

Pathologically Verified Malignant Progression of Low-Grade Glioma: Clinical Predictors of Malignant Progression Free Survival

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Introduction

Low grade gliomas (LGGs) are slow-growing primary brain tumors with variable overall survival and time to malignant progression. The goal of our study is to describe their natural history and assess for clinical predictors of malignant progression.

Methods

All cases of pathologically confirmed LGG (WHO 2) that progressed to WHO 3 or 4 were censored from 1995-2015. Clinical and pathological characteristics were collected. Univariate and multivariate analysis was performed for predictors of malignant progression free survival (MPS).

Results

: Fifty-five cases were identified. The median age at presentation was 35 years. The most common presenting symptom was seizure (N=37, 67%). Tumors typically did not enhance at presentation (N=46, 84%). The most common locations included tumors centered in the frontal lobe (N=17, 31%). Gross total resection was achieved in 31/112 cases (28%). Fifty-one patients received radiation therapy with 16 patients undergoing retreatment with radiation after a median time of 60 months. The median overall survival was 89 months, malignant progression 60 months, and progression free survival 41 months. The second progression occurred in significantly less time than the first (24 v 48 months, P=0.0145). Fifteen (27%) cases did not have malignant progression at the first progression. Astrocytic tumors were more likely to progress to grade 4 compared with oligodendroglioma (P=0.003). Age (P=0.001) and extent of resection (P=0.035) were significant predictors of overall survival on univariate analysis. Age (P=0.005) and re-treatment with radiation (P=0.008) were significant predictors of overall survival on multivariate analysis. Age, radiation treatment and re-treatment with radiation were all significant predictors of malignant progression free survival on multivariate analysis.

Conclusions

This is the largest series of pathologically proven cases of malignant progression of low-grade glioma. We identified age and radiation treatment as factors potentially predictive of malignant progression. Further the pattern of progression may differ by histology.

Learning Objectives

1. Describe the characteristics of malignant progression of low grade glioma.
2. Identify the factors associated with malignant progression
3. Understand factors that may affect patterns of malignant progression

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