Survival Outcomes for Watchful-Waiting vs. Surgical Resection for 1p/19q-codeleted WHO Grade 2 Diffuse Oligodendrogliomas

Maya Harary BA; J. Bryan Iorgulescu MD; Timothy R. Smith MD PhD MPH

Computational Neuroscience Outcomes Center, Dept of Neurosurgery, Brigham and Women's Hospital

Dept of Pathology, Brigham and Women's Hospital

BWH

Introduction

- 1p/19q-codeleted, World Health Organization (WHO) grade 2 diffuse oligodendrogliomas represents a favorable subset of the grouping previously referred to as low grade glioma
- The role of maximal tumor resection in this specific tumor type remains unresolved, with early retrospective series limited by the rarity of these tumors, lack of molecular classification, and substandard assessments of extent of resection.[1,2]

Methods

- The National Cancer Database was surveyed to identify patients >20yo who presented with biopsy-proven 1p/19q-codeleted WHO grade 2 diffuse oligodendrogliomas during 2010-2015
- Characteristics, management, and overall survival (OS) were evaluated between patients undergoing biopsy only vs. tumor resection
- Patients were stratified based on whether they were managed with watchful-waiting (biopsy-only cohort) or underwent surgical resection within 3-months of diagnosis (substratified to subtotal resection (STR) vs. gross-total resection (GTR))
- Patients receiving chemotherapy or radiotherapy were excluded to prevent confounding
- Dichotomous variables were compared by multivariable logistic regression
- OS was estimated by Kaplan-Meier methods and compared by log-rank test and risk-adjusted proportional hazards

Results

- There were 473 patients with biopsy-proven 1p/19q-codeleted WHO grade 2 diffuse oligodendrogliomas who did not receive adjuvant therapy, of which 84.6% (n=400) underwent surgical resection

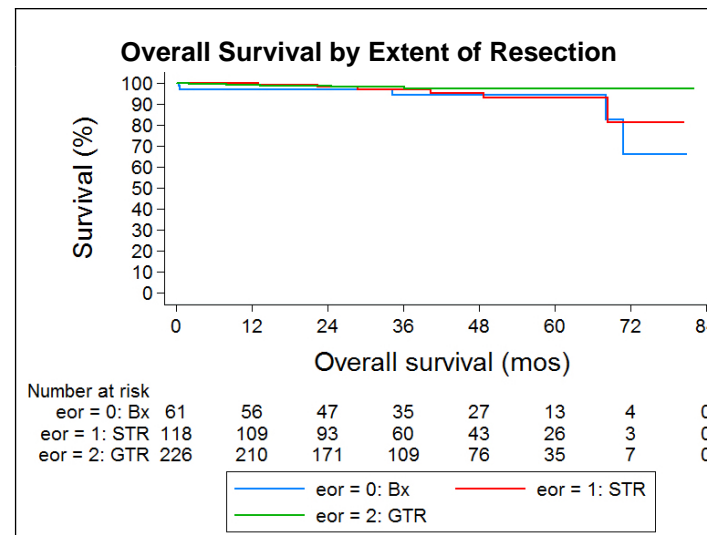## Results

Likelihood of resection:

- Younger patients were more likely to be resected (50-59yo vs. <40yo OR 0.3, 95%CI 0.1-0.7, p=0.004)
- On univariate analyses, resection was independent of patient sex, comorbidities, race/ethnicity, insurance status, tumor location, or tumor size (all p>0.05)

Extent of resection (EOR)

- Of those that were resected, 46.0% (n=261) had GTR
- On risk-unadjusted analysis larger tumors (STR 4cm (IQR 3-5) vs. GTR 4cm (IQR4-6), p=0.003) and tumors not crossing midline (STR 88.5% vs. GTR 94.6%, p=0.03) were associated with GTR
- Only insurance status (private vs. uninsured OR 2.8, 95%CI 1.1-7.2, p=0.03) was associated with GTR on risk-adjusted analysis

Overall survival (OS)

- In risk-adjusted analyses, GTR (vs. biopsy only: HR 0.1, 95%CI 0.01-0.6, p=0.02), but not subtotal resection (STR vs. biopsy-only HR 0.2, 95%CI 0.03-1.9, p=0.17), demonstrated improved OS
- Other independent predictors of improved OS were private insurance (vs. uninsured, OR 0.03, 95%CI 0-0.5, p=0.01) and fewer comorbidities (Charlson/Deyo Comorbidity Index 2 vs 0, OR 32.3, 95%CI 1.5-701.0, p=0.03)
- Unadjusted 5-yr OS rates were:
    - Biopsy-only: 94.0% (95CI: 82.1-98.1)
    - STR: 92.7% (95CI: 82.2-97.1)
    - GTR: 97.1% (95CI: 93.0-98.9)

Overall Survival by Extent of Resection

Number at risk

eor = 0: Bx	61	56	47	35	27	13	4	0
eor = 1: STR	118	109	93	60	43	26	3	0
eor = 2: GTR	226	210	171	109	76	35	7	0

eor = 0: Bx — eor = 1: STR — eor = 2: GTR

Conclusions

- WHO grade 2 1p/19q-codeleted diffuse oligodendrogliomas that are amenable to resection demonstrate improved OS with GTR in a national cohort, as compared to biopsy-only watchful waiting

References

(1) Central Nervous System Cancers (Version 1.2017). National Comprehensive Cancer Network. https://www.nccn.org/professionals/physician_gls/pdf/cns.pdf.
(2) van den Bent MJ, Smits M, Kros JM, Chang SM. Diffuse Infiltrating Oligodendroglioma and Astrocytoma. J Clin Oncol. 2017;35(21):2394-2401. doi:10.1200/JCO.2017.72.6737

Learning Objectives

- What are the patient and tumor characteristics predictors of management by watchful waiting vs. surgical resection in 1p/19q-codeleted WHO grade 2 diffuse oligodendrogliomas?
- What are the patient and tumor characteristics associated with EOR in 1p/19q-codeleted WHO grade 2 diffuse oligodendrogliomas?
- What are the overall survival benefits associated with extent of resection in 1p/19q-codeleted WHO grade 2 diffuse oligodendrogliomas?