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Low-grade glioma of the temporal lobe and tumor-related epilepsy in children

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Abstract

Purpose: Low-grade glioma is the most common brain tumor among children and adolescents. When these tumors arise in the temporal lobe, patients frequently present with seizures that are poorly controlled with antiepileptic drugs. Here we summarize the clinical features, pathophysiology, preoperative evaluation, surgical treatment, and outcomes of pediatric patients with low-grade gliomas in the temporal lobe.

Methods: We reviewed the literature on pediatric low-grade gliomas in the temporal lobe, focusing on cohort studies and systematic reviews that described surgical treatment strategies and reported both oncologic and epilepsy outcomes.

Results: The differential diagnoses of pediatric low-grade gliomas in the temporal lobe include ganglioglioma, dysembryoplastic neuroepithelial tumor, desmoplastic infantile ganglioglioma, papillary glioneuronal tumor, pilocytic astrocytoma, pleomorphic xanthoastrocytoma, angiocentric glioma, and polymorphous low-grade neuroepithelial tumor of the young. There is no consensus on the optimal surgical approach for these tumors: lesionectomy alone, or extended lesionectomy with anterior temporal lobectomy, with or without removal of mesial temporal structures. Gross total resection and shorter preoperative duration of epilepsy are strongly associated with favorable seizure outcomes, defined as Engel Class I or Class II, approaching 90% in most series. The risk of surgical complications ranges from 4 to 17%, outweighing the lifetime risks of medically refractory epilepsy.

Conclusion: Pediatric patients with temporal low-grade glioma and tumor-related epilepsy are best managed by a multidisciplinary epilepsy surgery team. Early and appropriate surgery leads to prolonged survival and a greater likelihood of seizure freedom, improving their overall quality of life.

Keywords: Developmental brain tumor; Dysembryoplastic neuroepithelial tumor; Ganglioglioma; Long-term epilepsy-associated tumor; Low-grade glioma; Temporal lobe epilepsy.