Patterns of sensory abnormality in cortical stroke

Lesions producing predominant primitive sensory impairment (number indicates Patient Number).

Studying 24 patients with cortical stroke with prominent sensory symptoms, Kim et al. found that insular or opercular area involvement is related to primitive sensory impairment and development of poststroke pain while postcentral gyrus lesions produce cortical sensory deficits or restricted sensory symptoms without poststroke pain.

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Subspecialization within somatosensory cortex

Commentary by Krish Sathian, MD, PhD

According to traditional teaching, lesions of the somatosensory cortex produce high-level deficits affecting stimulus localization, two-point discrimination, graphesthesia, and stereognosis—so-called cortical sensory deficits—whereas more basic problems in perceiving touch or pain arise from thalamic lesions. The advent of modern neuroimaging showed that this principle was often invalid. Jong S. Kim makes a substantial contribution to the clinical literature on somatosensory dysfunction following cortical lesions, based on careful clinical observations correlated with neuroimaging.¹ The main finding of this new report is that lesions of the postcentral gyrus caused predominant deficits in joint position and cortical, i.e., discriminative tactile perception, whereas more ventral lesions involving the parietal

operculum and insula resulted chiefly in thermo-nociceptive deficits and poststroke pain. Small postcentral lesions caused only paresthesias. The dichotomy between postcentral and opercular-insular lesions was not perfect, but the dominant or longest-lasting deficits correlated well with lesion location in the 24 patients studied. However, the new observations are difficult to reconcile with a previous proposal that ventral somatosensory cortical lesions cause long-lasting tactile agnosia while more dorsal lesions produce only transient sensorimotor problems².

The idea of functional specialization within human somatosensory cortex is not new. The postcentral gyrus contains multiple somatosensory maps corresponding to Brodmann's areas 3a, 3b, 1, and 2, and there are also multiple somatosensory

maps in the parietal operculum and insula. In addition, somatosensory processing occurs in parts of posterior parietal cortex. There has been intense debate about the functional specificity of these various somatosensory regions, and the sequences of parallel and hierarchical processing in these areas remain to be fully elucidated. The challenge for the future is to synthesize the seemingly disparate findings in the basic and clinical literatures to arrive at a fuller understanding of somatosensory cortical networks.

References

1. Kim JS. Patterns of sensory abnormality in cortical stroke: evidence for a dichotomized sensory system. *Neurology* 2007;68:174–180.
2. Caselli RJ. Ventrolateral and dorsomedial somatosensory association cortex damage produces distinct somesthetic syndromes in humans. *Neurology* 1993;43:762–771.

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