BRAIN TUMORS

TUMOER	DESCRIPTION	MACROSCOPIC:	MICROSCOPIC
ASTROCYTOMA/IDH-mutant	Diffuse >>Grade 2-4, adults, cerebrum, Progressive IDH1 or IDH2 , **Inactivating TP53 and/or ATRX**	Grade 2&3:: Infiltration Grade 4: lacks large areas of central necrosis and hemorrhage	grade 2:: Hypercellular “GFAP positive” , hyperchromatic nuclei, fibrillary **NO: necrosis, mitosis, microvascular proliferation** P53 positive, , ATRX negative Anaplastic 3: **mitotic** figures are present grade 4: Microvascular proliferation and/or necrosis , mitotic .homozygous deletion of CDKN2A &/or CDKN2B one sign is enough
Glioblastomas, IDH-wild-type, ***grade 4***	**H3** wildtype and **one** or more of the **Molecular features** most common malignant glioma in **adults**)., cerebral hemispheres**, ring enhancing lesion, (butterfly glioma)** **survival: 1- 1.5 year**	glioblastoma multiforme = variation necrosis cystic degeneration	Brisk mitotic activity and **palisading** **Necrosis**: or microvascular proliferation:**2 > layers** **Molecular features: designation : (TERT promotor, EGFR gene, +7/-10 chromosome copy number changes**

ATRX mutation is not with TERT gene (1p/19q codeletion) mutation

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OLIGODENDROGLIOMA, IDH - MUTANT, & **1P/19Q - CODELETED**	diffusely infiltrating, **IDH1 or IDH2 mutation with codeletion of chromosomal arms 1p and 19q.** , adults, cerebral hemispheres(frontal or temporal) survival : grade 2.=10-20, best prognosis among diffuse glial tumors **NO grade 1 OR 4**	cysts, **calcification.**	regular uniform cells resembling oligodendrocytes granular chromatin (salt and pepper) fried-egg appearance. “chicken-wire” –like **anastomosing** capillaries mitosis = absent o**r low (Ki67<5%)** **NO**: necrosis , microvascular proliferation **grade 3:: pathological microvascular proliferation and/or brisk mitotic activity with or without necrosis or CDKN2A deletion**
Pilocytic Astrocytoma,	benign>> grade 1>> **complete resection ,** children, cerebellum mainly, Cerebral hemispheres: adults + ICP , hydrocephalus, **not have** mutations in IDH1 and IDH2, **BRAF >>>MAPK**	cysts with neural nodule	**bipolar cells** **GFAP positive “hairlike”** **non specific :** • **Rosenthal fibers= corkscrew shaped** • **Eosinophilic granular bodies “EGBs” :** **hyaline droplets**
EPENDYMOMA,WHO 2&3	10 groups, glioma, posterior fossa: 4th ventricle, pediatric, supratentorial, Spinal: adults, completely resected	glioblastoma multiforme = variation necrosis cystic degeneration	**grade 2**: uniform small cells, No necrosis or MVP, low mitotic count , **Rosette formation**: • ***Ependymal rosettes:*** diagnostic, around central canal or lumen “embryologic” • ***perivascular pseudorosettes:*** not specific, around vessels, native, non-neoplastic element. Anaplastic **grade 3**: less **ependymal** differentiation, brisk mitotic rates, **MVP**

NEURONAL TUMORS

TUMOER	DESCRIPTION	MACROSCOPIC:	MICROSCOPIC
Gangliogliomas, WHO grade 1:	children, Slow growing, neoplastic ganglion and glial cells, temporal lobe., **BRAF gene**	-	-
Dysembryoplastic neuroepithelial tumor (DNT), WHO grade 1:	**Rare, children, Slow growing, seizure, superficial temporal lobe.**	glioblastoma multiforme = variation necrosis cystic degeneration	-
Embryonal (Primitive) Neoplasms - **Medulloblastoma**	**undifferentiated** cell, resembling normal progenitor cells, children, grade 4, radiosensitive., cerebellum>>cerebellar surface, **dismal, 75% 5-year survival**	children (midline) adults (lateral) circumscribed **Dissemination** through the CSF Very Cellular, **("small blue")** **crescent-shaped, synaptophysin marker,**	***Homer Wright Rosettes:*** primitive small blue cells with central neuropil **Wnt** pathway: gain . **β**-catenin ,**favorable** prognosis **MYC** amplification , *poorest* prognosis ***Hedgehog*: gain fx , (-) PTCH1 , intermediate prognosis, P53 mutation, poor prognosis**

TUMOER	DESCRIPTION	MACROSCOPIC:	MICROSCOPIC
Meningiomas ,WHO grades 1-3	adults F>M , external surfaces of the brain, spinal cord, within the ventricular system, **Prognosis**:size and location, surgical accessibility, histologic grade. **progesterone** receptors, loss of chromosome **22**, NF2 gene **deletions** **NF2:** Multiple meningiomas + **8th** nerve schwannoma	rubbery, rounded, separable or infiltrative grade 1: **Epithelioid** cells>>(**syncytial**)pattern , histologic subtype, with **no prognostic** difference, **grade 2**: 4 to 19 mitoses/10, (3 out of 5):cellularity, small cells with a high N/C ratio, prominent nucleoli, patternless growth, or necrosis **clear cell or chordoid subtypes, unequivocal brain invasion** **grade 3:** **1. >20 mitoses/ 10HPF; or** **2. Frank anaplasia (sarcoma, carcinoma or melanoma like); or** **3. TERT promotor mutation; or** **4. Homozygous deletion of CDKN2A/B** **5. Papillary; or rhabdoid meningioma.**	-

Metastatic Tumors:

carcinomas ,sharply demarcated masses ,at the grey-white matter junction, from lung, breast, skin (melanoma),
kidney, and colon,

Primary Central Nervous System Lymphoma:

in immunosuppressed individuals, poor response to chemotherapy, diffuse large B-cell lymphomas, well defined Multifocal rarely outside of the CNS