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CENTRAL NERVOUS SYSTEM TUMORS

Development of practice algorithms to guide treatment planning with TTFields for the management of glioblastoma (GB).

Erin M. Dunbar, Fabio Massaiti Iwamoto, John E. Trusheim, Nimish Mohile, James Battiste, Jennifer Marie Connelly, ...

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Abstract Disclosures

Abstract

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Background: TTFields are a key modality in the management GB, and are delivered to patients in 2 paired orthogonal planes via direct application of transducer arrays to the shaved scalp. Array placement is planned through the NovoTAL software using MRI morphometric head size and tumor location measurements. As TTFields non-uniformly distribute through the brain parenchyma, treatment planning aims to optimize field intensity delivered to the tumor. Tumor location is obtained from fixed origins at the level of the scalp to the borders of active tumor in axial and coronal views. GB can be radiographically heterogeneous, presenting with enhancing and/or nonenhancing areas on imaging. Newly diagnosed GB patients may receive TTFields following a gross total resection with no post-op MRI enhancement. Interpreting imaging in recurrent GB may be complicated due to the effects of prior therapies and patterns of recurrence. Thus, clinical guidance is needed for physicians to appropriately plan TTFields across a spectrum of clinical scenarios. **Methods:** Neuro-oncologists with significant collective TTFields planning experience (mean 31, range 15-68 cases in 2015) collaboratively developed TTFields treatment planning algorithms, which have been prospectively incorporated into practice guidelines developed for the multi-disciplinary team caring for GB patients. **Results:** Comprehensive treatment planning algorithms were developed for enhancing and non-enhancing tumors in the newly diagnosed and recurrent GB settings, for multi-focal and gross totally resected tumors, and for assessing response to therapy in these various clinical scenarios. Guidance has also been developed for re-planning therapy based on sequential imaging changes. **Conclusions:** TTFields in combination with TMZ have improved overall survival in newly diagnosed GB. As TTFields become increasingly incorporated into standard GB management, clinical practice guidelines are acutely needed in order to optimize efficacy and outcomes via standardization of treatment across patients and institutions. The development of these algorithms represents the first-ever clinical practice guidelines for the use of TTFields in GB.