, I am grateful I can do those big cases more rapidly with better technique and outcomes than I ever could 20 years ago. My skillset, technology, and training have improved. The part that I cannot change is time. The stresses we as surgeons put on our bodies when we perform these long cases is cumulative. As we stare down and through loupes, we put an unfortunate strain on the cervical spine. This puts vascular surgeons at a higher-than-average risk of cervical disc herniation, often requiring surgery. My Neuro and Orthopedic Surgery colleagues suggest this risk exists and a recent publication on ergonomic postural risk (EPR) for musculoskeletal posture of vascular surgeons performing open and endovascular procedures suggests that we, as a specialty, are not immune.⁵ The contortion of my body to sew a patch on for 30 minutes takes a toll on my back and my neck. This is especially true if the anatomy is complicated and visualization is difficult (i.e., high lesion). Again, I hate to admit it, but the old body just isn't what it used to be. Maybe I should do more yoga. I will save that for a future article.

Realistically, I will be practicing surgery for another 10-15 years. How will my body feel and perform over the next decade if the large majority of the procedures I perform put significant physical stress on my neck, back, and joints? Time, wisdom, and age have forced me to consider how performing a procedure for a patient will affect my body. So, my answer is easy. When two procedures have equal outcomes, both in the perioperative period as well as long term, I will always first choose the procedure that is easier and less invasive for the patient and lastly, the procedure that will do less harm to my body and overall well-being. Why should I stress the patient and myself more than necessary when there is an alternative with equal or better benefit now and in the future? For these reasons, I will continue to consider TCAR first when presented with a patient requiring carotid intervention.



References

1. Kwolek CJ, et al. Results of the ROADSTER multicenter trial of transcatheter stenting with dynamic flow reversal. *J Vasc Surg.* 2015 Nov;62(5):1227-34.
2. Kashyap VS, King AH, Liang P, et al. Learning Curve for Surgeons Adopting Transcatheter Artery Revascularization Based on the Vascular Quality Initiative-Transcatheter Artery Revascularization Surveillance Project. *J Am Coll Surg.* 2020;230(1):113-120. doi:10.1016/j.jamcollsurg.2019.09.020
3. Schermerhorn ML, Liang P, Dakour-Arifi H, et al. In-hospital outcomes of transcatheter artery revascularization and carotid endarterectomy in the Society for Vascular Surgery Vascular Quality Initiative. *J Vasc Surg.* 2020;71(1):87-95. doi:10.1016/j.jvs.2018.11.029
4. Brott TG, Howard G, Roubin GS, et al. Long-Term Results of Stenting versus Endarterectomy for Carotid-Artery Stenosis. *N Engl J Med.* 2016;374(11):1021-1031. doi:10.1056/NEJMoa1505215
5. Davila VJ, Meltzer AJ, Fortune E, et al. Intraoperative ergonomics of vascular surgeons. *J Vasc Surg.* 2021;73(1):301-308. doi:10.1016/j.jvs.2020.04.523



Heath Broussard, MD, FACS is a general and vascular surgeon in Jackson, TN. He has been employed by The Jackson Clinic PA for 22 years and works at Jackson-Madison County General Hospital since completing residency at UAMS in Little Rock Arkansas. Dr. Broussard's practice is comprised of general, vascular, and endovascular surgery.