Diffuse astrocytoma differential diagnosis

Reactive gliosis is a response of glial tissue to different types of injury such as brain abscess, trauma, hemorrhage, or even neoplastic process. In some circumstances, especially when the tissue biopsy is small, there may be difficult to discriminate this reactive condition with low-grade diffuse astrocytoma (World Health Organization [WHO] grade II) by conventional hematoxylin and eosin (H&E) slides, so some immunohistochemical and molecular markers have been introduced for this differential diagnosis. One of the important aspects of the updated WHO classification in 2016 has been dividing some of the glial tumors according to IDH1 (isocitrate dehydrogenase 1) mutation.

The most commonly used markers to differentiate astrocytoma from astrocytosis are immunohistochemical stains for glial fibrillary acid protein (GFAP), proliferation markers (e.g. Ki-67), and p53.

In a study, Geramizadeh et al. tried to evaluate IDH1 and P53 mutation by immunohistochemistry as a simple and highly specific, and sensitive method to differentiate low-grade astrocytoma and reactive gliosis.

For 5 years (2013-2018), 50 cases of clinically documented reactive gliosis and 50 cases of low-grade astrocytoma were evaluated for the presence or absence of IDH1 and P53 mutation by immunohistochemistry.

Isocitrate dehydrogenase 1 was positive in 92% and 4% of the astrocytoma and reactive gliosis cases and P53 was positive in 90% and 4% of the cases with the final diagnosis of astrocytoma and reactive gliosis, respectively.

The combination of P53 and IDH1 as an immunohistochemical panel showed a specificity of 96% and sensitivity of 91% for differential diagnosis of reactive gliosis and low-grade astrocytoma. These 2 markers can be extremely helpful for this differential diagnosis [1)].

1)
Geramizadeh B, Kohandel-Shirazi M, Soltani A. A Simple Panel of IDH1 and P53 in Differential Diagnosis Between Low-Grade Astrocytoma and Reactive Gliosis. Clin Pathol. 2021 Feb 11;14:2632010×20986168. doi: 10.1177/2632010×20986168. PMID: 33634261; PMCID: PMC7887675.