"Global vascular guidelines on the management of chronic limb-threatening ischemia" is an important milestone, but some questions remain

We have read with great interest the very much needed and expected guidelines on the management of chronic limb-threatening ischemia (CLTI).[1] Knowledge on how to serve best the CLTI patients lacked joint expert update and guidelines set forward by the Authors deserve deep appreciation.

However, in our opinion, some of the recommendations provided by the authors require further refinement.

Our first concern is the way the global limb anatomic staging grade is performed for infrapopliteal (IP) arteries. As the authors rightfully state, in very advanced femoropopliteal disease, some of the patent IP arteries may not become opacified when the dye is injected at the level of proximal arteries. It may be necessary to recanalize the femoropopliteal segment first and inject the dye into the distal popliteal artery to obtain a candid picture of the IP arteries. Accordingly, IP global limb anatomic staging evaluation based on preprocedural angiographic imaging may overestimate the grade and even lead to an erroneous conclusion that the patient is technically unsuitable for any revascularization.

Also, some aspects of the presented concept of the IP target artery pathway (TAP) revascularization may be difficult to accept. The article states that the "TAP is generally selected on the basis of the least diseased crural artery providing runoff to the foot." The fibular artery is often the least affected IP vessel and usually provides some branches to the foot. A guideline might be understood the way that the fibular artery should be preferentially chosen for IP revascularization. Most patients with CLTI, however, feature forefoot ischemic lesions and, in these cases, the hemodynamic effects of fibular artery revascularization will in most instances not equate with tibial artery revascularization. Usually, the diameter of the distal tibial artery is 2.5 mm. The cross-sectional area of a 2.5 mm tube equals almost three 1.5-mm tubes, more than six 1.0-mm tubes, and twenty-five 0.5-mm tubes. Because distal branches of the fibular artery are usually scarce and relatively narrow, even optimal revascularization of the fibular artery might be insufficient to provide sufficient blood flow to the ischemic forefoot. We acknowledge the fact of various approaches to foot revascularization. Additionally, the available evidence is not adequate to back any one of these. We only stress the fact that hemodynamics is essential, and that the number and size of distal fibular branches should be taken into account when choosing the TAP in forefoot lesions.

Finally, how should we proceed if we fail to recanalize the IP artery initially chosen to become the IP part of the TAP, but succeed to open another artery and eventually provide sufficient inflow to the foot arteries? It is quite frequent that we are unable to recanalize our first-choice artery, but can recanalize our second or even third choice IP artery, although in our initial assessment we thought they were less suitable for recanalization for being more diseased or with lesions more challenging to cross. Should we then regrade the patient or stick to the primary grade?

We think this issue requires additional clarification to obtain comparable results between different centers involved in endovascular revascularization.

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REFERENCE

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https://doi.org/10.1016/j.jvs.2019.08.267

Reply

We thank the correspondents for their review of the Global Vascular Guidelines document and their thoughtful questions on the application of the new anatomic staging system (Global Limb Anatomic Staging System [GLASS]) proposed for chronic limb-threatening ischemia (CLTI). Indeed, the authors of the guideline acknowledge the need for prospective critical evaluation of the new staging systems (both clinical and anatomic) to improve data comparisons and evidence-based treatment approaches. In the case of GLASS, the key element in this advance is the integration of lesion complexity across the limb from groin to foot, which we believe is central to the selection of an optimal revascularization strategy in CLTI.

Regarding the specific questions raised, the authors first point out the potential challenges associated with optimal angiographic imaging to define the tibial and pedal target vessels, particularly in the presence of proximal disease. In this regard, angiographic techniques are not standardized in relation to catheter position, contrast material volume, use of power injection, timing, projections, image resolution, and capture. We are unable to make specific recommendations on these important elements. However, the guideline points out that

adequate angiographic imaging including the ankle and foot is a fundamental prerequisite for defining candidacy and strategies for revascularization in CLTI. This implies that the imaging must be sufficient for the evaluation of open bypass options. In our opinion, this seldom would require beginning with a femoropopliteal intervention as patent distal targets are filled from collaterals. There is a note of concern that the era of endovascular intervention has potentially led to deterioration in the quality of diagnostic arteriography.

The selection of the primary target artery pathway (TAP) in each case is based on both the anatomy and clinical circumstances at hand. As the guideline mentions, it may often be the least diseased outflow vessel, but the TAP may also be selected on the basis of preference for a specific angiosome or other technical factors. There are no well-established criteria in this regard for either open or endovascular intervention. It is, however, worth pointing out that open bypass to the peroneal artery has a substantial track record of success in diabetic limb salvage, including healing of transmetatarsal amputations. More evidence is needed to define optimal TAP selection and also the potential role of multivessel revascularizations in CLTI.

The last important point raised relates to choosing a secondary TAP when the primary target could not be successfully treated. This is really a question for data reporting and outcomes comparisons. In prospective studies, both the primary artery attempted and the secondary artery treated should be reported for analysis, in the first case because the incidence of technical failure is important to document and helps to validate GLASS infrapopliteal grades and stages. However, downstream clinical outcomes should be compared on the basis of the revascularization as performed. If more than one infrapopliteal artery is treated, the interventionalist should document which was considered the primary target for the case.

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https://doi.org/10.1016/j.jvs.2019.09.025

Transcarotid artery revascularization is moving from its infancy to childhood

Transcarotid artery revascularization (TCAR) has received its U.S. Food and Drug Administration approval, has garnered additional substantiation by the study of Kashyap et al,[1] and thus is moving from its infancy to childhood phase with real-world results on the horizon. The authors are to be congratulated on expanding our present knowledge in the area of carotid intervention. However, there is concern that the safety and effectiveness outcomes associated with TCAR could decline as it moves into the real world. Some of these concerns center on the strict inclusion and exclusion criteria, medication adherence, and device learning curve. Importantly, the low event rates for the Kashyap study are comparable to those found in the pivotal Safety and Efficacy Study for Reverse Flow Used During Carotid Artery Stenting Procedure (ROADSTER)[2] and also for a much larger Society for Vascular Surgery Vascular Quality Initiative containing 1182 TCAR cases.[3] The early results shared by Kashyap and colleagues suggest that the TCAR procedure is a carotid intervention that can be mastered in a very short time (ie, five or fewer training cases), and it has been found to lower the risk of cranial nerve injury.

As we move forward and the news of the device begins to fade and less attention is paid to trial adherence, will the low event rates remain? Indeed, Paraskevas et al[4] likewise have proclaimed a similar concern regarding the discordance between randomized trials and real-world results within the field of vascular surgery. Moreover, there are ongoing concerns about the appropriateness of TCAR interventions in patients with severe or occluded contralateral lesions, whereas these patients were excluded in the experimental trials.[2] Although cranial nerve injury was lower than the 6% reported by the Carotid Stenting Trialists' Collaboration,[5] there remains the possibility of lymphatic leak on the left side from injury to the thoracic duct or vagus nerve injury. So, despite TCAR's having successfully survived infancy, awareness, caution, and expertly deployed mitigating countermeasures will enhance this promising therapy's likelihood of a promising childhood.

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