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LETTER

Diffusion Tensor Imaging for Evaluating Postoperative Outcomes of Supratentorial Glioma in the Motor Function Area [Letter]

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Dear editor

Gliomas represent about 30% of tumors of the central nervous system (CNS)[1] and, in adults, about 70% of these are supratentorial.[2] The most successful treatment involves chemotherapy, radiotherapy and surgical resection with at least 2 cm of margin,[3] and studying peritumoral white matter pathways preoperatively is relevant enabling early assessment of risk and reduction of neurological complications. Diffusion tensor imaging (DTI) is a tool for mapping relevant axonal tracts since it relies on magnetic resonance imaging (MRI) technology to offer a noninvasive and precise method for individually observing major pathways in the brain.[4]

Duy Hung et al assess if preoperative DTI mapping is a reliable method for predicting motor function impairment after resection.[5] The article is a retrospective study of 43 patients who underwent navigation-guided surgery for histopathologically confirmed supratentorial glioma in motor function area after preoperative observation with MRI conventional and DTI sequences, all of whom also underwent pre- and postoperative clinical evaluation concerning motor function. It demonstrates a correlation between DTI observed tumoral infiltration and clinical motor impairment levels, showing that patients with greater infiltration tend to have a worst motor function prognosis. They concluded that DTI should be used in a preoperative context for better planning of surgical resection of supratentorial gliomas and predict motor function outcomes.

We deem important to discuss methodological limitations regarding a possible selection bias, DTI analysis, lack of a control group and weak outcome measurement.

The article features a small sample from a single healthcare center, weakening its generalization potential. Also, the selection and inclusion criteria are not clearly defined. The study reports that patient records were surveyed for clinical data, including the pre- and postoperative Karnofsky Performance Status (KPS) score and muscle strength evaluation according to the British Medical Research Council (MRC) scale, but it does not mention how the patients were deemed eligible. We considered this a limitation since several confusion factors may have been overlooked, which could otherwise change the outcome of the study.

Furthermore, DTI observation was based on color hues, which represent the craniocaudally oriented corticospinal tract but also contain thalamocortical radiations to the motor and sensory cortex. Fiber tracking could add conspicuity for detecting corticospinal fibers in corona radiata and their spatial relation with the tumor.

The article does not mention the inclusion of a control group and is based on the comparison of pre- and postoperative motor function, showing that DTI results are predictive of resection-related impairment degree. However, it is relevant to compare postoperative outcome between patients who underwent preoperative DTI with a control group. It is appropriate to investigate if DTI usage could significantly improve postoperative functional outcome.

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Finally, the study measures outcome based on the British MRC scale for physical strength and the KPS score for general well-being. Although these are well-established systems, the authors do not explain why they have selected such methods. This can bias the study since patients could experience complications attributable to tumor resection that are not assessed by both scores, especially considering non-motor neurological complications.

Disclosure

The authors report no conflicts of interest in this communication.

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