뇌신경재활

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

P 2-109

Corticostriatal tracts between the striatum and the premotor area in the human brain: A DTT study

Jeong Pyo Seo[1†], Sung Ho Jang[1†], Jun Young Kim[1*†]

College of Medicine, Yeungnam University, Department of Physical Medicine and Rehabilitation [1]

Interaction between the striatum, the supplementary motor area (SMA), and the premotor cortex (PMC) is involved in the performance of movement sequences and skilled movements. Although a few studies have described the neural connectivity of the bilateral corticostriatal (CStr) tracts by using diffusion tensor imaging (DTI), no previous CStr tract study has fully reconstructed their structure in the live human brain. In the current study, by using diffusion tensor tractography (DTT), we reconstructed the CStr tracts and observed the characteristics of those CStr tracts in normal subjects. Forty-two healthy subjects were enrolled in this study. The CStr tracts, one from the dorsal premotor cortex (dPMC) and the other from the SMA, descend to the striatum of the basal ganglia. Their structures were reconstructed by using DTI data. Fractional anisotropy, mean diffusivity, and tract volume of the CStr tracts were measured. In all subjects, CStr tracts, which originate from the dPMC and the SMA, were shown to descend through the corona radiata and terminate at the striatum. No significant differences in DTT parameters of the CStr tracts originating from the dPMC and the SMA were observed between the left and right hemispheres ($p > 0.05$). We reconstructed the CStr tracts from the dPMC and the SMA in the human brain by using DTT. We believe that the results and the proposed reconstruction method used in this study will be useful in future research into the CStr tracts in the human brain.

Acknowledgment :This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF-2016R1A6A3A11933121)

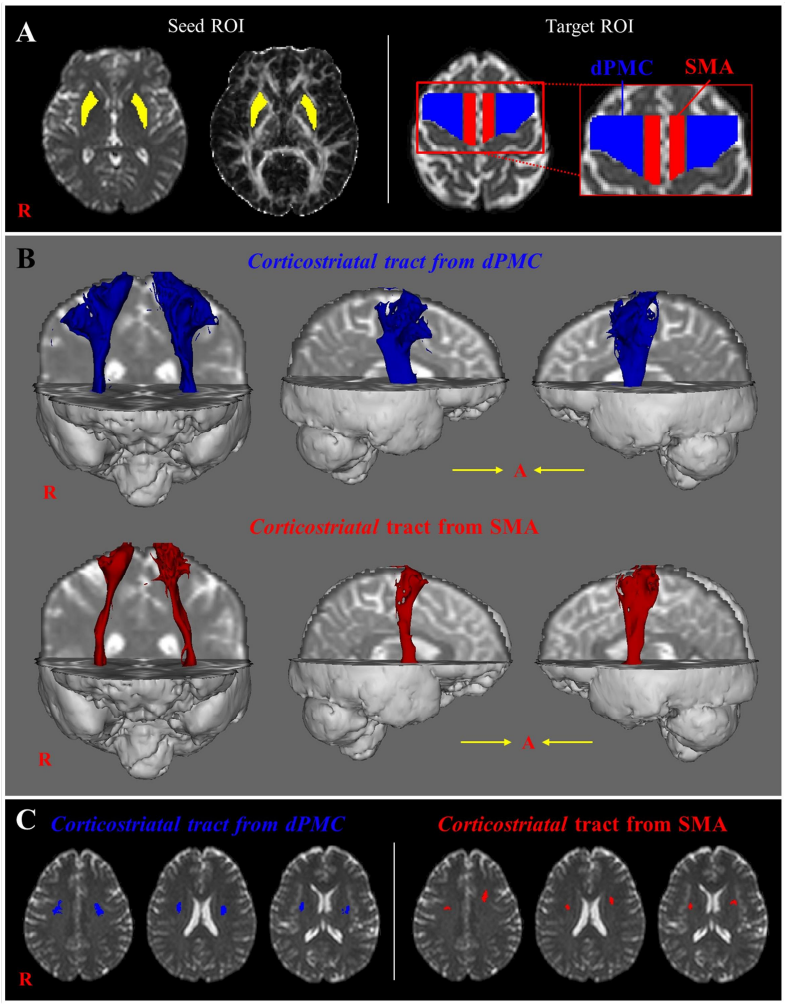

Figure1. The regions of interest (ROIs) and results of diffusion tensor tractography for the bilateral corticostriatal (CStr) tracts from dorsal premotor cortex (dPMC) and the supplementary motor area (SMA) (A) The seed and target ROIs are placed on the striatum of the basal ganglia (yellow), and the dPMC (blue) and SMA (red), respectively. (B) The CStr tracts from the dPMC and SMA are reconstructed in both hemispheres of the brain of a normal subject (35-year-old male). (C) The pathway of the CStr tracts is shown at three levels of the brain of a normal subject (35-year-old male).