

Article Highlight

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Article: Intraoperative Motor Evoked Potential Alteration in Intracranial Tumor Surgery and Its Relation to Signal Alteration in Postoperative Magnetic Resonance Imaging

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Summary: This paper is a prospective sampling of data over a 6 year period at an academic center in Frankfurt, Germany of patients undergoing intracranial tumor surgery with intraoperative monitoring, who had alteration of transcranial electrical stimulated motor evoked potentials (MEPs) during the procedure. Various criteria were used to narrow the sample to 29 patients who fit the inclusion criteria from a sample of 965 patients. Changes were classified as either Deterioration or Loss with each having a subcategory of Reversible or Irreversible. The changes needed to be present in 3 consecutive recordings. Deterioration was classified as a 50% amplitude decrement or latency shift of 2ms. Postoperative clinical outcomes were recorded as well as a comparison of pre and postoperative MRI scans. The data was analyzed with Fisher's exact test appropriate for the small sample size and results showed statistically significant p values.

The author's conclusions were that irreversible intraoperative MEP alterations (either loss or deterioration) was associated with new motor deficits significantly more frequently than those with reversible MEP alterations. MEP loss is associated with greater risk of developing new motor deficits than MEP deterioration. MEP loss is caused by lesions to the corticospinal tract during surgery based on postoperative MRI findings. MEP deterioration on the other hand is more likely caused by lesions to the motor cortex based on postoperative MRI findings.

Comments: This paper gives a good reference for performing TCMEP testing in intracranial tumor resections. The technical criteria can be modified according to the equipment and protocols established for any given institution, but the decision tree analysis outlined in the Methods section is a good algorithm to follow when approaching any changes observed during monitoring. I feel the correlation with MRI changes is a good idea in principal and I feel this is the way that intraoperative monitoring in general can progress with more rigorous analysis and the use of combinations of inraop modalities with other tests to give the patient better prognostic indicators for clinical outcome. Overall a very good paper for the intraoperative professional to have on standby to share with the surgeon and anesthesiologist in determining the value of TCMEPs during intracranial tumor surgery.