

Current Clinical Management of Children Diagnosed with Diffuse Intrinsic Pontine Glioma (DIPG)

**Kenneth J. Cohen, MD, MBA
Director, Pediatric Neuro-Oncology
The Sidney Kimmel Comprehensive
Cancer Center at Johns Hopkins**

What are we talking about?



Diffuse Intrinsic Pontine Glioma

The patient is an 8-year-old male who presented to an ophthalmologist after complaints of **diplopia** for approximately 2 weeks. He was noted to have mild **papilledema**. He had also been noticed by his parents to be having some **slurred speech** during the prior 2-3 days.



Diffuse Intrinsic Pontine Glioma

Synonyms: “Brain stem glioma”

% of cases: 5-10% (~ 200 cases/year in US)

Age range: 8 years (median)

Diagnostic Eval: MRI only if classic lesion

Role of Surgery: None (discouraged)

Prognosis: Almost all patients die between 6 mos. and two years from diagnosis



Brain Tumor Nomenclature: WHO Classification

Tumors of Neuroepithelial Tissue

Tumors of Peripheral Nerves

Tumors of the Meninges

Lymphomas and Haemopoietic Neoplasms

Germ Cell Tumors

Tumors of the Sellar Region

Metastatic Tumors

WHO Classification: Tumours of Neuroepithelial Tissue

Astrocytic tumours

Oligodendroglial tumours

Mixed gliomas

Ependymal tumours

Choroid plexus tumours

Glial tumours of uncertain origin

Neuronal and mixed neuronal-glial tumours

Neuroblastic tumours

Embryonal tumours

Pineal parenchymal tumours

Astrocytic Tumors: Classification

Low Grade Astrocytoma

Pilocytic Astrocytoma (WHO 1)

Fibrillary Astrocytoma

Low-Grade Fibrillary (WHO 2)

High Grade Astrocytoma

Fibrillary Astrocytoma

Anaplastic Astrocytoma (AA) (WHO 3)

Glioblastoma Multiforme (GBM) (WHO 4)



DIPG: Classification

Low Grade Astrocytoma

Pilocytic Astrocytoma (WHO 1)

Fibrillary Astrocytoma

Low-Grade Fibrillary (WHO 2)

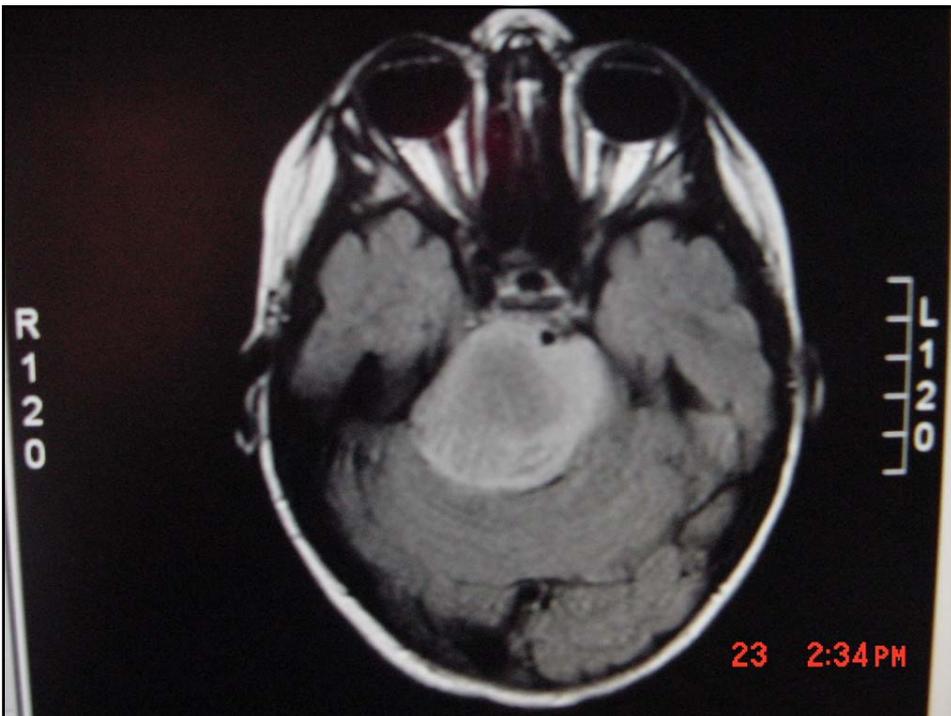
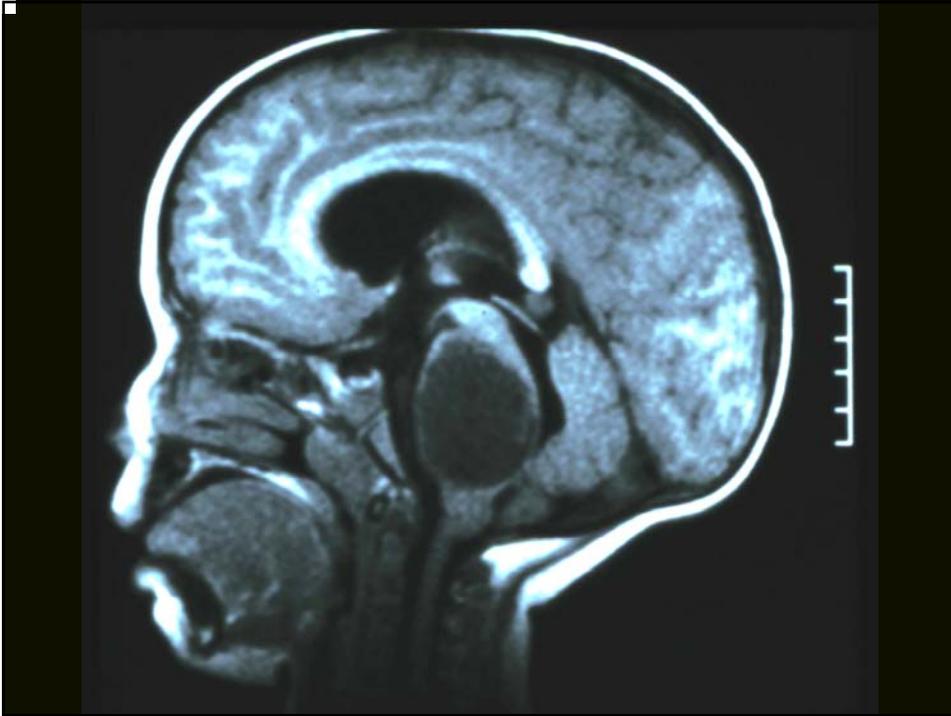
High Grade Astrocytoma

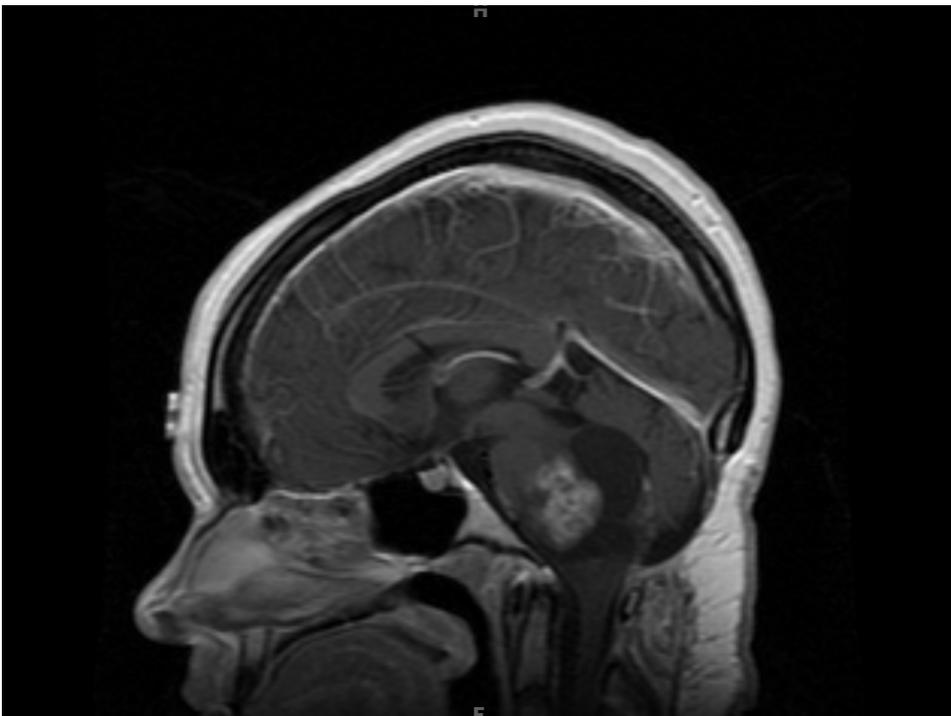
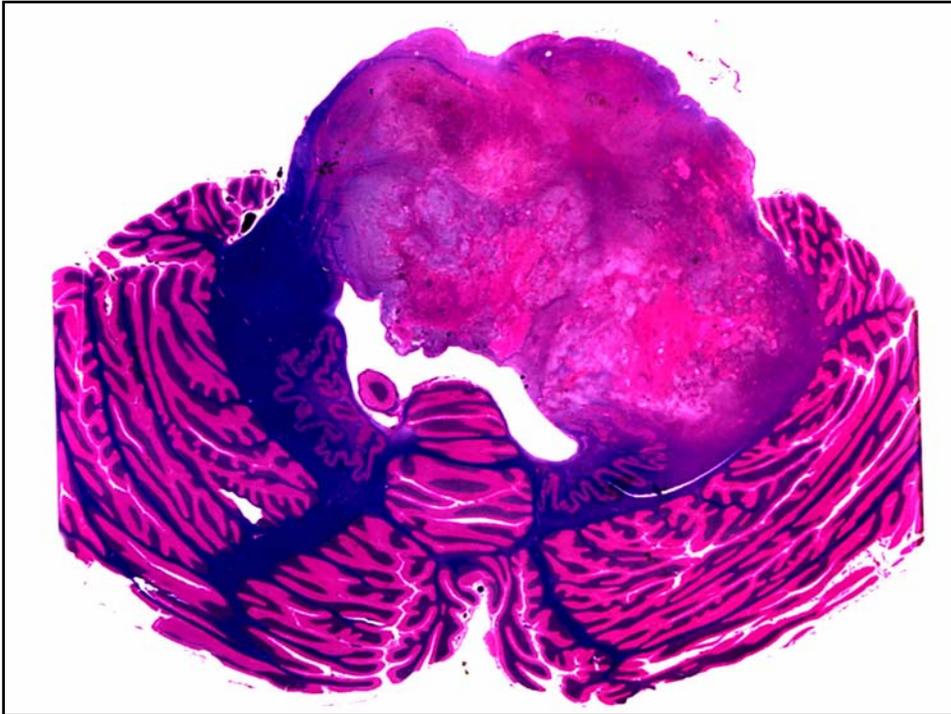
Fibrillary Astrocytoma (cont'd)

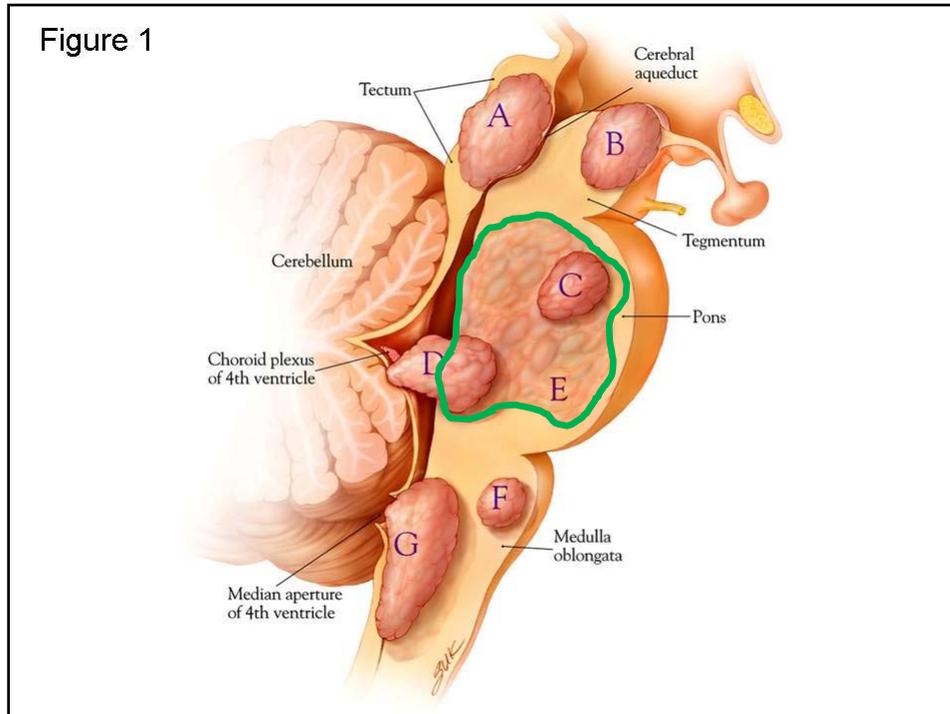
Anaplastic Astrocytoma (AA) (WHO 3)

Glioblastoma Multiforme (GBM) (WHO 4)









DIPG: “Natural” History

- Diagnosis generally after a few months of findings that may include:
 - Cranial neuropathies
 - Long-tract signs
 - Ataxia
 - Obstructive hydrocephalus
- Often fairly intact
- The “Discussion” at diagnosis re: prognosis

DIPG: “Natural History”

- Steroids initiated with short-term improvement in symptoms
- Focal radiation therapy
- General improvement following XRT with “honeymoon” period (off steroids, improved or stable neurologic findings) for 3 – 9 months following XRT
- Re-emergence of neurologic findings
- Progression → Death



DIPG: Treatment

Standard of-care:
Focal XRT



DIPG: Treatment What's been tried

Focal XRT

↑

Neoadjuvant
Hyperfractionated XRT

"Honeymoon Period"

↑

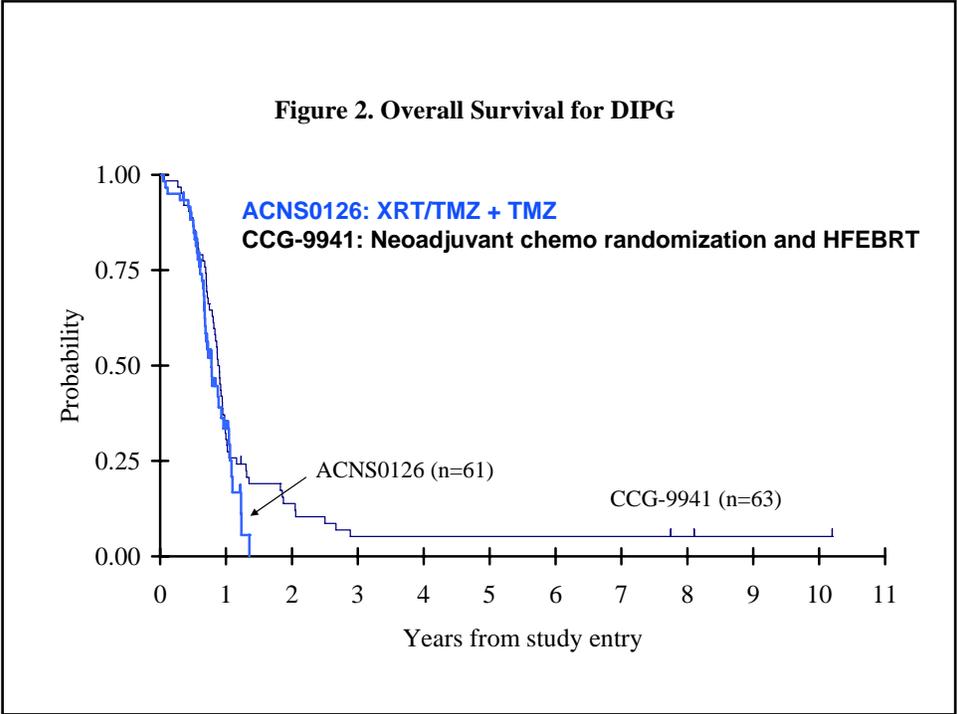
Adjuvant chemo
Autotransplant

Progression

↑

Phase 1 Therapy

THE SIDNEY KIMMEL
COMPREHENSIVE CANCER CENTER
AT JOHNS HOPKINS

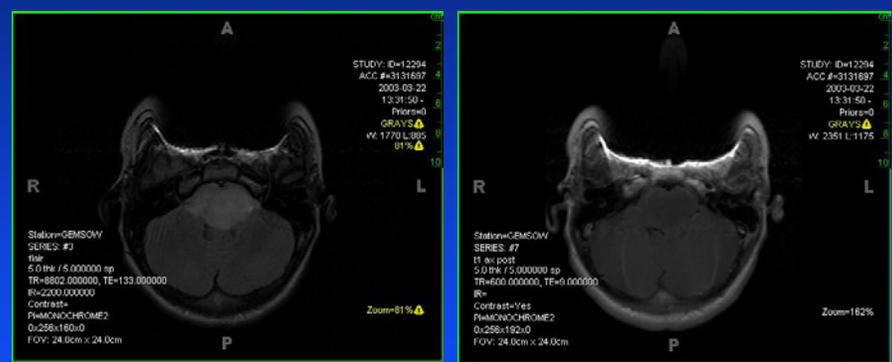


Evidence for the proven role of anything except XRT for DIPG

Novel strategies need to be explored



Is anyone cured?



15 yo at initial diagnosis. Treated with
XRT/EGFR inhibitor. Now 6 years from initial
diagnosis. Correct diagnosis?



DIPG: Terminal Management

- **Eventual inability to retain control of tumor**
- **Worsening neurologic function**
- **Severe steroid morbidity**
- **? of placing shunt in some cases for limited gain**
- **Palliation -> Coma -> Death**

