Central neurocytomas may derive from neuroglial precursor cells with the potentiality of dual differentiation because there is some evidence for both glial and neuronal differentiation in some tumors [1) 2) 3) 4) 5) 6) 7)].

Central neurocytomas demonstrate neuronal differentiation and histologically appear similar to oligodendrogliomas. This has historically has resulted in many tumours erroneously categorised. They lack co-deletion of 1p19q which is characteristic of oligodendroglioma. The cells are typically uniform and round with a salt and pepper appearance.

The tumor is composed of small round cells with neuronal differentiation.

The initial description classified them as WHO grade I lesions, however this was upgraded in 1993 to WHO grade II as it was recognised that at least some of these tumours exhibited more aggressive behaviour 10.

Markers

Purely neuronal origin is demonstrated positivity to neuronal markers such as:

synaptophysin

neuronal specific enolase

Variants

Ganglioneurocytoma: shows differentiation towards ganglion cells.

Neumann et al. analyzed histomorphology, clinical parameters, and global DNA methylation of tumors with the initial histological diagnoses of tanycytic (n = 12), clear cell (n = 14), or papillary ependymoma (n = 19). Forty percent of these tumors did not match to the epigenetic profile of ependymomas, using a previously published DNA methylation-based classifier for brain tumors. Instead, they were classified as low-grade glioma (n = 3), plexus tumor (n = 2), CNS high-grade neuroepithelial tumor with MN1 alteration (n = 2), papillary tumor of the pineal region (n = 2), neurocytoma (n = 1), or did not match to any known brain tumor methylation class (n = 8) [8)].

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