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Cytological features of diffuse and circumscribed gliomas

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Abstract

The current World Health Organization classification of gliomas is based on morphological, genetic, and molecular parameters. In this review, we intend to present the most relevant cytological features of these tumours, with a particular focus on their analysis during intraoperative studies. Rapid diagnosis is required in this context, and at present it is not possible to evaluate the genetic or molecular profile of a tumour intraoperatively. New terminology and diagnostic parameters have been introduced, but the essence of intraoperative recognition remains the same. The main challenge in astrocytoma IDH-mutant, grade 2 is recognising the tissue as neoplastic. Since glioma grades 3 and 4 are assigned based on histological and genetic variables that are not necessarily measurable on cytology, the term high-grade glioma is often used for intraoperative diagnosis. Oligodendroglioma, IDH-mutant and 1p/19q-codeleted shows peculiar cytological findings as well as the common subtypes of glioblastoma IDH-wildtype (giant cell, epithelioid, gliosarcoma and small cell). Many of the paediatric-type-diffuse gliomas have been described very recently and there are no cytological reports of proven cases. Finally, pilocytic astrocytoma, pleomorphic xanthoastrocytoma, subependymal giant cell astrocytoma, chordoid glioma, and astroblastoma MN1-altered constitute the group of circumscribed astrocytic gliomas. They are remarkable entities that the pathologist must be able to recognise since most are low-grade neoplasms that can show atypical morphological features.

Keywords: astrocytoma; cytology; glioblastoma; gliomas; intraoperative cytology.