

Editorial

Brain Mapping

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This special edition “Brain Mapping” of *Journal of Neurological Surgery Part A* is dedicated to the newest advances in pre- and intraoperative neurophysiological mapping techniques.

Complete removal or gross total resection (GTR) remains the surgical goal for most intracranial tumors including gliomas, and there is increasing evidence that GTR prolongs overall and progression-free survival in lower grade gliomas and glioblastomas. However, the oncological advantage of a more radical resection may be counterbalanced by increasing risks of neurological deficits. Respecting postoperative quality of life becomes a major issue in planning and performing surgery. Therefore, the key concept is “maximal safe resection,” which can be guided by pre- and intraoperative neurophysiological mapping methods.

Noninvasive transcranial magnetic stimulation (TMS) testing allows for preoperative assessment and localization of eloquent areas. MRI-navigated paradigms provide an individ-

ual treatment plan for every patient, which can be established before the surgery. To adapt the surgical strategy, intraoperative subcortical mapping can be used to localize white matter tracts at different stages of tumor resection with the highest accuracy. Intermittent or even continuous subcortical stimulation provides real-time identification of functional white matter pathways.

Pre- and intraoperative mapping techniques not only help to preserve function and assess plasticity, but also indirectly increase the success rate of radical tumor resection by clarifying whether a region that is presumed preoperatively to be eloquent is confirmed intraoperatively to be eloquent. The concept of presumed eloquence as a modifiable risk factor predicting disease progression and death has been shown recently. Therefore, we strongly believe that surgery of eloquent brain tumors should be guided by brain mapping, and we hope the reader will enjoy some of the articles published in this edition.

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