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Clinical characteristics and radiological features of glioblastoma, IDH-wildtype, grade 4 with histologically lower-grade gliomas

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Abstract

The 2021 World Health Organization (WHO) classification of central nervous system tumors applied molecular criteria and further integrated histological and molecular diagnosis of gliomas. This classification allows for the diagnosis of isocitrate dehydrogenase wild-type (IDHwt) glioblastoma (GBM), and WHO grade 4 with histologically lower-grade gliomas (LrGGs), even in the absence of high-grade histopathologic features, such as necrosis and/or microvascular proliferation. They contain at least one of the following molecular features: epidermal growth factor receptor amplification, chromosome 7 gain/10 loss, or telomerase reverse transcriptase promoter mutation. In the imaging features at the time of histological diagnosis, a gliomatosis cerebri growth pattern was frequently observed in these tumors. Furthermore, this growth pattern was significantly higher in IDHwt GBM, WHO grade 4, with histological grade II gliomas. Although the exact prognosis of IDHwt GBM, WHO grade 4, with histologically LGGs remains unknown, its OS was approximately 1-2 years similar to that of histologically IDHwt GBM, WHO grade 4, despite histopathological features similar to IDHmut LrGGs. These findings reinforce the need for the analysis of molecular features, regardless of presenting similar clinical characteristics and imaging features to IDHmut LrGGs.

Keywords: Glioblastoma; Gliomatosis cerebri growth patterns; Histologically lower-grade gliomas; IDH wild-type; The 2021 WHO classification; WHO grade 4.

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