Cerebellar pilocytic astrocytoma case reports

A 5-year-old female patient who was admitted to our hospital because of a cerebellar hemispheric astrocytoma associated with obstructive hydrocephalus and accompanied by 2 syringomyelic cavities in the cervicothoracic portion of the spinal cord. Immediately after gross total resection of the lesion, impaired mobility of the upper and lower extremities was observed, a finding that was not consistent with intraoperative neurophysiologic monitoring data. Hydrogen peroxide had been judiciously used to irrigate the resection tumor cavity. In the next few postoperative days, the patient suffered from transient diabetes insipidus and hyperpyrexia, indicative of hypothalamic injury.

Neurological evaluation of the patient, after stabilization of her medical condition, revealed residual spasticity of upper and lower extremities, rendering her able to mobilize via the aid of a wheelchair only. The most possible pathophysiologic explanation of her neurological deterioration, including hypothalamic dysfunction, was analyzed. The role of hydrogen peroxide as a source of free radical formation and its co-responsibility for vascular platelet aggregation and vasoconstriction was considered, upon case review, the main responsible etiologic factor [1)].

2018

A 47-year-old- lady with a posterior fossa pilocytic astrocytoma underwent surgical decompression. She developed multiple early local recurrences Along with malignant transformation of the cranial lesion she developed skeletal dissemination within a very short time frame. There were no features or family history of Neurofibromatosis type 1. She did not receive radiotherapy or chemotherapy prior to the recurrences [2)].

2015

A 72-year old female with a right cerebellar pilocytic astrocytoma WHO grade I with an Isocitrate dehydrogenase 1 (IDH1) R132H mutation. The patient is recurrence-free 6 years after the initial diagnosis. Only one single case with strikingly similar clinicopathological features has been reported before. Otherwise, IDH1/2 mutations are not seen in pilocytic astrocytomas. The clinical implications of these findings are discussed [3)].

Two cases of fatal hemorrhagic cerebellar PAs: one of a child with a slowly growing stereotypical WHO Grade I PA with a 1-year period of symptomatology that preceded a rapid clinical deterioration, and another of an asymptomatic child having a PA variant, presenting with progressive obtundation following a presumed Valsalva event. These two scenarios parallel previous reports in the literature of either a setting of progressive expression of cerebellar dysfunction and transient episodes of raised intracranial pressure (ICP), or abrupt onset of features of increased ICP in a previously well child. The literature is further reviewed for a current understanding of the factors that predispose, initiate and propagate bleeding, with specific reference to the role of vascular endothelial growth factor and other angiogenic agents in the genesis and stability of the vasculature in PAs. In this context, we propose that obliterative vascular mural hyalinization with associated altered flow dynamics and microaneurysm formation was the pathogenesis of the hemorrhage in our first case. In the second case, large tumor size, increased growth rate, looseness of the background myxoid matrix, and

thinness of the tumor blood vessels with calcospherite deposition predisposed to vascular leakage and bleeding concurrent with sudden increases in intravascular hydrostatic pressure. In that cerebellar PAs are common, this report underscores the importance of considering in the differential diagnosis the possibility of a spontaneous hemorrhage in a posterior fossa PA in a child presenting with a sudden neurological ictus and raised ICP [4].

1)

Panagopoulos D, Antoniades E, Karydakis P, Giakoumettis D, Themistocleous M. Postoperative Tetraplegia to a Child after Cerebellar Pilocytic Astrocytoma Excision at Prone Position: Case Report and Literature Review. Am J Case Rep. 2020 Mar 12;21:e920213. doi: 10.12659/AJCR.920213. PubMed PMID: 32161253; PubMed Central PMCID: PMC7081953.

2)

Konar SK, Nandeesh BN, Sandhya M, Chandana N, Devi BI, Bhat DI. Pilocytic astrocytoma with spontaneous malignant transformation with intracranial and skeletal dissemination: case report and review of the literature. Br J Neurosurg. 2018 May 10:1-4. doi: 10.1080/02688697.2018.1472214. [Epub ahead of print] PubMed PMID: 29745267.

3)

Behling F, Steinhilber J, Tatagiba M, Bisdas S, Schittenhelm J. IDH1 R132H mutation in a pilocytic astrocytoma: a case report. Int J Clin Exp Pathol. 2015 Sep 1;8(9):11809-13. eCollection 2015. PubMed PMID: 26617931; PubMed Central PMCID: PMC4637747.

4)

Wilson MP, Johnson ES, Hawkins C, Atkins K, Alshaya W, Pugh JA. Hemorrhagic presentations of cerebellar pilocytic astrocytomas in children resulting in death: report of 2 cases. J Neurosurg Pediatr. 2016 Apr;17(4):446-52. doi: 10.3171/2015.10.PEDS1580. Epub 2015 Dec 18. PubMed PMID: 26684764.