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Recurrence Patterns and Surveillance Imaging in Pediatric Brain Tumor Survivors

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Abstract

Surveillance magnetic resonance imaging (MRI) is routinely used to detect recurrence in pediatric central nervous system (CNS) tumors. The frequency of neuroimaging surveillance varies without a standardized approach. A single-institutional retrospective cohort study evaluated the frequency of recurrences. This study included 476 patients with the majority diagnosed with low-grade glioma (LGG) (n=138, 29%), high-grade glioma (HGG) (n=77, 16%), ependymoma (n=70, 15%), or medulloblastoma (n=61, 13%). LGG, HGG, and ependymoma patients more commonly had multiply recurrent disease (P=0.08), with ependymoma patients demonstrating ≥ 2 relapses in 47% of cases. Recurrent disease was identified by imaging more often than clinical symptoms (65% vs. 32%; P=<0.01). Patients diagnosed with meningioma demonstrated the longest mean time to first relapse (74.7 mo) whereas those with atypical teratoid rhabdoid tumor and choroid plexus carcinoma tended to have the shortest time to relapse (8.9 and 9 mo, respectively). Overall, 22 patients sustained first relapse >10 years from initial diagnosis. With a higher tendency toward detection of tumor recurrence/progression on MRI surveillance in comparison to clinical progression, surveillance imaging is necessary in routine follow up of pediatric CNS tumor survivors. With some relapses >10 years from initial diagnosis, imaging beyond this time point may be useful in particular tumor types. While the study is limited in outcome analysis, earlier detection of recurrence would lead to earlier initiation of treatment and implementation of salvage treatment regimens which can impact survival and quality of life.

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