Natural History of Incidentally Discovered Diffusely Infiltrating Glioma

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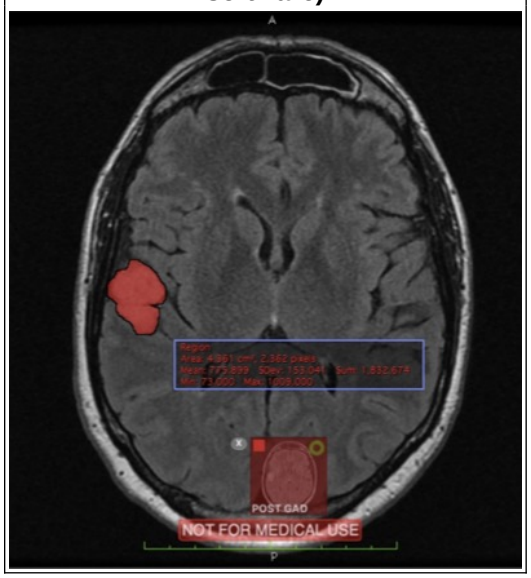
BACKGROUND

- While patients with LGG may present with seizures or other neurological deficits, a significant proportion are identified incidentally
- Symptomatic LGGs grow at a velocity of 4mm/year and are usually managed expectantly with serial neuroimaging
- There is growing interest in incidentally discovered diffusely infiltrating glioma (IDIG) as they present a challenge on the optimal timing for intervention

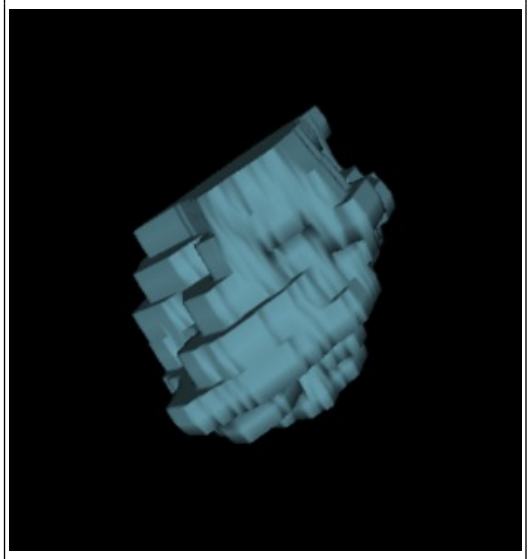
OBJECTIVES

- What is the *natural history* of iDIGs?
- Do the molecular genetics of surgically resected iDIGs correlate with *growth velocity*?

Compute tumor volume (OsiriX software)



Tumor volume



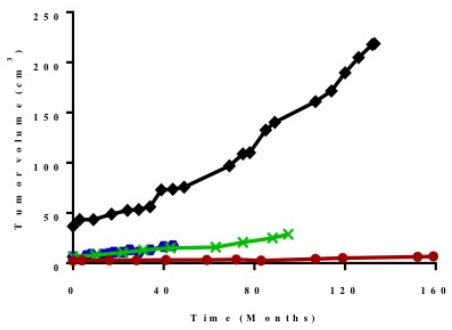
Mean tumor diameter = (2V)1/3

METHODS

The records of *24 patients* with iDIGs at the Foothills Medial Center, Calgary, AB, Canada were reviewed.

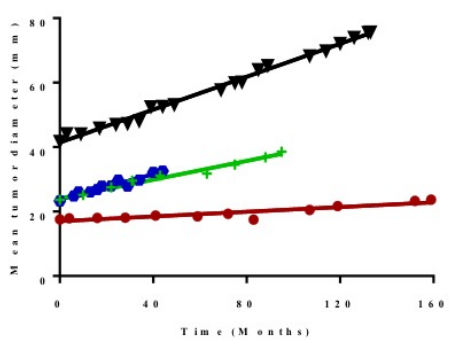
OsiriX® software was used to compute tumor volumes from FLAIR/T2 MRI sequences performed from the time of diagnosis until surgery. Mean tumor diameter (MTD) was calculated by the formula (2 x V)1/3. Volume of diametric expansion (VDE) was then imputed from plotting the MTD over time. Correlation between VDE and glioma molecular markers was assessed. A survival was evaluated using Kaplan-Meier and categorized by VDE rate (0-2.5mm/yr or 2.5-8mm/yr).

Tumor growth



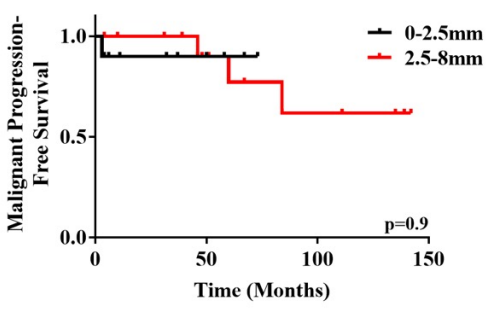
Tumor volume in 4 patients

Tumor growth



Mean tumor diameter in 4 patients

Malignant transformation



RESULTS

24 patients in the study (50% male, mean age of 42.5, mortality rate of 12.5%, follow-up 50 months)

Median volume of diametric expansion (VDE) : 2.41 mm/year

Eighty-three percent (20/24) had IDH mutation on genetic analysis.

- IDH-mutation was the only statistically significant (p=0.009) parameter that predicted a relatively increased VDE. The median overall survival was not affected by VDE rate.

CONCLUSIONS

Our study findings demonstrate iLGGs are not quiescent although patients may remain asymptomatic and grow at a median rate of 2.41mm/year. Although VDE rate was associated with IDH mutation, a correlation cannot be established in this study due to small sample size and limitation of the study design. The study also did not show effect of VDE rate on overall survival.