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Measurement of motion of carotid bifurcation plaques

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Atherosclerotic carotid bifurcation plaque rupture is a major cause of ischemic stroke. It is recognized that this is due to the occlusion of blood vessels by detached fragments of plaque or fragments of a thrombus that has formed on the ulcerated plaque. However, while much is known about the pathology of atherosclerotic plaques, the cause of plaque rupture is not entirely understood. It has been proposed that mechanical forces contribute to the phenomenon of plaque rupture or ulceration. These forces are produced by blood pressure oscillations, blood flow and blood vessel movement throughout the cardiac cycle. It has been suggested that asymptomatic plaques, which do not rupture, have all of their components moving in the same direction as they are influenced by mechanical forces. Conversely, plaques that tend to rupture display uncoordinated movement throughout the cardiac cycle. Therefore, discordant motion may be a determinant factor in symptomatology – a matter that this ongoing research aims to elucidate and a factor that may be able to predict risk. Using a motion analysis software that evaluates standard ultrasound imaging, ultimately, this research will allow for a non-invasive, easily-accessible, cost-effective method of assessing the utility and risk of intervention such as carotid endarterectomy.

Ultrasound video loops of carotid bifurcation plaques were obtained from patients with carotid bifurcation atherosclerosis, and were classified as symptomatic or asymptomatic. Using the software, we were able to differentiate between concordant and discordant plaques; and, therefore, are one step closer to an effective, efficient diagnostic tool.

Biography

Perry Fisher is a fourth year student at Albany Medical College. He completed basic science training at the Sophie Davis School of Biomedical Education - an accelerated, seven-year medical program. Perry has received such honors as the Leonidas Lantzounis Research Grant of the Hellenic Medical Association of New York, the Stavros Hartofilis Scholarship, a Mack Lipkin Broader Horizons Research Fellowship, the Stuyvesant CCNY Scholarship, and the Peter Vallone Scholarship.

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