Metastases Affecting the Motor Eloquent Cortex Should Be Resected With Preoperative Motor Mapping Fata by nTMS

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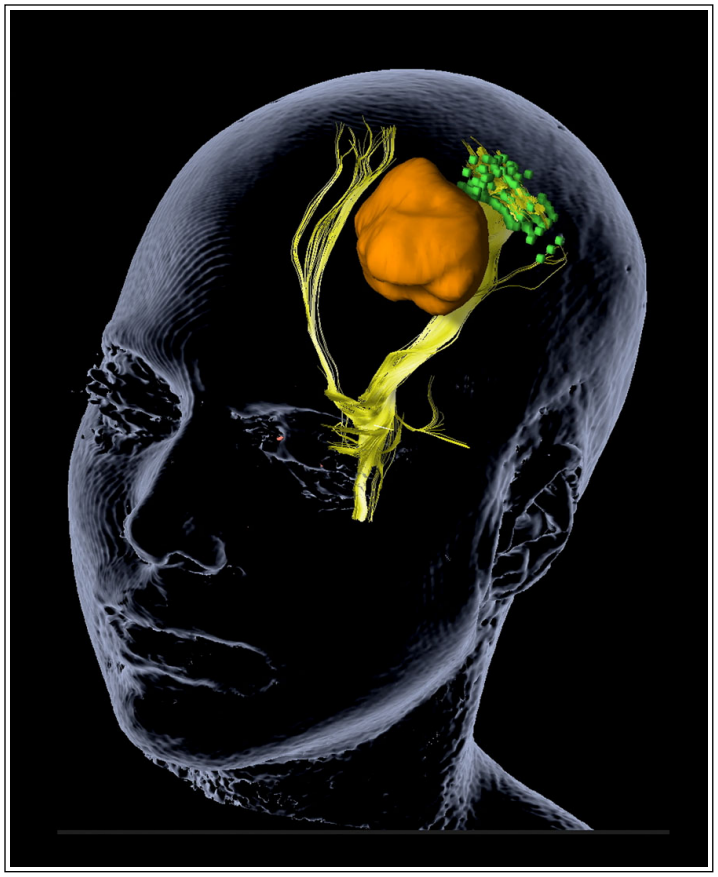
Introduction

Improvement in outcome for supratentorial lesions located in motor eloquent areas, especially gliomas, was already shown repeatedly if preoperative mapping of motor areas was performed by navigated transcranial magnetic stimulation (nTMS). Yet, data on motor eloquently located metastases is still lacking. Thus, this multicentric study aimed to compare the surgical outcome of patients with motor eloquently located supratentorial metastases investigated with or without preoperative nTMS.



Methods

Prospectively enrolled cohorts of our international study group were divided into patients undergoing preoperative nTMS (2010-2015; 120 patients) and patients who were operated on without nTMS data (2006-2015; 130 patients). Tumor location, size, and preoperative deficits were comparable.

Results

The nTMS group showed a lower rate of residual tumor on postoperative MRI (OR 0.2278; 95% CI 0.0.0925 – 0.0.5610).

On long-term follow-up, surgery-related paresis was superior in the nTMS group (nTMS vs. non-nTMS; improved: 30.8% vs. 13.3%, unchanged: 65.8% vs. 73.3%, worse: 3.3% vs. 13.3% of patients; p=0.0.0036; Figure 1).

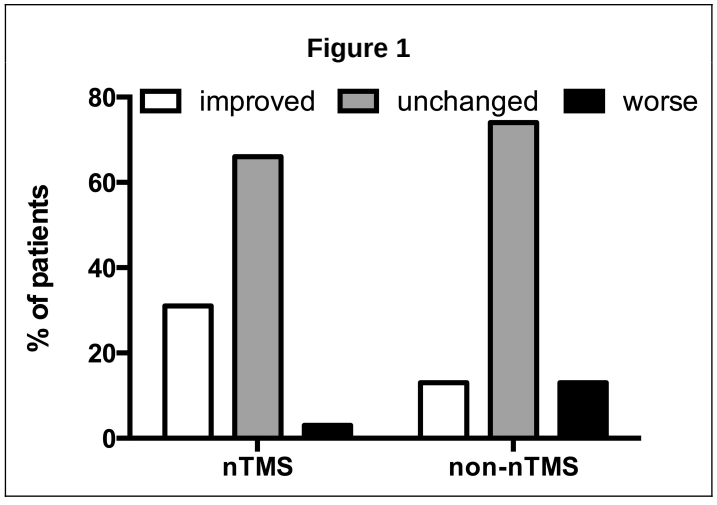


Figure 2: Surgery-related paresis in both groups.

Moreover, the nTMS group showed smaller craniotomies (nTMS: 16.7 ± 8.6 cm2 vs. non-nTMS: 20.0 ± 10.1 cm2; p=0.0.0395; Figure 2).

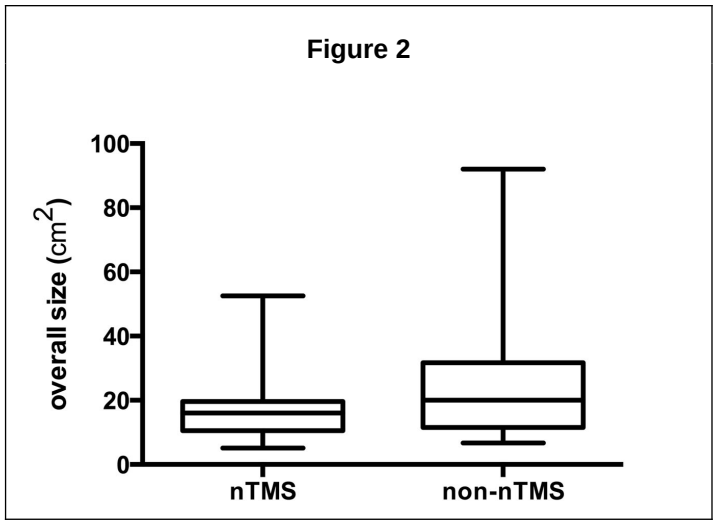


Figure 2: Size of craniotomy differed significantly (p<0.0001).

Surgical time differed significantly between both groups (nTMS: 128.8 ± 49.4 min vs. non-nTMS: 160.1 ± 71.3 min; p=0.0013).

Conclusions

This work increases the level of evidence for preoperative motor mapping by nTMS for metastases affecting the motor cortex in a group comparison study. We therefore strongly advocate nTMS to become increasingly used for these lesions. However, a randomized trial on the comparison with the gold standard of intraoperative mapping seems mandatory.

Learning Objectives

By the conclusion of this session, participants should be able to judge the worth of preoperative motor mapping for eloquent metastases