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Molecular neuropathology of low-grade gliomas and its clinical impact.

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The term "low-grade glioma" refers to a heterogeneous group of slowly growing glial tumors corresponding histologically to World Health Organization (WHO) grade I or II. This group includes astrocytic, oligodendroglial, oligoastrocytic and ependymal tumor entities, most of which preferentially manifest in children and young adults. Depending on histological type and WHO grade, growth patterns of low-grade gliomas are quite variable, with some tumors diffusely infiltrating the surrounding central nervous system tissue and others showing well demarcated growth. Furthermore, some entities tend to recur and show spontaneous malignant progression while others remain stable for many years. This review provides a condensed overview concerning the molecular genetics of different glioma entities subsumed under the umbrella of low-grade glioma. For a better understanding the cardinal epidemiological, histological and immunohistochemical features of each entity are shortly outlined. Multiple cytogenetic, chromosomal and genetic alterations have been identified in low-grade gliomas to date, with distinct genetic patterns being associated with the individual tumor subtypes. Some of these molecular alterations may serve as a diagnostic adjunct for tumor classification in cases with ambiguous histological features. However, to date only few molecular changes have been associated with clinical outcome, such as the combined losses of chromosome arms 1p and 19q as a favorable prognostic marker in patients with oligodendroglial tumors.

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