Supplementary Information

Methods

Motor Evoked Potentials (MEPs)

Stimulation involved train-of-five pulses at a 2-ms stimulation interval between two electrodes, with one functioning as an anode and the other as a cathode. Myoelectric signals were amplified using a 0.3–3-kHz bandpass filter and displayed on a monitor (Neuromaster; MEE-2032G1, Nihon Kohden). MEP amplitude was defined as the range between the maximum positive and negative peaks of the multiphasic compound muscle action potentials (CMAPs). MEPs were elicited from the adductor pollicis brevis (APB), tibialis anterior (TA), gastrocnemius (Gc), and abductor hallucis longus (AH) muscles. Four muscle groups were used for transcranial electrical stimulation (TES), whereas two muscle groups (APB, AH) contralateral to anodal stimulation were utilized for direct cortical stimulation (DCS).

Tetanic Stimulation Before TES/DCS

In mt-MEP, the median nerve at the contralateral wrist and the tibial nerve at the ankle were stimulated simultaneously 1 s before TES/DCS to elicit MEPs (50 Hz; stimulation intensity, 50 mA for the median nerve, 30–40 mA for tibial nerve; duration, 5 s). For p-MEPs, surface electrodes arranged for bulbocavernosus reflex monitoring were used, with an anode in the distal penis and a cathode in the proximal penis. Tetanic stimulation was applied to the pudendal nerve in the penis 1 s before TES/DCS (50 Hz; stimulation intensity, 20–40 mA; duration, 5 s). TES/DCS were automatically triggered following tetanic stimulation and performed in a manner similar to c-MEP measurements, with CMAPs recorded from the same muscles used for c-MEP recordings.

Statistical Analyses

All MEP waveforms valid for mt-MEPs and p-MEPs in each muscle group were extracted, and changes in amplitude were examined pre- and post-hemispherotomy for each muscle group. The Mann–Whitney U test was employed for each comparison. Statistical analyses were performed using EZR version 1.55 software (Saitama Medical Centre, Jichi Medical University), a graphical user interface for R (R Foundation for Statistical Computing) [1]. The significance level was set at p-values of < 0.05.

References

1. Kanda Y (2013) Investigation of the freely available easy-to-use software 'EZR' for medical statistics. Bone Marrow Transplant 48:452–458. https://doi.org/10.1038/bmt.2012.244