

FEASIBILITY OF CONTINUOUS MONITORING OF CORTICO-SPINAL TRACTS DURING FOCUS RESECTION FOR DRUG-RESISTANT NON-TUMORAL FRONTAL EPILEPSY

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Surgical resections in frontal areas carry a risk of damaging the cortico-spinal tract. The possibility to define the central sulcus is of great help in the identification of the motor cortex, but injuries to the motor pathways may occur subcortically; therefore, continuous monitoring of motor evoked responses is advisable. The Penfield bipolar 50-60Hz technique is used to map the motor cortex, but it has a 20% rate of intraoperative seizures and, most important, it does not allow the continuous monitoring of motor pathways. We describe our experience in 3 cases of frontal epilepsy submitted to the resection of the epileptic focus with the assistance of intraoperative neurophysiological monitoring in order to demonstrate the feasibility and safety of intraoperative continuous monitoring of corticospinal pathways under general anaesthesia in epileptic patients.

A total intravenous anaesthesia with infusion of Propofol and Remifentanyl was used, avoiding muscle relaxant after intubation. The central sulcus was identified using the somatosensory phase reversal technique (stimulation of the contralateral median nerve and recording directly from the cortex through a strip multicontact electrode placed perpendicular to the expected central sulcus) The motor cortex was mapped and the corticospinal tracts continuously monitored. Motor potentials were evoked using short trains of 3-5 stimuli, 0.5ms, ISI 4ms, up to 20mA. The motor responses were recorded from muscles of the upper and lower extremities.

In all the cases, central sulcus identification was possible through the N20-P20 phase reversal. Continuous motor monitoring was performed in all the patients; no change in muscle responses was detected throughout the operation. No motor deficit was present post-operatively. No complications were observed, particularly intra or postoperative seizures. The 3 patients are seizure free at a mean follow up of 2 years.

Our data confirm the importance of motor mapping and cortico-spinal pathways continuous monitoring. Our technique is feasible under general anaesthesia, is reliable and safe in epileptic patients.