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Glioblastoma, IDH-wildtype, with oligodendrocyte-like cells: a microscopic challenge

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A 71-year-old woman, who underwent surgery for a meningioma 13 years earlier, presented with an expansive lesion in the left cerebellar hemisphere at her last neuroradiological follow-up check, which was surgically excised. Microscopy showed a glial neoplasm (immunohistochemically positive for GFAP and Olig2) with: increased cellularity, atypia, mitosis and vascular proliferation. Noteworthy it is the presence of numerous round neoplastic cells with a clear perinuclear halo (fig. 1A–1B), areas of 'chicken-wire' vascularization and microcalcifications: these constitute the classic histologic features of oligodendroglioma (OG). However, this morphological hypothesis was not supported by the molecular investigations, which instead showed a non-oligodendroglial lineage profile: IDH-wildtype by immunohistochemistry (fig. 1C) and 1p/19q non co-deleted (investigated by FISH method). On the basis of the integration of morpho-molecular data, the definitive diagnosis was therefore that of glioblastoma (GB), IDH-wildtype, with oligodendrocyte-like cells (GBO). GBO is a rare histological pattern of GB, reported in the latest World Health Organization classification of central nervous system tumours of 2021 [1], which should not be misdiagnosed as OG. Although both entities constitute forms of diffuse gliomas, distinguishing GBO from OG is not only a fine histological difference, but also and above all constitutes precise and important clinical-therapeutic information. Indeed, the two neoplasms differ in both their biological behaviour and prognosis, which are worse for GBO [1]. But even more important is the message that increasingly new differences are emerging in the molecular targets of medical therapy of the different types of glioma, some already approved and employed, others still undergoing clinical or laboratory studies [2].

Article information and declarations

Ethics statement

All procedures performed are in accordance with the Helsinki Declaration.

Author contributions

Gabriele Gaggero – is responsible for the conception and drafting of the article.

Giulio Fraternali Orcioni – contribute to the drafting of the article and is responsible for editing the images.
Fabrizio Giordano – contribute to the drafting of the article and is responsible for the bibliography.

Valerio Gaetano Vellone – is responsible for the supervision of the article.

Conflict of interest

None declared

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References

1. Louis DN, Perry A, Wesseling P, et al. The 2021 WHO Classification of Tumors of the Central Nervous System: a summary. Neuro Oncol. 2021 Aug 2;23(8):1231-1251. doi: 10.1093/neuonc/noab106. PMID: 34185076; PMCID: PMC8328013.

2. Muzyka L, Goff NK, Choudhary N, et al. Systematic Review of Molecular Targeted Therapies for Adult-Type Diffuse Glioma: An Analysis of Clinical and Laboratory Studies. Int J Mol Sci. 2023 Jun 21;24(13):10456. doi: 10.3390/ijms241310456. PMID: 37445633; PMCID: PMC10341773.

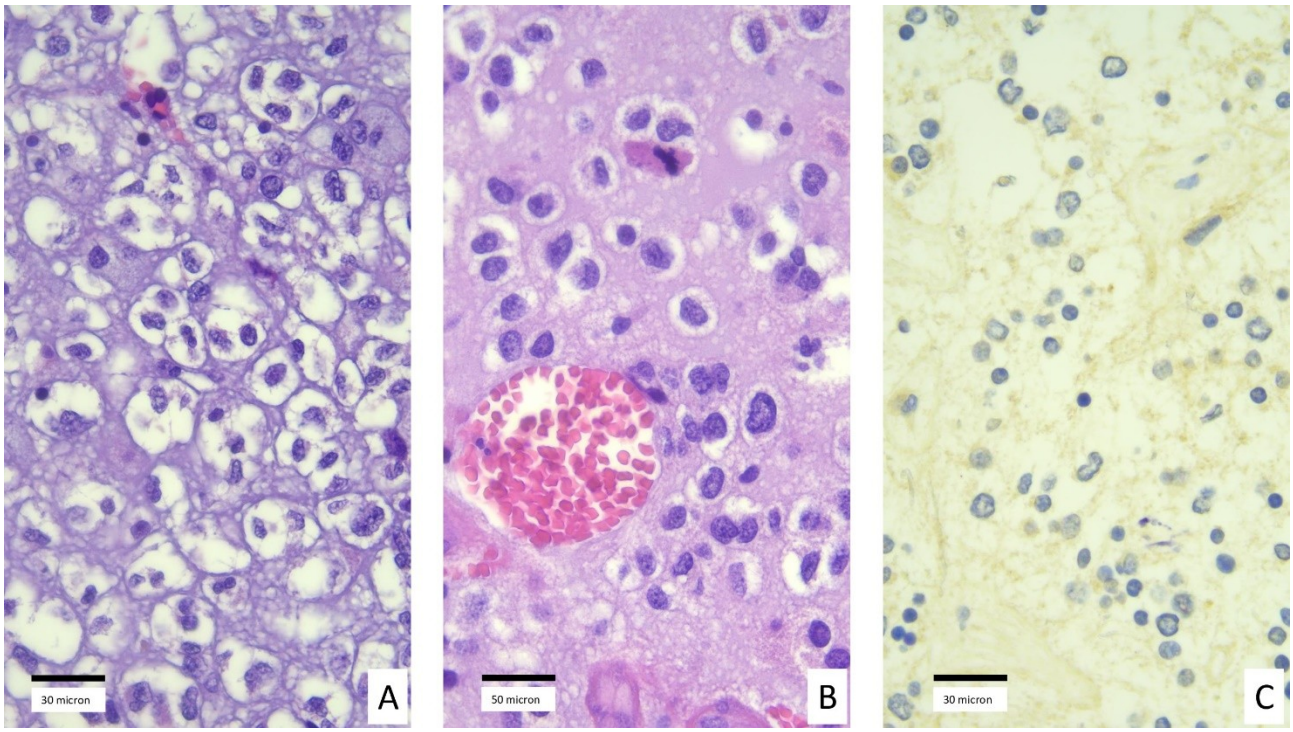

Figure 1. (A) Photomicrograph (haematoxylin-eosin stain, 40x), showing a neoplasm with oligodendroglioma-like aspects, i.e. round cells with clear perinuclear halos. (B) Photomicrograph (Haematoxylin-Eosin stain, 60x), where mitosis is evident. (C) Immunohistochemistry for IDH R132H negative, indicating an IDH-wild type profile (magnification: 40x)