Duplex Scan Evaluation of Carotid Stenosis. Which Consensus is Necessary?

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During the past several years Carotid ultrasound has assumed an even greater role in the diagnosis of carotid stenosis and has been adopted as the first line preoperative test. It is advisable that each ultrasound laboratory should undertake regular validated comparisons between Duplex and angiography before systematic Duplex practice, especially when new machines or technologists arrive. Unfortunately, there is no general consensus on what constitutes the exact gold-standard for Duplex evaluation. This has been evidenced by the survey described in the article of Walker and Naylor published in this number of EJVES.\(^1\) The Authors sent a questionnaire to assess which Duplex criteria were most commonly used to define carotid stenosis among members of the Society of Vascular Technology of Great Britain and Ireland: astonishingly, the majority of technologists did not know which measurements method was used in their unit. Furthermore, despite both the above countries were the largest contributors to ECST, most of the responders were using criteria that were more consistent with a NASCET than an ECST classification.

In the face of redefinition of indications for carotid revascularization, the attempt to identify which Duplex criteria are mostly employed should be appreciated and the use of a questionnaire is a valuable tool.

The paper of Walker and Naylor confirms the value that Audits and, to a larger extent, well conducted Registries may have in providing useful information. The most important messages provided by the above paper can be summarized as follows:

(1) Despite several papers published shortly after the NASCET and ECST results questioned the safety of performing CEA without diagnostic angiography,\(^2\) other studies, including the survey of Walker and Naylor,\(^1\) have shown that the use of ultrasound as the sole imaging techniques to establish the indication for CEA has worldwide replaced the utilization of other more expensive and risky technologies without detriment for patients outcome. This practice, in the attempt to decrease invasiveness and complications of carotid revascularization, has occurred in face of lack of evidence-based data supporting this switching of technologies. The issue may be even more important in the perspective of comparing CEA with carotid stenting (CAS), if and when, after the necessary randomized trials, CAS will be confirmed as an alternative or even substitute for CEA.

(2) Although the majority of respondents to Walker and Naylor questionnaire did not know or wrongly knew what measurements methods they were using, it was clear that they were indeed adopting PSV and EDV criteria validated by the North American Consensus (i.e. NASCET criteria).\(^1\)

Of course, we should be aware of the limitations of the information provided by the two authors: the number of respondents was only 102 and we have no information about the nonrespondents. On this regards it should be remembered that although Audits and Registries are important tools in depicting the ‘real world’, these have important shortcomings due to the voluntary process of registration, putting at risk the completeness of data and the rate of follow-up overdues.

Secondly, information on if and how the used methodology of the respondents reflects on the clinical practice and particularly on surgical outcomes of each individual center participating to the survey is not provided, because this was out of the aim of the study.\(^1\)

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Furthermore, because there is large evidence about the degree of carotid stenosis above which surgery is beneficial (50% by NASCET or 70% by ECST criteria for symptomatic stenosis, and 60% by ACAS criteria for asymptomatic stenosis), an exact definition may not be of crucial importance. When we reach the degree for surgical benefit based on NASCET PSV/EDV or on PSV/EDV of ECST or ACAS corresponding Duplex criteria, the exact quantification of decile may be a secondary tool: the very low complications rate after CEA reported by most recent studies (<1%) may balance the less benefit obtained in patients within lower range of stenosis. Actually, analysis of pooled data from ECST, NASCET and VA309 by Rothwell et al., based on re-measuring and re-assessing carotid angiogram with the same measurements and definitions, showed similar results, removing the uncertainty that was generated by the disparities between the originally reported results of the trials. These findings suggest that definition of exact degree of stenosis may only be a surrogate marker for outcomes.

The same can be applied for stenosis measured with Duplex scan. On the other hand, the lack of Duplex standardization of the exact degree of stenosis may carry the risk of over utilization of carotid treatment, especially in case of asymptomatic stenosis in an era of rapidly growing CAS.

In conclusion, more recent innovations in Duplex and ultrasound imaging techniques and the improving technology have led to a better understanding, careful and simplified diagnostic procedures. So that, the leading role of Duplex ultrasound in preoperative and postoperative evaluation of carotid stenosis appears strongly justified and needs validation in the individual centre even if there is no universal consensus.

References

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