

The Role of Frailty in Assessing Head and Neck Cancer Mortality Inside and Outside the Operating Room

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BACKGROUND

- Frailty is described as a syndrome of **reduced physiologic reserve and decline of multiple physiologic systems**, associated with increased susceptibility to disability and diminished resistance to stressors.
- It is a multi-dimensional, multi-system impairment across **numerous physiologic domains**, including nutritional, status, energy, physical activity, mobility, and strength in addition to cognition, mood, and other aspects of mental health.
- The **Risk Analysis Index (RAI)**, based on the accumulation of deficits model of frailty, is one of the most **thoroughly tested and validated** frailty measurement tools for surgical populations.
- **Frailty in head and neck oncology** has been primarily studied in surgical populations and was generally found to be an **independent predictor of morbidity and mortality** in this surgical population.
- Implications of frailty in the growing population of **non-surgically treated** head and neck cancer (HNC) patients, however, has not been well-established.
- This study aims to assess the **predictive value of a frailty assessment tool on mortality** in HNC patients treated either with **non-surgical** or **surgical** modalities.

RESULTS

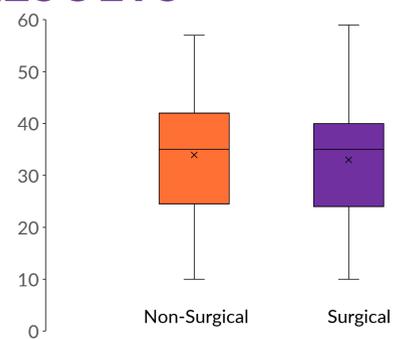


Figure 1. RAI Score by Cohort. There was no statistically significant difference in RAI scores between surgical (N=111, mean=33, range=10-59) cohorts and non-surgical (N=54, mean=34, range=10-57).

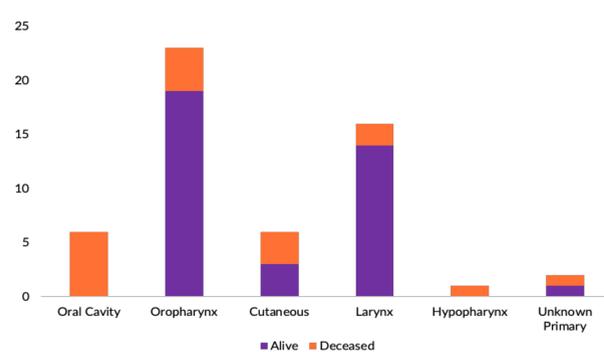


Figure 2. Non-surgical Cohort (N=54): Overall Mortality Rate by Subsite. Of 17 deaths recorded during the censorship period, 6 (35.3%) were attributed to oral cavity malignancy, accounting for all (100%) non-surgical patients with oral cavity malignancies.

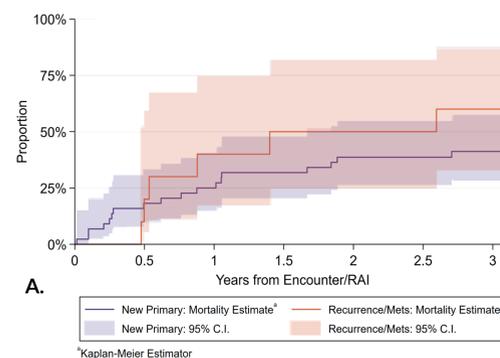


Figure 3. Non-Surgical Cohort (N=54): A) Mortality Estimate by Days of Encounter/RAI based on Disease Presentation. Subgroup analysis by disease presentation demonstrated 38% and 61% Kaplan-Meier estimates of all-cause mortality in new primary and recurrent/metastatic disease, respectively through to 5/31/2019. B) Mortality Estimate by Days of Encounter/RAI. There was a 45% overall Kaplan-Meier all-cause mortality estimate for patients treated with non-surgical modalities through to 5/31/2019. Deceased non-surgical patients had significantly higher frailty scores compared to those alive (mean RAI score: 40 vs. 31 respectively, $p=0.006$, 95% CI: 1-13). Each incremental increase in RAI score, among non-surgical patients, was associated with a 6.5% mortality-hazard increase (HR: 1.065, $p=0.006$, 95% CI: 1.018-1.113).

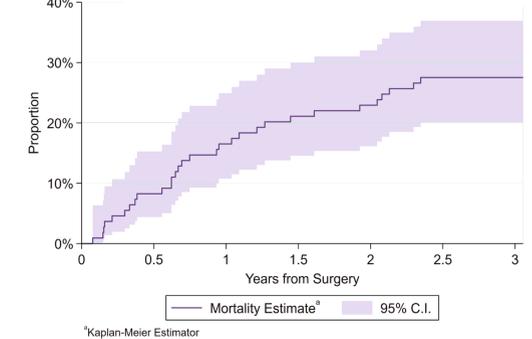
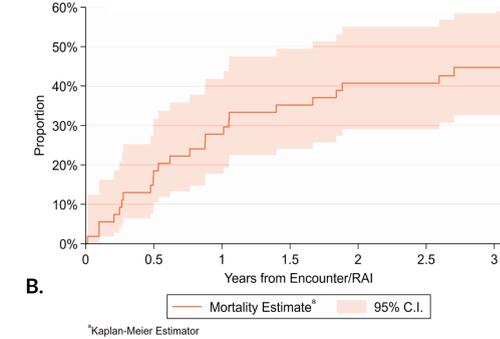


Figure 4. Surgical Cohort (N=111): Mortality Estimate by Days from Surgery. The Kaplan-Meier curve for post-operative all-cause mortality estimate was 28% among surgically treated patients through to 5/31/2019.

CONCLUSIONS

- **Understanding frailty** is critical for **shared decision-making** and avoiding low-value interventions.
- It is examined more commonly in **surgical** HNC.
- Non-surgical HNC patients have statistically **similar RAI scores** to surgical patients; and are thus at **similar risks for treatment-related morbidity and mortality**.
- This study highlights that frailty is significantly related to mortality in **non-surgical** HNC patients, and that it is important to understand these implications before initiating treatment.

MATERIALS AND METHODS

Single-site, Prospective QI Initiative from 2016-2019

20,514 RAI records containing 3,078 Surgery records

Inclusion Criteria: Age ≥ 18 years; New Patient Visit; Surgery within 90 days of RAI

224 Surgical Encounters
527 Non-surgical Encounters

Exclusion Criteria: Duplicate/Non-unique records; Non-"major" ENT procedure; Benign disease or pathology

111 Treated Surgically [83 male, 28 female; mean age 65 yrs (SD=12)]
54 Treated non-surgically [39 male, 15 female; mean age 68 yrs (SD=11)]

Study cohort of HNC patients