Central Meningioma Necrosis after CAR T-Cell Therapy
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Objective: To describe the clinical course, neuroimaging, and histopathologic findings of a patient with a presumed meningioma, who underwent Chimeric Antigen Receptor (CAR) T-Cell therapy for diffuse large B-cell lymphoma (DLBCL).

Background: Genetically engineered T-Cells are a promising treatment for refractory malignancies, but are associated with CAR T cell related encephalopathy syndrome (CRES). CRES occurs in at least 80% of patients, and is characterized by impairments in attention, language, and arousal. As clinical trials excluded patients with underlying neurologic abnormalities, the safety of CAR T-cells in these patients warrants further investigation.

Design/Methods: Neurologic assessments were performed every 8 hours using the CARTOX-10 rating scale. CRES was graded on a scale of 1-4, representing mild to critical neurotoxicity (Neelapu et al. Nat Rev Clin Onc 2018).

Results: A 71 year-old woman with refractory DLBCL received CD19-targeting CAR T-cells (axicabtagene ciloleucel). Baseline brain MRI revealed a uniformly enhancing 1.9 x 2.9 x 2.3 cm extra-axial mass and peritumoral edema in the inferior frontal lobe, consistent with an olfactory groove meningioma. On hospital day 5, she developed severe obtundation (CRES grade 4), prompting initiation of high-dose steroids and transfer to the neuro-ICU for 48 hours. MRI brain, EEG monitoring and CSF analysis during the acute phase were unrevealing. Although her mental status initially improved, she became inattentive and abulic every time steroids were tapered off. On day 50, a follow-up brain MRI showed increased vasogenic edema and new necrosis within the extra-axial mass. Neurosurgical resection of the tumor led to marked improvement in cognition. Final histopathology revealed a WHO grade II meningioma with infiltration by CD8+ cytotoxic T-cells.

Conclusions: We present a unique case of CRES related to meningioma necrosis and T-cell invasion. Although CAR T-cells are feasible in patients with underlying intracranial mass lesions, the risk for severe neurotoxicity is high, requiring close-monitoring and vigilance.