CHILDHOOD CANCER AWARENESS CAMPAIGN
"12 Mahine: 12 Posters"

Pediatric Hematology and Oncology Chapter
Indian Academy of Pediatrics

UNMASKING PEDIATRIC BRAIN TUMORS: AWARENESS IS KEY

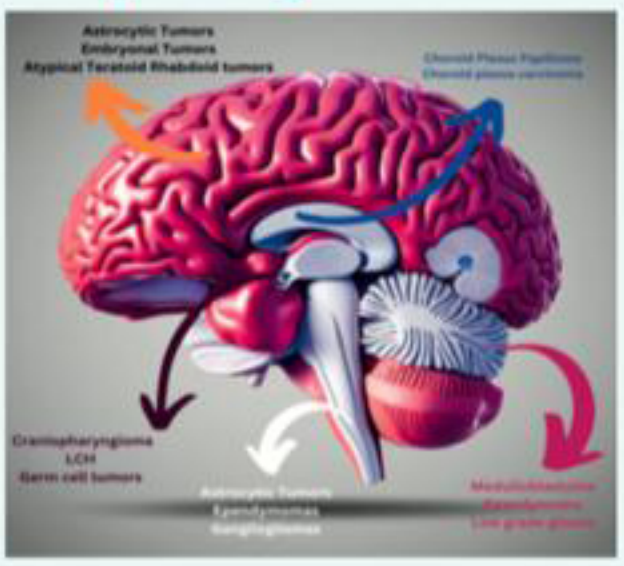
Fact File

- Brain tumors are the most common type of solid tumor in children
- Second to leukemia as a cause of childhood malignancies
- Estimated incidence in India - 12,900 cases/year
- Leading cause of childhood cancer-related deaths
- Prognosis depends on the age at presentation, histological type, and extent of resection

Red Flag Signs - Indication to do Neuro Imaging

- Acute onset Seizures
- Recent onset Visual disturbances
- New onset Squint
- Vertigo
- Persisting Irritability
- Early morning recurrent Vomiting
- Acute onset Cranial nerve palsy
- Torticollis
- Gait Disturbances
- Persisting Headache
- Unexplained Personality Change
- Precocious puberty
- Failure to thrive
- Increasing head size

Differential diagnosis depending on location



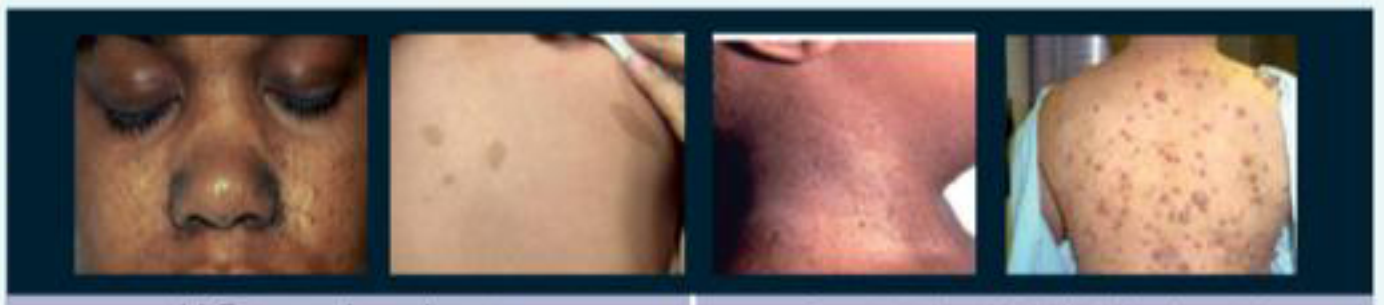
Differential diagnosis depending on age

Infants & Toddlers	▪ Teratoma ▪ Medulloblastoma ▪ Embryonal tumors ▪ Rhabdoid tumor ▪ Low grade glioma ▪ Choroid plexus papilloma
Young children (<10 y)	▪ Pilocytic astrocytoma ▪ Medulloblastoma ▪ Ependymoma ▪ Germ cell tumors ▪ Craniopharyngiomas
Older children & teenagers	▪ Germ cell tumors ▪ Embryonal tumors ▪ Ependymomas ▪ High-grade glioma ▪ Pineoblastoma ▪ Meningioma

Initial investigations: an outline

Investigation	Purpose/Rationale
Ultrasound head	Accessible and useful in infants
CT Brain	Quickest and most readily available modality Can pick up haemorrhage, hydrocephalus and calcifications
MRI of Brain with Spine	Preferable modality of choice prior to definitive surgery or biopsy
Serum electrolytes	Associated diabetes insipidus or SIADH
Serum AFP & β-HCG	Diagnostic tumor markers for intracranial Germ cell tumors can possibly avoid biopsy/ surgery if elevated

Genetic syndromes associated with brain tumors



Li-Fraumeni syndrome	Constitutional (biallelic) mismatch repair deficiency syndrome (CMMRD)
Lynch syndrome	
Rhabdoid tumor predisposition syndrome	DICER1 syndrome
Gorlin syndrome	Neurofibromatosis type 1 and type 2
Von Hippel-Lindau syndrome	Tuberous sclerosis

Common 4 tumors encountered

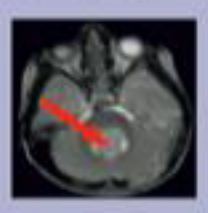
LOW GRADE GLIOMA

- Most common brain tumor in children
- Can be associated with NF-1
- Biopsy can be avoided in optic pathway glioma

- If resectable, complete resection if sufficient
- Chemotherapy in younger children
- Radiotherapy in older children- Avoid if possible in younger children

MEDULLOBLASTOMA

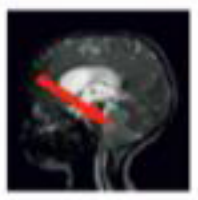
- Second most common brain tumor
- Arises from posterior fossa
- Gait disturbances and signs of raised ICP



- Surgery followed by adjuvant radiotherapy and chemotherapy
- In those younger than 3 years, radiation sparing chemotherapy can be considered

EPENDYMOMA

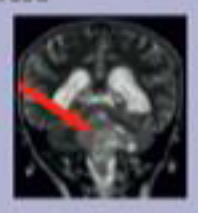
- Can arise from either supratentorial, infratentorial or spinal cord
- Symptoms depends on site of tumor



- Surgery – Near total resection preferred
- Radiation in certain grades of ependymoma
- Role of chemotherapy is limited

HIGH GRADE GLIOMA

- Can arise from any location
- Associated with mismatch repair deficiency if presents early in life
- Prognosis is generally guarded

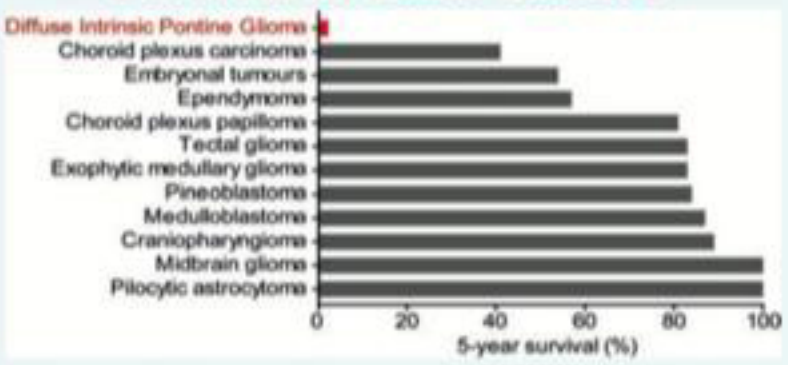


- Surgery – Near total resection preferred
- Adjuvant therapy with focal radiation and temozolamide
- Immunotherapy in children with mismatch repair deficiency

Treatment principles

Surgery	Biopsy | Hydrocephalus treatment – Shunt / Omaya | Debulking or definitive surgery | Least morbid surgery with maximal safe resection
Radiotherapy	Definitive treatment in >3 years
Chemotherapy	Least toxic regimen | Targeted therapy in low grade glioma | Concurrent chemoradiotherapy in high grade glioma

Survival in brain tumors



Survival for most brain tumors have improved over the past decade due to early diagnosis, better understanding of disease biology and improvement in treatment protocols