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Oligoastrocytoma: The Vanishing Entity With True Dual Genotype, a Report, its Molecular Profiles and Review of Literature

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Abstract

Isocitrate dehydrogenase (IDH) mutant gliomas are classified as astrocytoma or oligodendroglioma based on the recent application of *ATRX* mutation, *TP53* mutation, and 1p/19q co-deletion. Astrocytomas classically show *ATRX* and *TP53* mutations, whereas oligodendrogliomas are defined by 1p/19q co-deletion. However, there are reports of gliomas that harbor both astrocytoma and oligodendroglioma morphologically and molecularly. Here we present a patient of a 29-year-old woman who presented with a headache and underwent gross total excision. Magnetic resonance imaging showed a right frontal space-occupying lesion with T2 fluid-attenuated inversion recovery mismatch. Histology showed 2 distinct areas of morphology compatible with oligodendroglioma and astrocytoma. Immunohistochemistry showed both components being positive for IDH R132H. Alpha thalassemia/mental retardation syndrome X-linked (ATRX) showed loss of nuclear expression and p53 was strongly positive in the morphologic astrocytoma component, whereas ATRX was retained and p53 was negative in the morphologic oligodendroglioma component. Fluorescence in situ hybridization showed 1p/19q co-deletion in the oligodendroglioma component while co-deletion was absent in the astrocytoma component. *TERT* mutation was present in the oligodendroglioma component, whereas it was absent in the astrocytoma component. Although rare, gliomas harboring both oligodendroglioma and astrocytoma components in a single tumor exist and show genetically distinct areas.

Keywords: 1p/19q co-deletion; TERT; astrocytoma; oligodendroglioma.