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Mapping of Broca's area in awake surgery using preoperative magnetic and intraoperative electric stimulation


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Navigated transcranial magnetic stimulation (nTMS) is used for eliciting corticobulbar motor evoked potentials (CoMEP) in cricothyroid muscle, where long latency response (LLR) represents Broca's area function. Equally, brain mapping of motor speech areas in awake surgery uses direct cortical electrical stimulation (DCS) with short train of stimuli (STS) technique, and causes speech arrest with LLRs recording. Whether both methods can be combined in awake surgery remains unclear. We will describe our experience in glioma awake surgery with preoperative nTMS and intraoperative STS DCS brain mapping. Patients were presented with expressive dysphasia, epileptic seizures, and/or prolonged periods of impaired consciousness. Positive magnetic resonance imaging (MRI) confirmed tumor in left frontal region in all patients. Preoperative nTMS brain mapping was visualized through 3D neuronavigation system. During the awake surgery nTMS cortical spots were confirmed by DCS, and caused speech arrest with LLR. Suction mapping device for subcortical brain mapping was used during tumor extirpations. The postoperative course was uneventful. Patients had preserved receptive language functions, sometimes with slight temporary difficulties in speech fluency. The preoperative nTMS was useful in planning and facilitating the DCS mapping of motor speech areas during awake brain surgery. More cases are needed to report further on the double mapping method.

Speaker Biography

Zmajevic Schonwald M has completed her PhD from Zagreb University, Croatia. She is neurologist and neurophysiologist specialized in intraoperative neurophysiology, and the scientific associate at Medical School Zagreb University, Croatia. She works as the Head of the Intraoperative neurophysiology unit at Neurosurgery Clinic, Medical Center "Sisters of Mercy", Zagreb, Croatia, and has over 20 publications connected with neurophysiology, intraoperative neurophysiology that mostly have been included in Current Contents database. She has been serving as intraoperative neurologist/neurophysiologist of the first awake neurosurgery team in Croatia.

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