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Exploring the Role of Transcarotid Artery Revascularization in Treating Carotid Stenosis

Presented by Peter Schneider, MD, FACS

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Clinical insights on the use of transcarotid artery revascularisation (TCAR) for treating carotid artery stenosis were provided at LINC 2022 on Monday afternoon by Peter Schneider, MD, FACS, Professor of Surgery in the Division of Vascular & Endovascular Surgery at the University of California, San Francisco. In his talk, Dr. Schneider advised on patient selection and procedural technique, and gave his perspective on the role of TCAR in contemporary practice.

“During TCAR, neuroprotection is achieved by proximal common carotid artery occlusion, with flow reversal through a flow circuit which shunts blood from the common carotid artery into the common femoral vein," he said. "This results in continuous backflow to prevent emboli from reaching the brain. This form of protection has turned out to be well tolerated and is extremely effective at preventing particulate material from embolizing to the brain.”

In light of this effective embolic protection, Dr. Schneider reported that TCAR has a favorable safety profile; it also provides a middle-of-the-road option in terms of invasiveness compared to the other available procedures. “TCAR is more invasive than TFCAS, but appears to be dramatically safer from a neurologic standpoint,” he said. “Compared to CEA, it is less invasive and has a reduced risk of cranial nerve injury and myocardial infarction.”

Characterizing the safety profile of TCAR in more detail, Dr. Schneider referred to the large body of research evidence that has amassed over the last few years. “The key studies on TCAR have included more than 30,000 patients to date,” he stated.

“PROOF was an early TCAR study conducted in Germany, which revealed that the rate of new lesions on diffusion-weighted-MRI after TCAR was comparable to after CEA, and dramatically less than after TFCAS. Further encouraging data on TCAR was provided by a series of prospective neurologically adjudicated studies including the ROADSTER Trial, ROADSTER Continued Access Study and ROADSTER 2 Trial, which altogether enrolled more than 800 patients.”

Commenting on data from the ROADSTER and ROADSTER 2 trials, Dr. Schneider observed that both early outcomes and 1-year outcomes were favorable. While these single-arm studies did not compare TCAR with other treatment options, he noted that encouraging comparative data has been provided by the TCAR Surveillance Project of the Society for Vascular Surgery Vascular Quality Initiative, a prospective database used in several hundred hospitals in the USA. “More than 30,000 TCAR patients have been entered and compared to more than 70,000 CEA patients, and no significant difference in the risk of stroke and death has been found,” he summarized.

Dr. Schneider believes that we have a good basis for incorporating TCAR into treatment protocols. A randomized controlled trial may not be the natural next step. “If you take the very low risk of stroke and death found in the ROADSTER series, alongside the data from thousands of patients in the Vascular Quality Initiative (VQI), it likely becomes futile to consider a randomized controlled trial,” he commented. “One estimate put the number of patients required for an adequately powered trial at 54,000 in each treatment arm.”

After discussing the research landscape regarding TCAR, Professor Schneider moved on to consider patient selection, highlighting that the optimal use of TCAR depends upon identifying which patients this procedure will be most appropriate for. “It’s all about matching up the right patient to the right procedure,” he noted.

“Patients with severe and circumferential calcification of the carotid bifurcation which is not amenable to stent placement, and those with a very low bifurcation or significant disease at the common carotid access site, should be considered for CEA. Those with a very distal bifurcation or severe neck immobility should be considered for TCAR. Many patients, if not most, can be treated with either.”

Moving on from patient selection, Dr. Schneider briefly touched on technical factors that can make the TCAR procedure smoother and safer – a topic he elaborated on in more detail in his talk. "The most important thing during this procedure is safe placement of the sheath," he stated. "Once that has been done, and there is a stable platform for treatment, stent placement is greatly facilitated."

Dr. Schneider closed by emphasizing his positive perspective on the role of TCAR in clinical practice. "Overall, TCAR has repeatedly been shown to be superior to TFCAS. TCAR has equivalent stroke and death risks to CEA, but it has the benefit of being less invasive."