Diffuse intrinsic pontine glioma biopsy

- Exploring the tumor microenvironment in diffuse intrinsic pontine glioma: immunological insights and therapeutic challenges
- Post-radiation MR imaging features in Molecular and Mutational Analyses in Pontine Pediatric Diffuse Midline Gliomas
- An oncohistone-driven H3.3K27M/CREB5/ID1 axis maintains the stemness and malignancy of diffuse intrinsic pontine glioma
- Ophthalmic Presentation of Diffuse Intrinsic Pontine Glioma in Children (Case Series and Literature Review)
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Indications

Diffuse intrinsic pontine glioma biopsy indications

Diffuse intrinsic pontine glioma (DIPG) is a highly aggressive and rare type of brain tumor that primarily affects children. It typically arises in the pons, a part of the brainstem, making surgical removal or biopsy of the tumor a complex and risky procedure. However, in some cases, a biopsy may be performed to confirm the diagnosis and guide treatment decisions. Here's some information about the DIPG biopsy procedure:

Risks and Challenges: Biopsying a DIPG tumor is challenging due to its location in the brainstem, which controls vital functions such as breathing, heart rate, and swallowing. A biopsy can carry significant risks, including damage to critical brain structures, bleeding, and potential worsening of neurological symptoms.

Stereotactic Biopsy: To minimize these risks, a stereotactic biopsy is often used. In this procedure, a neurosurgeon uses specialized imaging techniques (such as MRI or CT scans) and computer guidance to precisely target and extract a small tissue sample from the tumor. The goal is to obtain enough tissue for diagnosis while minimizing damage to surrounding healthy brain tissue.

Anesthesia: The procedure is performed under general anesthesia to ensure the patient remains completely still during the biopsy.

Diagnosis: The extracted tissue is then sent to a pathologist for analysis. The pathologist can determine the type and grade of the tumor, which helps guide treatment decisions. In the case of DIPG, the biopsy can confirm the presence of a glioma, but the prognosis is typically poor.

Treatment Considerations: Once the diagnosis is confirmed, treatment options can be discussed. Radiation therapy is often the primary treatment for DIPG due to its location and the aggressive nature of the tumor. Other treatments, such as chemotherapy or experimental therapies, may be considered in some cases.

It's important to note that the decision to perform a biopsy in DIPG cases is made carefully, taking into account the potential benefits and risks. The procedure is typically reserved for cases where the diagnosis is unclear or when participating in clinical trials that require tissue confirmation. Patients and their families should have thorough discussions with their medical team to understand the potential risks and benefits of a biopsy in the context of their specific situation.

The place of stereotactic biopsy in the management of Diffuses Intrinsic Pontine Gliomas (DIPG) in children has changed over the years.

Due to the improvement of neurosurgical technics, it regained credit. Moreover, the era of targeted therapy with molecular and genomic discoveries paved the way to research protocol that requires a biopsy to include the patient. Nonetheless, stereotactic biopsy remains a surgical procedure with its risks. A complication has never been reported in case of a biopsy of a DIPG : metastatic seeding along the tract of the biopsy. Beuriat et al report the first two cases in the literature [1)].

Nevertheless, most neurosurgical teams are reluctant to perform biopsy in pediatric patients, citing potential risks and lack of direct benefit. Yet, in reviewing 90 patients with and the published data on brainstem biopsy, these procedures have a diagnostic yield and morbidity and mortality rates similar to those reported for other brain locations. In addition, the quality and quantity of the material obtained confirm the diagnosis and inform an extended molecular screen, including biomarker study-information important to designing next-generation trials with targeted agents. Stereotactic biopsies can be considered a safe procedure in well-trained neurosurgical teams and could be incorporated in well-defined protocols for patients with DIPG [2)].

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Beuriat PA, Szathmari A, Di Rocco F, Kanold J, Mottolese C, Frappaz D. Diffuse Intrinsic Pontine Glioma in children : document or treat ? World Neurosurg. 2016 Jul 12. pii: S1878-8750(16)30533-2. doi: 10.1016/j.wneu.2016.07.011. [Epub ahead of print] PubMed PMID: 27422681.
2)
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