Gradient magnetic field topography

Gradient magnetic field topography (GMFT) with magnetoencephalography (MEG) has been developed to demonstrate magnetic-field gradients of epileptic spikes on a volume-rendered brain surface. We evaluated GMFT in patients with anterior 2/3 corpus callosotomy (ACC) for drop-attacks. METHODS: Eight patients (age; 11-37 years) underwent ACC. GMFT evaluated the predominant distributions (anterior/posterior) and the spreading patterns (unilateral/bilateral) of pre- and postoperative interictal MEG spikes corresponding to generalized spikes on EEG. We compared the occurrence of four types of spikes; anterior unilateral spike (AUS), posterior unilateral spike (PUS), anterior bilateral spike (ABS), posterior bilateral spike (PBS) between 5 patients (group G) with good control of drop attacks and 3 patients (group P) with residual drop attacks. RESULTS: Preoperatively, GMFT showed the proportion of ABS in group G (mean ± SD, 57.4 ± 9.7%) was significantly ($p=0.024$) higher than that in group P (31.6 ± 15.2%). The number and proportion of postoperative ABS and PBS in group G were significantly decreased ($p<0.05$ in all). CONCLUSION: GMFT is valuable to evaluate pre- and post-operative predominant spikes in patients with drop attacks. SIGNIFICANCE: GMFT revealed a higher proportion of preoperative ABS and postoperative decline of both ABS and PBS in patients with good control of drop attacks after ACC [1)].

1)
Kagawa K, Iida K, Hashizume A, Katagiri M, Baba S, Kurisu K, Otsubo H. Magnetoencephalography using gradient magnetic field topography (GMFT) can predict successful anterior corpus callosotomy in patients with drop attacks. Clin Neurophysiol. 2016 Jan;127(1):221-9. doi: 10.1016/j.clinph.2015.04.292. Epub 2015 Jun 27. PubMed PMID: 26187350.