Focal Lesion in the Intraparietal Sulcus: A Case for Network-Dependent Release Hallucinations. [1].

Focal brain lesions can alter the morphology and function of remote brain areas. When the damage is inflicted more slowly, the functional compensation by and structural reshaping of these areas seem to be more effective. It remains unclear, however, whether the momentum of lesion development also modulates the functional network topology of the remote brain areas. In this study, we compared resting-state functional connectivity data of patients with a slowly growing low-grade glioma (LGG) with that of patients with a faster-growing high-grade glioma (HGG). Using graph theory, we examined whether the tumour growth velocity modulated the functional network topology of remote areas, more specifically of the hemisphere contralateral to the lesion. We observed that the contralesional network topology characteristics differed between patient groups. Based only on the connectivity of the hemisphere contralateral to the lesion, patients could be classified in the correct tumour-grade group with 70% accuracy. Additionally, LGG patients showed smaller contralesional intramodular connectivity, smaller contralesional ratio between intra- and intermodular connectivity, and larger contralesional intermodular connectivity than HGG patients. These results suggest that, in the hemisphere contralateral to the lesion, there is a lower capacity for local, specialized information processing coupled to a higher capacity for distributed information processing in LGG patients. These results underline the utility of a network perspective in evaluating effects of focal brain injury [2].

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2)
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