

Glioblastoma

Presenting Sx: Headache, MS change, speech difficulty, neuro def

DDx: Infection, Metabolic, vascular, metastasis, lymphoma, glioma

JPA, ATRT

WHO Criteria

Mitosis

Endothelial Proliferation

Atypia

Necrosis

Glioblastoma requires 3

OR pseudopalisading necrosis

Molecular

MGMT methylated - improved outcome due to decreased repair

IDH - improved outcomes

ATRX - related to secondary glioblastomas

Surgery: Maximum safe resection. Post-op imaging within 72 hrs

Chemo: TMZ @ 75 mg/m^2 daily w/ RT \rightarrow 1 month break \rightarrow

50-200 mg/m^2 for 5 days/month for 6-12 months. Major side effects include thrombocytopenia + neutropenia. Requires ppx vs

PEP w/ TMP/SMZ (Bactrim) or pentamidine

RT: 60 Gy in 30 fx, 40 Gy/15fx, 34 Gy/10fx, 5 Gy/5fx

Volumes

GTV: Post-op cavity + contrast enhancement

CTV: GTV + 2 cm (can expand to include FLAIR) (46 or 60 Gy)

Can also consider 1 cm for boost (60 Gy)

PTV: CTV + 3 mm

Constraints

Brainstem < 54 Gy (May go up to 60)

Chiasm + Nerve < 54 Gy

Cochlea < 54 Gy Mean < 30-45

Spinal Cord < 45-50 Gy

Brain V30 < 50%

Hippocampus < 16 Gy Mean < 9 Gy

Lens < 5-7 Gy

Literature

Stupp/EORTC/NCIC: RT vs. RT + conc + adj. TMZ
Improved OS w/ RT + TMZ. On subsequent analysis, benefit larger w/ MGMT methylation

Canadian Hypofrac (Rea): 60 Gy/30 fx vs 40 Gy/15 fx
No TMZ. Hypofrac non-inferior. ≥ 60 yrs + KPS ≥ 50

IAEA (Rea): 25 Gy/5 fx vs 40 Gy/15 fx
No TMZ. 5 fx non-inferior. ≥ 65 yrs KPS ≥ 50 , ≥ 50 yrs KPS 50-70

Nordic (Maelstrom): 60 Gy/30 fx vs 34 Gy/10 fx vs TMZ
TMZ or 34 Gy non-inferior. Better OS with hypofrac + TMZ in ≥ 70 yrs. Included ≥ 60 yrs.

French (Keime-Guibert): 50 Gy/28 fx vs supportive care
OS improved w/ RT. ≥ 70 yrs + KPS ≥ 70

EORTC/CELTG/TRDG: 40 Gy/15 fx vs 40 Gy/15 fx + TMZ
OS + PFS improved w/ TMZ. ≥ 65 yrs

RTDG 9305: SRS \rightarrow RT + Carmustine vs RT + Carmustine
No improvement in outcome w/ SRS

CeTeG/NOA-09: 60 Gy + conc + adj. TMZ vs 60 Gy + TMZ + Lomustine in MGMT methylated. Improved OS but not PFS by ITT

EFK (Furp): Maintenance TTF + TMZ vs TMZ
Improves PFS + OS w/ TTF. Must wear at least 50%.