Electromyographic response variations in the motor hand area of the dominant and non-dominant hemisphere: a navigated TMS study [Abstract]

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challenging due to fixed dural venous sinuses, and CSF-leakage from infratentorial wounds is more often affected by forces of gravity, than supratentorial. We sought to identify predictors associated with the development of CSF-leaks and evaluate frequency and costs related to complications at our department.

Methods

An observational study of a retrospective cohort was conducted at a single, tertiary neurosurgical center (Rigshospitalet, Copenhagen). Adult patients undergoing infratentorial tumor surgery (excl. translabyrinthine approach) between 2019-2023 were included, if the patient had histologically verified neoplasia, no previous history of infratentorial surgery, pre- and post-operative MRI existed, and were alive 30 days post-operative. Data from the patient's primary surgery was collected via patient charts, radiology databases, and patoanatomical examinations following hospital board approval. CSF-leaks were defined as leaks that needed some degree of intervention: suturing, revision surgery, or prolonged admission due to antibiotic treatment.

Results

240 patients (mean age=57.6, 149 females) were included; 125 patients with benign tumors and 103 with cerebellar metastasis. 20.0% of patients had postoperative CSF-leakage complications. Patients with CSF-leaks and wound complications were hospitalized almost three times longer post-operatively (mean=3.8vs.10.3 days, β=5.69, 95%CI [4.40,7.00], p=1.26e-15). Patient age (OR 0.97, p=0.032) and surgery by a surgeon with frequent conduct of skull-base procedures (OR 0.12, p=0.0086) were significant protective factors. Patients with malignant tumors (β=-1.94, 95%CI [-3.25,-0.62], p=0.0041) and patients where Adherus (Stryker) was used (β=1.52, 95%CI [0.14,2.89], p=0.031) had significantly longer hospitalization.

Conclusions

Our findings suggest that CSF-leaks and wound complications following posterior fossa tumor surgery led to significantly prolonged hospitalization. Perioperative identification and evaluation of factors associated with wound complications could improve care and reduce resources spent managing CSF-leaks.

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Change of white matter integrity of the Corpus Callosum and neuropsychological abilities after resection of high grade gliomas

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Oral e-Poster Presentations - Booth 1:Neuro-oncology 6 (Advanced Imaging and Monitoring of Cerebral Functions), 7 (Adjuvant, Experimental and Local Therapies), 8 (Genetics and Molecular Biology), 9 Varia, Exhibition Hall, October 8, 2025, 12:40 PM - 2:10 PM

Patients with high-grade gliomas frequently suffer from neurocognitive decline caused by damage to the connectome. The corpus callosum (CC) is the largest fiber bundle in the human brain. It qualifies to identify decline in white matter integrity (WMI) correlating with neuroginitive functioning. We hypothesize a deterioration of WMI and neuropsychological parameters (NP) after resection due to injury of fiber bundles.

Methods

16 patients with high-grade gliomas underwent MRI with DTI within one week before and within 48 hours after resection. We used the software FSL (FMRIB Software Library, Oxford) to determine fractional anisotropy (FA) in three standardized volumes of the CC. NP testing was performed within one week before and after surgery. We conducted a Spearman's correlation between FA and NP parameters. Changes in FA and NP parameters after surgery were analyzed using a paired t-test.

Results

There was deterioration of WMI in the rostrum in 7 patients, in the truncus in 10 patients and in the splenium in 7 patients. In patients with edema but no infiltration of the CC (n=7) FA declined significantly in the rostrum (p=.005). There was significant decline in visuospatial reconstruction abilities (ROCF) (p=0.0253), Trail-Making-Test (TMT) (p=0.0.0298), 9-Hole-Pegboard Test (p=0.0179) and Hopkins Verbal Learning and Memory Test (HVLT) (p=0.0.0117) after surgery. Preoperatively, FA in the rostrum correlated with the TMT and lexical fluency test, FA in the truncus correlated with HVLT, and FA in the splenium with Digit Symbol Modality Test. Postoperatively, FA in the truncus correlated with HVLT and Stroop Color Word Test, and FA in the splenium with HVLT and ROCF.

Conclusions

We observed significant deteriorations in transcallosal fiber integrity during the short-term postoperative course, which correlated with declines in visuospatial/constructive abilities, learning and memory, as well as executive functions in this small patient cohort.

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Electromyographic Response variations in the Motor Hand Area of the Dominant and Non-Dominant Hemisphere: A Navigated TMS Study

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Since 2009, navigated transcranial magnetic stimulation (nTMS) is accepted as a diagnostic and therapeutic tool in several neurosurgical applications, particularly to perform functional cortical mapping. However, its use in determining the precise cortical representation of the motor hand area affected by intracranial lesions remains limited. This study aims to asses the extent and functional impact of lateralized brain pathologies on the functional hand area.

Methods

We performed a retrospective analysis on prospectively collected data of at least 20 neurosurgical patients undergoing bilateral motor nTMS (NEXSTIM NBS5) during clinical routine. Patients were tested following an internal standard protocol after determination of the motor stimulation threshold for each hemisphere. After MRI fusion, we analyzed the size of the suprathreshold hand motor response via electromyography (EMG), minimal motor threshold according to side, and handiness as well as age and pathology.

Results

Preliminary data suggest that the dominant hemisphere exhibits a larger motor hand area surface and a lower stimulation threshold compared to the non-dominant hemisphere, even in the presence of a lesion. Additionally, lesion-related factors such as edema or hemorrhage may influence EMG responses, potentially altering the expected motor representation patterns.

Conclusions

Preliminary data suggest differences in motor representation of the hand area according to side and handiness. This study might support the importance of preoperative motor mapping for neurosurgical planning.

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Prevalence of Psychological Symptoms in Newly Diagnosed Brain Tumor Patients: A Cross-Sectional Study

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Psychological symptoms such as depression, anxiety, and personality changes are common in patients with newly diagnosed brain tumors. These symptoms can manifest before overt neurological deficits, often due to tumor-related pressure and edema. Studies show that up to 21.7% of brain tumor patients experience depression, with a higher incidence in malignant, supratentorial tumors like gliomas and meningiomas. Early identification of these symptoms can aid in timely brain tumor detection and facilitate mental health