Background

- The incidence of esophageal cancer in the United States has continued to rise over the past three decades. Patients often present with advanced stage disease and only 16% of patients are alive at five years.
- Despite these grim statistics, the introduction of neoadjuvant therapy has facilitated significant progress in terms of overall survival in patients with esophageal cancer. However, there is not complete consensus on which group of patients most benefits from neoadjuvant therapy.
- Because previous work has shown that tumor length is a determinant of overall survival in patients with esophageal cancer, we chose to determine its prognostic value among our patients to help determine whether tumor length added any outcome-related benefit to that of traditional staging.

Methods

- 356 patients met inclusion criteria and were included for analysis.
- Multivariate Cox proportional hazards regression models were used to assess the correlation between tumor length as a continuous variable and mortality.
- Patients were then stratified within each stage to those with tumors ≤3 cm and > 3 cm to determine whether this length served as a threshold for worse overall survival. Stratified Kaplan-Meier curves were generated to examine survival by tumor length within each stage.

Results

Table 2: Overall and in-stage hazard ratios assessing the correlation between tumor length and mortality

<table>
<thead>
<tr>
<th>Tumor Length and Stage</th>
<th>Adjusted hazard ratio for each additional cm of tumor involvement</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients of all stages</td>
<td>1.13 (1.05-1.20)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Stage I patients</td>
<td>1.20 (1.05-1.37)</td>
<td>0.009</td>
</tr>
<tr>
<td>Stage II patients</td>
<td>1.14 (0.99-1.31)</td>
<td>0.070</td>
</tr>
<tr>
<td>Stage III patients</td>
<td>1.09 (0.99-1.20)</td>
<td>0.083</td>
</tr>
</tbody>
</table>

Comparison of HRs for Stage I vs. II vs. III

Overall, with patients of all stages included for analysis, tumor length impacts mortality with each increasing centimeter of involvement entailing a 13% increased risk of mortality (p<0.1).

Conclusions

- There was insufficient evidence to state that the association between tumor length and risk of mortality is modified by stage (p=0.582). Therefore, tumor length leads to increased mortality regardless of stage, but the trend is most prominent for stage I patients (p=0.009).
- Intra-stage patient stratification at 3 cm revealed that the HR for mortality associated with tumors > 3 cm did not reach statistical significance among our patient population. However, these findings suggest a trend towards significantly worse mortality for stage I patients with tumors > 3 cm.
- These findings are significant because the current AJCC staging system does not facilitate complete consensus on which group of patients most benefits from neoadjuvant therapy. These results may suggest that adding tumor length to current staging criteria to help direct prognostic and management decisions may be worth consideration.

References


Acknowledgments

A huge thank you goes out to Shilpen Patel, Danny Hibbard, Bryan Comstock, Aastha Bansal, Carlos Pellegrini, Veena Shankaran, and Steve White, as well as the other co-authors. Thank you in general to the radiation oncology department for supporting this research.