

Introduction

Effective treatment of diffuse intrinsic pontine gliomas (DIPG) in children remains elusive.^{2, 3} DIPG comprise 10-15% brain tumors but are the main cause of death in this group. Patients who suffer from DIPG have a poor outcome and low life expectancy. In addition to the tumors being nearly inoperable, there is no proven treatment to improve long-term prognosis. Though there is no exact known cause, intrinsic tumors of the thalamus and brainstem play a much larger role in pediatric patients rather than adult patients.⁴ The importance of using medical imaging modalities plays a large role in the help of diagnosing DIPG. Having a DIPG means having an inoperable tumor, this is because of the location being located primarily on the pons, a major structure of the brainstem.³ Because the tumor is located on a major structure of the brain, there are only limited options for treatment. Understanding all types of brain tumors is important, but high-grade gliomas and gliomas of the brainstem are limited to the research that can be performed.



Figure 1. Sagittal View of brain anatomy with arrow pointing to location of pons.¹

Diagnosis of DIPG

DIPG is known for the high mortality rate due to location; because the tumor is located in the pons (figure 1), a small, yet major structure of the brainstem. In regards to the DIPG having a poor long-term prognosis, the diagnosis of DIPG is made based on MRI criteria (figure 2 and figure 3). Upon the discovery of abnormal symptoms, it is important that the correct protocols are taken into consideration and medical imaging exams, if necessary, are ordered. Secondary medical imaging modalities assist in the majority of diagnosing DIPG, because a biopsy is not an option. Computed Tomography (CT) is used initially when imaging the brain. When abnormalities are discovered, patients are then referred to run more imaging tests such as Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) scanning. CT images are able to show more definite structures such as bones and calcifications; opposed to MRI showing differences in soft tissue densities.^{5, 6}



Figure 2. MRI Sagittal View showing glioma of the pons, medulla, and cervicomedullary junction.⁷

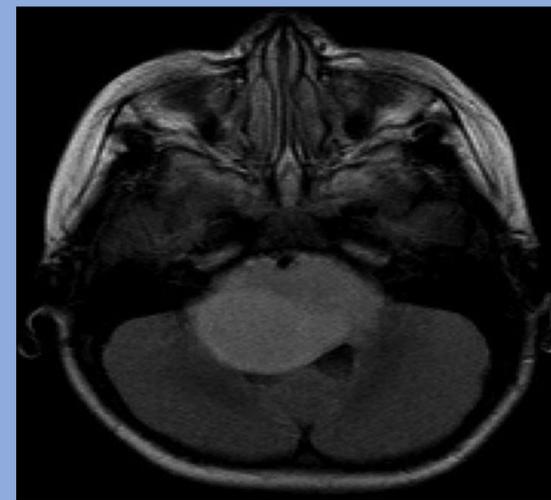


Figure 3. MRI Axial View of hyperintense tumor of the pons and brachium pontis.⁷

Treatment and Prognosis

A patient that has been recently diagnosed with DIPG will be given the news of the prognosis after diagnosis and treatment. Treatment can include radiation therapy and chemotherapy. Unfortunately, because of the high mortality rate from the glioma itself, some patients may opt out from receiving any form of treatment, other than palliative or comfort care. The location of the DIPG restricts access from any form of surgery, the glioma sits in the midbrain making it difficult to access from any surgical approach, this increases the chance of risk in the procedure which could end the life of the patient quicker than the glioma itself would. When the risks of a procedure begin to outweigh the benefits, the option does not present itself. If a patient opts out from all forms of therapy, postmortem procedures can be performed for research and education.

Conclusion

As discussed, the importance of MRI has taken prevalence over surgical biopsies when diagnosing DIPG, without biopsy tissue samples finding the primary etiology is not obtainable without causing serious risk or harm to the patients. It can be inferred that one can be diagnosed with DIPG from primary symptoms and correct protocol for medical imaging.⁸ Diagnosis of DIPG is related to poor survival rates and has no history of showing in effective therapeutic treatment.

References:

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