Level-Wise Neck Lymph Node Positivity After Selective Neck Dissection (I-III) in Oral Squamous Cell Carcinoma Patients

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Abstract

Objective: To determine the levels of neck lymph node positivity after selective neck dissection (I-III) in oral squamous cell carcinoma patients. **Study design:** A cross-sectional study **Place and Duration:** Oral and Maxillofacial surgery department of Liaquat university of medical and health sciences Jamshoro from January 2020 to December 2022 **Methodology:** A total of 50 patients with oral squamous cell carcinoma were included in this study. All the patients were gone through selective neck dissection (I-III) and the Levels of neck lymph node positivity were determined. Pathological tumor staging was done as T1, T2, T3 and T4. Histological differentiation was labelled differentiation, moderate differentiation and poor differentiation as well. **Results:** The mean age of the study participants was 40 years. Regarding the side of oral cavity involvement, 23 participants had the right side and 27 participants had left side involvement. Buccal mucosa was the most common site (56%), followed by the tongue (20%). A total of 22 (44%) participants had the T2 stage, while 13 (26%) had the T4 stage. Overall 31 cases (62%) had no positive node level, 10 (20%) had positive node level I, 5 (10%) had positive node level II and 4 (8%) had positive node level III. A total of 36 participants (92%) had moderate differentiation, while 3 (6%) had well differentiation. **Conclusion:** There was no conclusive correlation between node positivity among the various oral cancer subsites. The most frequently affected neck levels are level I and level II. Most of the study participants had no positive neck lymph node level, while the positive level at I was present in 20% of cases, Level II in 10% of cases and level III in 8% of cases.

Keywords: neck lymph node positivity, oral squamous cell carcinoma patients, selective neck dissection

1. Introduction

Oral squamous cell carcinoma (OSCC) is a group of cancers with a wide range of etiologies that are categorized by geographic location. [1] At 2.7 per 100,000, the predicted age-standardized rate is comparatively high. With an anticipated 202,000 new cases of oral cancer in 2012, this rate is 3.7 for males and 1.8 for women. [2] Due to regional, ethnic, and socioeconomic inequalities as well as variances in the prevalence and seriousness of risk factors in different populations, the burden has a diverse distribution around the globe. According to recent GLOBOCAN (Global Cancer Observatory) figures, there will be 377,713 new cases of oral cancer and 177,757 fatalities worldwide in 2020. [3]

One typical head and neck cancer is tongue cancer. The tongue was the second-most often affected site in the oral cavity in two investigations from Pakistan. [4, 5] Curative surgery aims to remove cancer with a sufficient margin of healthy tissue. More commonly than any other place in the oral cavity, tongue cancer can spread to the cervical lymph nodes. The most crucial prognostic feature is nodal status at presentation; if nodes are damaged, the likelihood of recovery is cut in half. Therefore, treatment failure in the neck is a serious issue. [6]

An aggressive localized cancer is oral squamous cell carcinoma (OSCC). Survival is impacted by timely therapy of neck node spread, a key prognostic

doi.org/10.31838/hiv23.03.337 Received: 15.11.22, Revised: 28.12.22, Accepted: 19.01.23.

indicator. [7] The spread of this malignancy to cervical nodes, which is the most prevalent in Southeast Asia, has a significant impact on prognosis and survival rates. Surgery has developed from radical to selective neck dissection (SND), however, it is still not the best treatment option for nodal metastases in the neck.

Surgery could be tailored to balance morbidity and oncological outcomes according to the distribution pattern. The recommended treatments for treating and extending the lives of individuals with oral squamous cell carcinoma include neck dissection (ND) and primary tumour resection. The clinical and imaging classification of cervical metastasis, the "T" stage, and the location of the initial tumour all affect how many cervical lymph nodes must be removed. [8]

The histological presence of lymph node involvement in the absence of clinical or radiological signs is referred to as occult metastases (micrometastases). Even from early tongue cancer (T1 and T2) metastases, there is a high incidence. More than 30% of patients with early cancer exhibit it. [9]

SND, or selective neck dissection, is a new idea in treating locally advanced oral malignancies. Recent research supports the viability of SND in some early-stage oral malignancies with node positivity. The appropriateness of SND in advanced primary (T3/T4) clinically node-positive (cN+) oral cancers is uncertain. Selective neck dissection (SND) and/or a form of comprehensive neck dissection (CND) are two surgical procedures used to manage the neck when treating oral malignancies. [10]

In 50 patients who underwent selective neck dissection (I-III) between January 2020 and December 2022 and had oral squamous cell carcinoma pathologically established, the current study assessed patterns of dissemination to neck nodes.

2. Methodology

Patients with surgical procedures including selective neck dissection (I-III) between January 2020 and December 2022 and histopathological confirmed oral squamous cell carcinoma were included in the study. Standard protocol-based care was provided in accordance with accepted global management standards. The neck dissection terminology and common, universally accepted neck compartment classification were used in this work.

Overall 50 patients in all met the aforementioned inclusion requirements. These patients' neck nodes' clinical, surgical, pathological, and level-specific data were examined in connection to the pattern of involvement. Age, sex, anatomical location of the tumour, TNM categorization as T-stage, grading, and lymph node involvement were all noted and analysed. Following surgery, cases of each patient have been reviewed with known histological outcomes. Continuous data were transformed into categorical groupings for convenience of comparison. The frequencies of all categorical variables were reported as percentages.

3. Results

The mean age of the study participants was 40 years. Regarding the side of oral cavity involvement, 23 participants had the right side and 27 participants had left side involvement. We also looked at how many lymph nodes were affected by pathology by subsite. Buccal mucosa was the most common site (56%), followed by the tongue (20%). (As shown in Table 1). A total of 22 (44%) participants had the T2 stage, while 13 (26%) had the T4 stage. Overall 31 cases (62%) had no positive node level, 10 (20%) had positive node level I, 5 (10%) had positive node level II and 4 (8%) had positive node level III. A total of 36 participants (92%) had moderate differentiation, while 3 (6%) had well differentiation. (As shown in Table 2)

Table 1: General demographics of study participants n=50

Age (Years)	
Minimum	26
Maximum	71
Gender	
Male	34 (68%)
Female	16 (32%)
Side	
Right side	23 (46%)
Left Side	27 (54%)
Oral subsite wise distribution	
Buccal mucosa	28 (56%)
Lower labial mucosa	6 (12%)
Upper labial mucosa	1 (2%)
Tongue	10 (20%)
Maxillary alveolus	2 (4%)
Mandible alveolus	2 (4%)
Floor of mouth	1 (2%)

Table 2: Tumor characteristics of the study participants n=50

Pathologic tumor stage	
T1	8 (16%)
T2	22 (44%)
T3	7 (14%)
T4	13 (26%)
Pathologic positive neck lymph node level	
No positive nodes	31 (62%)
Positive nodes at level I	10 (20%)
Positive nodes at level II	5 (10%)
Positive nodes at level III	4 (8%)
Histologic differentiation	
Well differentiation	3 (6%)
Moderate differentiation	46 (92%)
Poor differentiation	1 (2%)

4. Discussion

An aggressive localized malignancy is oral squamous cell carcinoma. Furthermore, nodal involvement has long been a contentious therapeutic issue while being a crucial prognostic component. The classic radical neck dissection of neck nodes has given way to more functional, conservative, and less morbid techniques

In this study, buccal mucosa was the most common site (56%), followed by the tongue (20%). According to a local study, out of the total 398 cases, 95% of them had squamous cell carcinoma, and the most prevalent location in the oral cavity was the alveolus (37.9%), followed by the tongue (31.2%), and oral mucosa (13.4%), which includes buccal mucosa and gingival tissue. Palate, lips, and the floor of the mouth, which account for 2% of cases, are the least prevalent sites for oral cancer. [15]

While in a different local investigation, the buccal mucosa 34 (50%) was the site of OSCC incidence most frequently, and the floor of the mouth 1 (1.5%) had the fewest cases of OSCC. A total of 53 instances (77.9%) of the total sample size's reported cases fell into the 31–60 year age range and tended to be more frequently reported in men than in women. However, women were more likely to have OSCC of the hard palate and upper alveolar mucosa. [16]

In this study, a total of 22 (44%) participants had the T2 stage, while 13 (26%) had the T4 stage. Gouri H. Pantvaidya et al. discovered a different outcome after prospectively evaluating 583 neck dissections. A total of 95.7% of all metastases took place at levels I to IV. Overall, 3.8% and 3.3%, respectively, of metastases to levels IIB and V were observed. [11]

Our study's findings were consistent with those of the Suryanarayana Deo et al's study. The most frequent oral subsite was buccal mucosa (28.78%), whilst the least frequent was lip (5.08%). The most typical kind of neck dissection was modified neck dissection (69.75%). The most common neck levels for nodal involvement are Level I (62.54%) and Level II (57.33%). Pathological node positivity was recorded in 39.8% of individuals. Less frequently (7.17%) were Level III to V participants involved. There was no conclusive correlation between node positivity among the various oral cancer subsites. Neck levels I and II are most frequently affected. [12]

Buccal mucosa, tongue, and lower alveolus were the most frequent tumour subsites in a local investigation, accounting for 40, 37, and 14% of cases, respectively. In 22, 14, 25, 22, and 15% of instances, the pathological staging of the tumour was stage-I, stage-II, stage-III, stage-IVa, and stage-IVb, respectively. [14]

In our study overall 31 cases (62%) had no positive node level, 10 (20%) had positive node level I, 5 (10%) had positive node level II and 4 (8%) had positive node level III. A total of 36 participants (92%) had moderate differentiation, while 3 (6%) had well differentiation. Level I was most frequently involved in a different study, with 35% of participants having positive nodes in more than one level. Only 3.9% of patients had involvement at level III, and neither level IV nor level V had any solitary patients. [13] The overall clinical and pathological nodal positive rates were 75% and 52%, respectively, according to a local investigation. The stations most frequently implicated were those at Level I (48%) and IIa (20%). Only 5% of level IV and level V tumours were combined, and neither level IV nor level V reported any skip metastasis. [15]

5. Conclusion

Only 38% of OSCC patients receiving neck dissection exhibit pathologic node-positive. The most frequent neck levels for nodal involvement are levels I and II of the neck. Most of the study participants had no positive neck lymph node level, while the positive level at I was present in 20% of cases, Level II in 10% of cases and level III in 8% of cases.

6. Funding source

None

Conflict

No conflict of interest

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