Magnetic Resonance Imaging of Small Vessel Disease

A Brief Summary

Radiologic reports of brain MRI studies are often notable for findings suggestive of chronic small vessel ischemic changes. In clinical practice, these findings are often ignored despite increasing evidence that small vessel ischemic changes noted on MRI play an increasing complex role in both acute and chronic brain injury. These seemingly innocuous imaging findings indicate an increased likelihood of stroke, larger strokes when they do occur, and provide a direct link to dementia, disability, and even death. The astute clinician will learn to recognize these small vessel ischemic changes as indicative of a pending avalanche of brain injury. This lecture will review the main neuroimaging findings consistent with small vessel ischemic change in both the acute and chronic settings, highlight the often progressive nature of these lesions, and discuss the essential role that MRI plays in the current and future diagnosis and monitoring of this condition. In addition, commonly used MRI sequences utilized to detect small vessel ischemic lesions will be discussed.

Designed for the neuroimager with little background in small vessel disease and its relationship to vascular neurology, this lecture will highlight current staging approaches for small vessel ischemic disease. We will review the various neuroimaging manifestations of small vessel ischemic disease in the brain and how these manifestations tie into broad categories of neurologic disease. In addition, the broad differential diagnosis that should be considered in the presence of these findings will be discussed. This lecture will also provide insight into future MRI-based techniques that are likely to be used clinically in the near future which can enhance the understanding of this disorder. Suggestions for monitoring small vessel disease progression will also be reviewed. The scope of this presentation is to bolster a practitioner’s knowledge in this area so they can provide professional interpretations of small vessel disease detected on MRI.

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