Unilateral hearing loss

Long-term unilateral hearing loss could reorganize the functional network association between the bilateral auditory cortices, while alterations of other functional networks need to be further explored. Wei et al. attempted to investigate the pattern of the reorganization of functional network associations between the auditory cortex and visual cortex caused by long-term postlingual unilateral hearing loss (UHI) and its relationship with clinical characteristics. Therefore, 48 patients with hearing loss caused by unilateral acoustic tumors and 52 matched healthy controls were enrolled, and their high-resolution structural MRI and resting-state functional MRI data were also collected to depict the brain network. Degree centrality (DC) was employed to evaluate the functional network association of the auditory-visual network interaction. Group comparisons were performed to investigate the network reorganization, and its correlations with clinical data were calculated. Compared with the healthy control group, patients with UHI showed significantly increased DC between the auditory network (superior temporal gyrus and the medial geniculate body) and the visual network. Meanwhile, this difference was positively correlated with the extent of hearing impairment, and the correlation was more significant with the ipsilateral superior temporal gyrus in cases of acoustic neuroma. These results suggest that long-term unilateral hearing impairment may lead to enhancement of the visual-auditory network interactions and that the degree of reorganization is positively correlated with the pure tone average (PTA) and is more significant for the ipsilateral superior temporal gyrus, which provides clinical evidence regarding cross-modal plasticity in the UHI and its lateralization [1].

1)
Wei Z, Fan Z, Qi Z, Tong Y, Guo Q, Chen L. Reorganization of auditory-visual network interactions in long-term unilateral postlingual hearing loss. J Clin Neurosci. 2021 May;87:97-102. doi: 10.1016/j.jocn.2021.02.017. Epub 2021 Mar 19. PMID: 33863544.