Anaplastic pleomorphic xanthoastrocytoma

Anaplastic pleomorphic xanthoastrocytoma (PXA) is a newly recognized entity in the World Health Organization Classification of Tumors of the Central Nervous System 2016, characterized by elevated mitotic activity with or without necrosis, and shorter survival when compared with WHO grade II PXAs. BRAF V600E mutations are frequent.

Some anaplastic pleomorphic xanthoastrocytomas (PXA) were reported to have extremely poor prognosis which showed a type of pediatric glioblastoma (Glioblastoma) molecular profile. Recent integrated molecular classification for primary central nervous system tumors proposed some differences between histological and molecular features. Herein, in a genome-wide molecular analysis, Nakamura et al., showed an extreme aggressive anaplastic PXA that resulted in a pediatric Glioblastoma molecular profile. A full implementation of the molecular approach is the key to predict prognosis and decide the treatment strategy for anaplastic PXA [1)].

Treatment

While grade II PXAs can often be managed surgically, there is no consensus on the optimal treatment for anaplastic PXA. Rarely, anaplastic PXA can present with leptomeningeal dissemination (LMD), which is associated with poor prognosis.

Case reports

A 48-year-old healthy gentleman presented with progressive right upper limb weakness. CT and MRI of the brain were done, which showed an intra-axial supratentorial tumor. A diagnosis of high-grade glioma was initially made based on its imaging features. The histopathological study came back as anaplastic pleomorphic xanthoastrocytoma. After a discussion with the neurosurgical and oncology teams, a decision was made to treat the patient with radiotherapy. In this case report, we describe a rare case of PXA with anaplastic characteristics [2)].

In a report Purkait et al., from the All India Institute of Medical Sciences, Bhubaneswar, India.describe a BRAF V600E-mutated tumor with divergent morphological appearance comprising of anaplastic pleomorphic xanthoastrocytoma and astroblastoma. Both of these tumor entities are extremely rare and a combined morphology has not been described till now [3)].

A 16-year-old girl diagnosed with a left frontal anaplastic PXA with BRAF V600E mutations and high grade features of necrosis. Following subtotal resection, cranial radiation, and temozolomide chemotherapy her tumor recurred with bulky, nodular LMD throughout the cervical, thoracic, and lumbar spine. She received palliative radiation to the thoracic spine and then started targeted therapy with dabrafenib with a partial radiographic response and then trametinib was added to dabrafenib with sustained response for 5 months. When the leptomeningeal tumor progressed, bevacizumab was

added to the dabrafenib and trametinib therapy, and the patient remained stable for an additional 4 months. The combined therapy was very well tolerated; the patient experienced a grade II rash with initiation of dabrafenib, but no other side effects. To our knowledge this is the first time dabrafenib, trametinib, and bevacizumab have been combined to treat a pediatric high-grade glioma . This is also the first report of BRAF inhibition in glial LMD. Our experience suggests that targeted therapy with dabrafenib and trametinib can be safely combined with anti-angiogenic therapy and may improve quality of life and survival in patients with LMD associated with high grade PXA. The growing experience with targeted therapy in rare pediatric gliomas may justify a need for a larger clinical trial [4].

1)
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