Pediatric intracranial tumor

- Higher healthcare use before paediatric multiple sclerosis onset: a nationwide cohort study
- Methylation and gene expression patterns in adamantinomatous craniopharyngioma highlight a panel of genes associated with disease progression-free survival
- Multifaceted Roles of Guanylate-Binding Proteins in Cancer
- Recent Advances in Brain Cancers
- Pott's Puffy Tumor in the Adult Population: Systematic Review and Meta-Analysis of Case Reports
- Applications of Advanced Imaging for Radiotherapy Planning and Response Assessment in the Central Nervous System
- Longitudinal Overlap and Metabolite Analysis in Spectroscopic MRI-Guided Proton Beam Therapy in Pediatric High-Grade Glioma
- ETMR stem-like state and chemo-resistance are supported by perivascular cells at single-cell resolution

The common pediatric brain tumors (age < 20 years) are gliomas and glioneuronal tumors (cerebellum, brainstem, and optic nerve) (which account for 45% of primary CNS tumors in this age group), embryonal tumors (12.3%) (67% of which are medulloblastoma), pituitary tumors (6.2%), nerve sheath tumors (4.2%), and craniopharyngiomas (3.8%).

Among patients < 20 years of age, the incidence of the following tumors decreases with age: pilocytic astrocytoma, malignant glioma, ependymal tumors, choroid plexus tumors, and embryonal tumors.

Intracranial neoplasms during the first year of life

Brain tumors presenting during the first year of life are a different subset of tumors than those presenting later in childhood. In a busy neurosurgical unit in a children’s hospital, they represented ≈ 8% of children admitted with brain tumors, an average of only ≈ 3 admissions per year.

90% of brain tumors in neonates are of neuroectodermal origin, teratoma being the most common. Some of these tumors may be congenital. Other supratentorial tumors include astrocytoma, choroid plexus tumors, ependymomas, and craniopharyngiomas.

Posterior fossa tumors include medulloblastoma and cerebellar astrocytoma.

Many of these tumors escape diagnosis until they are very large in size due to the elasticity of the infant skull, the adaptability of the developing nervous system to compensate for deficits, and the difficulty in examining a patient with a limited neurologic repertoire and inability to verbalize or cooperate. The most common presenting manifestations are vomiting, arrest or regression of psychomotor development, macrocrania, and poor feeding/failure to thrive. They may also present with seizures.

Epidemiology

Pediatric Intracranial Tumor Epidemiology.

Classification

Pediatric intracranial tumor classification.

Diagnosis

Bächli et al., from the Heidelberg University Hospital, Germany, report a single-institutional collection of pediatric brain tumor cases that underwent a refinement or a change of diagnosis after completion of molecular diagnostics that affected clinical decision-making including the application of molecularly informed targeted therapies. 13 pediatric central nervous system tumors were analyzed by conventional histology, immunohistochemistry, and molecular diagnostics including DNA methylation profiling in 12 cases, DNA sequencing in 8 cases and RNA sequencing in 3 cases. 3 tumors had a refinement of diagnosis upon molecular testing, and 6 tumors underwent a change of diagnosis. Targeted therapy was initiated in 5 cases. An underlying cancer predisposition syndrome was detected in 5 cases. Although this case series, retrospective and not population based, has its limitations, insight can be gained regarding precision of diagnosis and clinical management of the patients in selected cases. Accuracy of diagnosis was improved in the cases presented here by the addition of molecular diagnostics, impacting clinical management of affected patients, both in the first-line as well as in the follow-up setting. This additional information may support the clinical decision making in the treatment of challenging pediatric CNS tumors. Prospective testing of the clinical value of molecular diagnostics is currently underway [1)].

Treatment

Pediatric intracranial tumor treatment.

Complications

see Pediatric intracranial tumor complications.

Outcome

Pediatric intracranial tumor outcome.

Case series

Pediatric intracranial tumor case series.

1)

Bächli H, Ecker J, van Tilburg C, Sturm D, Selt F, Sahm F, Koelsche C, Grund K, Sutter C, Pietsch T, Witt H, Herold-Mende C, von Deimling A, Jones D, Pfister S, Witt O, Milde T. Molecular Diagnostics in

Pediatric Brain Tumors: Impact on Diagnosis and Clinical Decision-Making - A Selected Case Series. Klin Padiatr. 2018 Jul 11. doi: 10.1055/a-0637-9653. [Epub ahead of print] PubMed PMID: 29996150.