PO57. SAFETY AND EFFICACY OF PREOPERATIVE CORTICAL MAPPING USING A NAVIGATED TRANSCRANIAL MAGNETIC STIMULATION (NTMS) TECHNOLOGY IN PATIENTS HARBORING BRAIN TUMOURS IN ELOQUENT AREAS

J. Ekanayake and G. Samandouras; National Hospital for Neurology and Neurosurgery, Queen Square, London

INTRODUCTION: Maximum safe resection of tumours located in eloquent areas is hampered by risk of motor, language and visual deficits. NTMS is a rapidly emerging, non-invasive brain stimulation technique generating pre-operative cortical function maps critical for surgical guidance around eloquent cortex. We report our early experience on efficacy, safety and physiological intraoperative correlation.

METHOD: Six patients underwent cortical mapping (1 language, 3 motor) using Nexstim Navigated Brain Stimulation (NBS). Single TMS pulses delivered at intensities evoking responses in abductor pollicis brevis. Patients were co-registered to volumetric T1 or T2-weighted MRI. Surgical corridors and anatomically determined functional regions were identified by applying TMS in a topographically systematic manner. Presence/absence of responses were noted in target muscles (arm/leg). For language mapping, without TMS, baseline responses to line drawings were recorded via built-in video. Five-pulse trains of TMS were applied to language areas. Speech arrest and response errors were compared to baseline. During awake surgery, functional ‘on/off’ maps were utilised with intraoperative imaging, fMRI, diffusion tensor imaging, and direct cortical stimulation (DCS). RESULTS: The were no technique-related adverse effects. Patients tolerated the technique well. Comparison of TMS and bipolar DCS maps confirmed a high degree of overlap (≤2 mm).

CONCLUSION: NBS-TMS is safe and can be used to accurately identify pre-operatively eloquent cortical function, and is comparable to DCS; it may be useful for functional mapping in patients not suitable for awake surgery. More data is required to validate this technique in a larger cohort of patients.