1. Record Nr. UNINA9910136798903321

Autore	Rudiger J. Seitz
Titolo	Principles Underlying Post-Stroke Recovery of Upper Extremity Sensorimotor Function - A Neuroimaging Perspective
Pubbl/distr/stampa	Frontiers Media SA, 2016
Descrizione fisica	1 online resource (153 p.)
Collana	Frontiers Research Topics
Soggetti	Neurology and clinical neurophysiology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

Sommario/riassunto

Neuroimaging post-stroke has the potential to uncover underlying principles of disturbed hand function and recovery characterizing defined patient groups, including their long term course as well as individual variations. The methods comprise functional magnetic resonance imaging (MRI) measuring task related activation as well as resting state. Functional MRI may be complemented by arterial spin labeling (ASL) MRI to investigate slowly varying blood flow and associated changes in brain function. For structural MRI robust and accurate computational anatomical methods like voxel-based morphometry and surface based techniques are available. The investigation of the connectivity among brain regions and disruption after stroke is facilitated by diffusion tensor imaging (DTI). Intra- and interhemispheric coherence may be studied by electromagnetic techniques such as electroencephalography and transcranial magnetic stimulation. Consecutive phases of stroke recovery (acute, subacute, early chronic and late chronic stages) are each distinguished by intrinsic processes. The site and size of lesions entail partially different functional implications. New strategies to establish functional specificity of a lesion site include calculating contrast images between patients exhibiting a specific disorder and control subjects without the disorder. Large-size lesions often imply poor cerebral blood flow which impedes recovery significantly and possibly interferes with BOLD response of functional MRI. Thus, depending on the site and size of the

infarct lesion the patterns of recovery will vary. These include recovery sensu stricto in the perilesional area, intrinsic compensatory mechanisms using alternative cortical and subcortical pathways, or behavioral compensatory strategies e.g. by using the non-affected limb. In this context, behavioral and neuroimaging measures should be developed and employed to delineate aspects of learning during recovery. Of special interest in recovery of hand paresis is the interplay between sensory and motor areas in the posterior parietal cortex involved during reaching and fine motor skills as well as the interaction with the contralesional hemisphere. The dominant disability should be characterized, from the level of elementary to hierarchically higher processes such as neglect, apraxia and motor planning. In summary, this Research Topic covers new trends in state of the art neuroimaging of stroke during recovery from upper limb paresis. Integration of behavioral and neuroimaging findings in probabilistic brain atlases will further advance knowledge about stroke recovery.