Abstract
Greater extent of resection (EOR) of low-grade gliomas is associated with improved survival. Proximity to eloquent cortical regions often limits resectability and elevates the risk of surgery-related deficits. Therefore, functional localization of eloquent cortex or subcortical fiber tracts can enhance the EOR and functional outcome. Imaging techniques such as functional MRI and diffusion tensor imaging fiber tracking, and neurophysiological methods like navigated transcranial magnetic stimulation and magnetoencephalography, make it possible to identify eloquent areas prior to resective surgery and to tailor indication and surgical approach but also to assess the surgical risk. Intraoperative monitoring with direct cortical stimulation and subcortical stimulation enables surgeons to preserve essential functional tissue during surgery. Through tailored pre- and intraoperative mapping and monitoring the EOR can be maximized, with reduced rates of surgery-related deficits.

KEYWORDS: CST = corticospinal tract; DCS = direct cortical stimulation; DTI-FT = diffusion tensor imaging fiber tracking; EOR = extent of resection; GTR = gross-total resection; LGG = low-grade glioma; MEG = magnetoencephalography; MEP = motor evoked potential; SCS = subcortical stimulation; cortical regions; direct cortical stimulation; eloquent; fMRI = functional MRI; glioma; mapping; monitoring; nTMS = navigated transcranial magnetic stimulation

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