

# Intraoperative Neurophysiology of the Spinal Cord Injured Patients

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The neuroimaging technique did not contribute significantly to the prognosis of the patients with SCI, while neurophysiologic testing still has not been done on the routine basis in order to make neurophysiologic profile of SCI patients. Furthermore, even not many neurophysiologic data has been published in acute SCI patients. There are many reason for that: (a) one of pragmatic reason is that intraoperative neurophysiologic team is not always available to perform testing, during spine stabilization in most cases occurred in non regular working hours, and (b) surgical team is not get used to work with neurophysiologic team in this category of patients.

On the basis of preliminary testing supported by “Science Program of Foundation for movement recovery”, Stiftelsen foundation, Oslo Norway, we will show a very promising results in creating neurophysiologic profile of SCI patients (see Costa P. et al., and Sala F., et al.) this issue. This preliminary data was collected on the basis of our work on the intraoperative neurophysiology (ION) of the spinal cord.

In the field ION reliable methods to predict functional integrity of the long tracts during surgical intervention to the spinal cord, has been already developed and established. This is very much true for the (a) motor evoked potentials (MEPs) recorded from the spinal cord in the form of D and I waves and (b) MEPs recorded from the limb muscle.

The first method can semi quantitatively estimate number of the fast neurons of the corticospinal tract (CT), while other method give evidence of the integrity of the fast neurons plus supportive system of the spinal cord (1). The both system are essential for generating muscle MEPs.

Complete disappearance of the D wave during intramedullary surgery correspond with severe and definitive plegia, while disappearance of muscle MEPs, with preservation more than 50% of baseline amplitude of the D wave results in a transient plegia (2,3). Therefore we consider presence of the D wave as a reliable prognostic sign for the motor recovery, because it can semi quantify number of the fast neurons of the CT, as one of the essential element for voluntary movement;

The same rule we can apply, for the acute SCI patients. Therefore only patients having the D wave recovered after SCI, even not having initially presence of the muscle MEPs.

These data created neurophysiologic profile of the SCI patients concerning conduction system of the spinal cord, as a background for the further expansion of neurophysiologic testing to the gray matter of the spinal cord (processing system) and further categorization, intervention, and rehabilitation strategies.

## References:

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