ARE THE CURRENT TOOLS SUFFICIENT TO IDENTIFY THE VULNERABLE PLAQUE? NO

A Halliday
University of Oxford, UK
alisonhalliday@aol.com

It has been suggested that plaque in the carotid artery can be considered 'vulnerable' because it is soft. Terms used to describe carotid plaque such as 'friable' and 'vulnerable' are misleading as they suggest that the plaque has either already embolised or developed ulceration, or that is very likely to do so in the near future. By describing carotid plaque in this way, patients are likely to believe that operation is necessary to remove a dangerous risk of stroke, or that intervention is urgent, with plaque 'stabilisation' drugs such as statins, or even sometimes with carotid artery stenting.

Currently carotid artery plaque is usually imaged with ultrasound, CT angiography or MR imaging – the latter having led to coining of the emotive term 'lightbulb sign' when a plaque seems to have undergone recent change associated with carotid territory symptoms.

Previous research suggested that changes in symptomatic plaques removed at operation were associated with recent stroke and that, if only these changes could be detected before symptoms developed and the plaque removed, future strokes could be prevented.

Ultrasound detection of soft plaque is now quite accurate (~90% sensitivity and specificity, especially when combined with MR or CT evaluation). However, they cannot predict future behaviour, especially as most patients are now taking statins, which decrease future stroke risk by about a third. Small (and subjective) studies using 'Gray-scale median' where an operator sets the spectrum of the plaque density and then scores the plaque, can be repeated after statin treatment at a later date, but cannot accurately predict future stroke risk.

Emboli are sometimes released from the plaque. By using Trans-cranial Doppler monitoring of the middle cerebral artery, it has been suggested that future risk of stroke from the stenotic plaque can be predicted. This is unlikely to be reliable since only 1 or sometimes 2 emboli are detected at a yearly 1-hour session, and plaques are known to change within days and weeks.

A tool to detect the vulnerable plaque has not yet been found. If one can be developed, it will need to detect changes which are obvious enough to be imaged, and yet which will occur in individual patients who are not being subjected to permanent (intolerable and unaffordable), non-invasive monitoring.