The Effect of Postoperative Infection on Overall Survival in Glioblastoma Multiforme

Poster number: 2734 Category: tumor
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Disclosures

• None
Introduction

• Several retrospective case series have been performed that have investigated the survival advantage of postoperative infection in patients with glioblastoma, with controversial results. We report our institutional experience of post-operative infection in patients with glioblastoma.
Methods

- The charts of 208 patients with pathology confirmed GBM were retrospectively reviewed. Age, Karnofsky Performance Score at presentation, tumor burden, extent of resection, post-operative infection status, use of adjuvant chemotherapy/radiation, and date of death were recorded. Patients with secondary glioblastoma, biopsy only, or incomplete survival records were excluded from the study. 116 patients met inclusion and exclusion criteria. 11 post-operative infections were identified, and these patients were age-matched to 3 patients without post-operative infection for comparative analysis. A sub-group analysis was performed comparing 6 patients with infection within the first quarter of their overall survival to age-matched patients.
Results

• Mean age of the 44 patients included in analysis was 51.32 (SD=11.66). Overall survival was 68.2% at one year, 13.26% at five years, and 7.95% at ten years.

• 6 patients in the post-operative infection group had infections in the first quarter of their survival (time to death/survival ratio >75%), while 10 of the 11 patients had infections within the first half of their survival (infection to death/ survival ratio >50%).

• Overall survival for the post-operative infection group was 81.8% at one year, 36.4% at five years, and 27.3% at ten years. Overall survival for the no post-operative infection group was 63.6% at one year, 6.1% at five years, and 0% at ten years. Kaplan-Meier survival analysis showed the difference in overall survival was significantly different ($p=0.0054$).
Results

- Median survival was 33.32 months in the postoperative infection group (IQR=18.77-77.27) compared to 15.65 months in patients without postoperative infection (IQR=5.61-22.74) ($p=0.017$)

Figure 1. Kaplan-Meier survival curve for cases vs age-matched controls. Log-rank $p=0.0054$
Results

- Multivariable proportional hazards model showed that post-operative infection maintained its significant association with survival ($p=0.0045$).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Hazard Ratio</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-operative infection</td>
<td>0.272</td>
<td>0.111</td>
<td>0.667</td>
</tr>
<tr>
<td>Age</td>
<td>1.021</td>
<td>0.989</td>
<td>1.054</td>
</tr>
<tr>
<td>Tumor burden</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>KPS &lt; 80% at diagnosis</td>
<td>0.970</td>
<td>0.944</td>
<td>0.996</td>
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<tr>
<td>Subtotal resection</td>
<td>1.505</td>
<td>0.730</td>
<td>3.102</td>
</tr>
</tbody>
</table>
Results- Subgroup Analysis

- 24 patients with mean age of 48.67 (SD= 11.88).
- Kaplan-Meier survival analysis showed that the increase in overall survival remained significantly significant with the early post-operative infection sub-group compared to age-matched controls ($p= 0.0218$).
- Multivariable proportional hazards model for survival showed that early post-operative infection maintained its significant association with survival with a hazard ratio of 0.136 ($p=0.0238$).

Figure 2. Kaplan-Meier survival curve for patients with early post-operative infection vs age-matched controls.
Discussion

• Significant increase in overall survival in patients who had an infection any time between first resection and death compared to those patients who did not have infection.

• Three previous retrospective studies have investigated this issue. Our results are in agreement with Pasquale de Bonis et al. (2011) but contrasts to Bohman et al. (2009) and Chen et al. (2017).
Summary Points

• Significant survival advantage in patients who had an infection any time between first resection and death compared to those patients who did not have infection.

• The increase in overall survival remained statistically significant in early post-operative infection sub-group.

• Multicentric studies with larger sample sizes are needed to further investigate this topic and whether variabilities in infection have an effect on overall survival.