

Introduction

Primary treatment of head and neck squamous cell carcinomas (HNSCC) include surgical resection, radiation, chemotherapy, or a combination of these depending on the subsite and staging. However, recurrence after primary treatment occurs in up to 50% of cases and can lead to higher mortality rates. Salvage surgery is standard of care after recurrence of HNSCC, and several factors impact the success of salvage surgery including the extent of primary disease and recurrence, subsite, and prior treatment. Additionally, salvage surgery can have significant morbidity. There are currently no established guidelines for selecting patients who may benefit from salvage surgery after recurrence of HNSCC.

Previous studies have either focused on specific head and neck cancer subsites, quality of life outcomes, or clinical outcomes in salvage surgery. Few studies have looked at a combination of these three in a single cohort. Additionally, while validated quality of life surveys have been established in literature, only few quantitative measures to describe quality of life exist.

The objectives of this study were 1) to use validated surveys to characterize pre- and post-operative quality of life after salvage surgery for HNSCC.; and 2) to utilize disease free interval (DFI), length of stay (LOS), and hospitalization ratio (HR) to quantify the impact of disease on patients after salvage surgery for recurrent HNSCC, therefore serving as a model for future studies to use similar surrogate markers to study quality of life after salvage surgery.

Methods and Materials

We studied patients from a prospective database who underwent salvage surgery with microvascular reconstruction for recurrent HNSCC between 9/1/2019 and 12/31/2021. Adult patients undergoing surgery at University of Pittsburgh Medical Center for recurrent or second primary disease after prior chemoradiation were included.

Primary outcomes included time spent in the hospital and quality of life outcomes, which were assessed for prognostic indicators such as histology, stage, and grade.

DFI was defined as time from end of primary treatment until recurrence or death. LOS was defined as hospital stays at the University of Pittsburgh Medical Center for reasons related to surgery or cancer treatment. HR, a novel metric previously described in a study on sinonasal malignancies from the same institution, was defined as the ratio of length of hospital stay for any primary complaint related to salvage surgery to total days alive after surgery up to one year.

The University of Washington-Quality of Life survey was used as a validated survey metric to describe pre- and post-operative functional methods before and after salvage surgery.

Results

This study included 68 patients total, and the average age was 65.21. Of the total cohort, 48 were male and 20 were female. Of the 66 patients with race reported, 100% were white, and 98.5% were non-Hispanic.

The mean disease free interval (DFI) for the total cohort was 35.88 ± 42.30 months. The mean length of stay of initial admission (LOS) for the total cohort was 11.26 ± 5.87 days. The mean hospitalization ratio was 0.057 ± 0.083, meaning patients spent on average 5.7% of the first year after surgery in the hospital. LOS, DFI, and hospitalization ratio were not significantly different between subgroups.

UW-QOL scores were available pre- and post-operatively in 25 patients. Mean scores were significantly decreased between the pre-operative and post-operative periods for swallowing ($p = 0.0057$), chewing ($p = 0.0079$), and speech ($p = 0.0001$).

Table 1. Outcome variables after salvage surgery for recurrent HNSCC

	Mean	Standard Deviation
Disease Free Interval (months)	35.88	42.30
Length of Stay (days)	11.26	5.87
Hospitalization Ratio	0.057	0.083

Discussion

Studying quality of life and impact of disease is an important consideration after salvage surgery to determine which patients would benefit from this intervention. Previous studies have primarily focused on predictive factors and outcome variables such as disease free interval and length of stay. This is the first study to the authors' knowledge using hospitalization ratio as a metric for quality of life and disease burden after salvage surgery for HNSCC.

Few previous studies have directly compared outcomes between different histologic subtypes and grades to determine whether certain primary cancers would benefit from salvage surgery over others. In the present study, no significant differences were found in DFI, LOS, HR, and UW-QOL scores between subgroups. This may be because recurrent HNSCC has high morbidity and mortality regardless of subtype, but this must be studied further.

Conclusions

Utilization of salvage surgery for treatment HNSCC is standard of care, but no clear guidelines have been established to determine which patients would benefit. Salvage surgery may lead to increased hospital utilization and worse quality of life outcomes in certain patients. Future studies, both in studying HNSCC and other malignancies, can use hospitalization ratio as a metric to study quality of life outcomes after oncologic surgery.

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