

-For Further Research Info: **703-280-2101**
-Website: **www.sentientmedical.com**



Intraoperative Monitoring and Diagnostic Services

IOM Improves Outcome During Spinal Cord Tumor Resection

The following article presents a cogent description of the need of intraoperative neurophysiological monitoring during spinal intramedullary surgery. The careful use of multimodality monitoring guides the surgeon during these difficult surgeries.

Sala F, Bricolo A, Faccioli F, Lanteri P and Gerosa M. **Surgery for intramedullary spinal tumors: the role of Intraoperative (neurophysiological) monitoring.** Eur Spine J. 2007; 16(supp 2): S130-139.

In spite of advancements in neuro-imaging and microsurgical techniques, surgery for intramedullary spinal cord tumors (ISCT) remains a challenging task. The rationale for using intraoperative neurophysiological monitoring (IOM) is in keeping with the goal of maximizing tumor resection and minimizing neurological morbidity. For many years, before the advent of motor evoked potentials (MEPs), only somatosensory evoked potentials (SEPs) were monitored. However, SEPs are not aimed to reflect the functional integrity of motor pathways and, nowadays, the combined use of SEPs and MEPs in ISCT surgery is almost mandatory because of the possibility to selectively injure either the somatosensory or the motor pathways. This paper is aimed to review our perspective in the field of IOM during ISCT surgery and to discuss it in the light of other intraoperative neurophysiologic strategies that have recently appeared in the literature with regards to ISCT surgery. Besides standard cortical SEP monitoring after peripheral stimulation, both muscle (mMEPs) and epidural MEPs (D-wave) are monitored after transcranial electrical stimulation (TES). Given the dorsal approach to the spinal cord, SEPs must be monitored continuously during the incision of the dorsal midline. When the surgeon starts to work on the cleavage plane between tumor and spinal cord, attention must be paid to MEPs. During the tumor removal, we alternatively monitor D-wave and mMEPs, sustaining the stimulation during the most critical steps of the procedure. D-waves, obtained through a single pulse TES technique, allow a semi-quantitative assessment of the functional integrity of the cortico-spinal tracts and represent the strongest predictor of motor outcome. Whenever evoked potentials deteriorate, temporarily stop surgery, warm saline irrigation and improved blood perfusion have proved useful for promoting recovery. Most of intraoperative neurophysiological derangements are reversible and therefore IOM is able to prevent more than merely predict neurological injury. In our opinion combining mMEPs and D-wave monitoring, when available, is the gold standard for ISCT surgery because it supports a more aggressive surgery in the attempt to achieve a complete tumor removal. If quantitative (threshold or waveform dependent) mMEPs criteria only are used to stop surgery, this likely impacts unfavorably on the rate of tumor removal.

Sentient Research Committee:

Stephen Oppenheimer, MD, PhD, FRCP, FACP, FRCPC, FAHA
CMO and Director of Research

Robert Cox, MS, PhD, CNIM
Director, Sentient Education Institute

Alexander Razumovsky, PhD, FAHA
Director, NeuroCare Services

To Schedule a Case :

888-481-9185, x0