

# Incidence of level IV nodal metastasis in oral squamous cell carcinoma - A retrospective study in South Indian patients presenting in an oral cancer institute (2016-2017)

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## ABSTRACT

The aim of this study was to retrospectively analyze the incidence of histopathologically positive level IV nodal metastasis in oral squamous cell carcinoma (SCC) with respect to T stage of primary tumor, primary site of tumor, and clinical nodal staging. All operated oral SCC case files from 2016 till present date were analyzed. Data included were patient age, habits, primary site of tumor, T stage, clinical N stage, neck dissection performed, number of nodes harvested, and histopathologically positive infiltration in level IV. Statistical analysis was done using SPSS software version 20. Chi-square test was used to find the association between the variables. A total of 30 patients were included. 22 patients underwent modified radical neck dissection (MRND) Type II neck dissection, while 6 patients underwent MRND Type III and 2 patients who underwent SOND were not included in the study. Nodal metastasis in level IV was observed in 3 patients. All of these three patients had T4a lesions. 1 of 6 tongue ( $P = 0.002$ ) CA patients and 2 of 2 CA maxillary alveolus had metastasis in level IV ( $P = 0.002$ ). None of the patients with clinical N0 or N1 nodal staging had histopathological evidence of infiltration in level IV. Of the 9 patients who had early-stage lesions, 6 were tobacco users. It was found that none of them had level IV metastasis. Furthermore, it was observed that irrespective of the site involved, T4 lesions had the highest risk of metastasis to level IV nodes. The results of this study show that the incidence of level IV metastasis is comparable to that of western countries.

**Keywords:** Nodal metastasis, SCC, T4 lesion, tumor, infiltration

## Introduction

The sixth most common cancer in the world is oral cancer, in which more than 90% are oral squamous cell carcinomas (SCCs). Oral SCC proves to be a major problem in India which has the highest incidence and prevalence.<sup>[1]</sup> The factors influencing the head and neck SCC (HNSCCs) are tobacco, alcohol, diet and nutrition, viruses, radiation, ethnicity, familial and genetic predisposition, oral thrush,

immunosuppression, use of mouthwash, syphilis, dental factors, occupational risks, and mate.<sup>[2]</sup> The most common site affected is the buccal mucosa (63.75).<sup>[3]</sup> HNSCCs have advanced disease at the time of presentation, 43% have regional disease, and 10% have distant metastasis.<sup>[4]</sup> This can be attributed to the use of chewable tobacco which is widely prevalent in India.<sup>[5]</sup> In the west, the most common etiology is human papillomavirus (HPV) infection. HPV-16 and HPV-18 are implicated in almost all cases.<sup>[6]</sup> HPV-positive malignancies represent 5–20% of all HNSCCs.<sup>[7]</sup> The use of chewable tobacco is associated with an aggressive form of the disease.<sup>[8]</sup> Prognosis depends on the stage of presentation of the disease. The most important factor which determines the long-term survival of a patient is the presence of lymph node metastasis. The rate of occult lymph node metastasis increases in HNSCCs.<sup>[9]</sup> The presence of nodal metastasis decreases the long-term survivability of a patient by 50%.<sup>[10]</sup> Lung metastasis is higher in lymph node tumor than primary tumors.<sup>[11]</sup> The chances of metastasis to the lungs and other vital organs increase as the metastasis goes down from lymph node levels I–IV. The average prevalence of

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Table 1: Involved primary sites

Primary site	T-stage	P	Clinical N stage
Tongue	4a	0.02*	2a
Maxillary alveolus	4a		2b
Maxillary alveolus	4a		2b

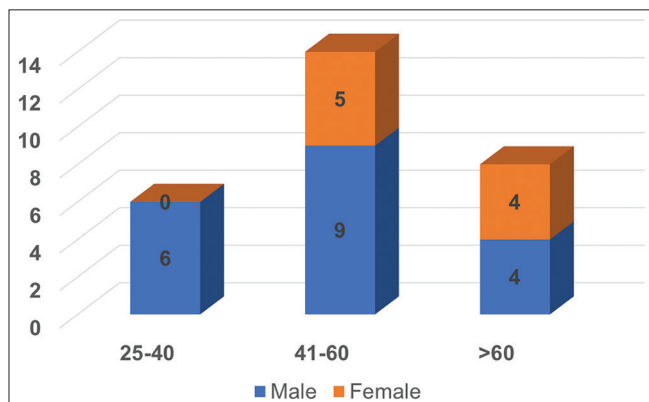


Figure 1: Demographic data

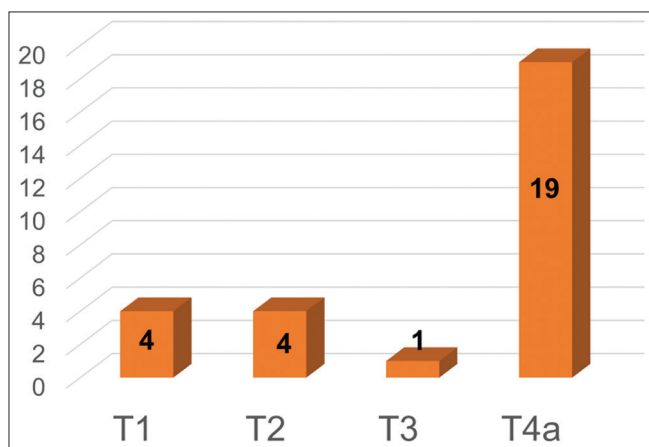


Figure 2: T stage

level IV nodal metastasis is 10%.<sup>[12]</sup> The investigative techniques for detecting neck lymph node metastasis are as follows: Computed tomography, magnetic resonance imaging, ultrasound, positron emission tomography, and sentinel lymph node biopsy.<sup>[13]</sup>

### Aim

The aim of this study was to retrospectively compare the data from western literature with those of South Indian population and the incidence of histopathologically positive level IV nodal metastasis in oral SCC with respect to T stage of primary tumor, primary site of tumor, and clinical nodal staging.

### Materials and Methods

All operated oral SCC case files from 2016 to 2017 present date were analyzed. Data included were patient's age, habits, primary site of tumor (Table 1), T stage, clinical N stage, neck dissection performed, and histopathologically positive infiltration in level IV. Inclusion criteria were patient records from the year

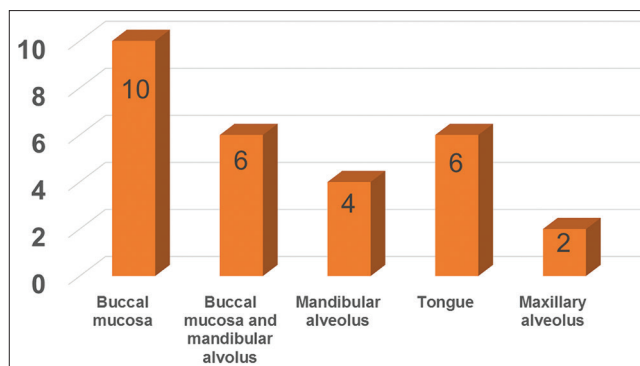


Figure 3: Sites involved

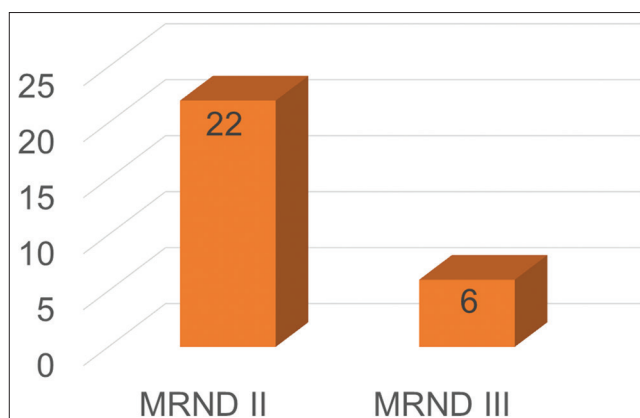


Figure 4: Neck dissection

2016 to 2017, histopathologically proven SCC cases, and neck dissections which included level IV. Exclusion criteria were patients operated before 2016, other types of carcinomas, sarcomas, and neck dissections not including level IV. Statistical analysis was done using SPSS software version 20. Chi-square test was used to find the association between the variables.

### Results

A total of 31 oral cancer case files were analyzed. (1) Patient had chondrogenic osteosarcoma and was excluded. (2) Patients had undergone supraomohyoid neck dissection and were excluded from the study. Therefore, a total of 28 oral cancer case files were selected for final data analysis. Demographic data revealed the majority of the patients in the 41–60 age groups. Majority affected were male patients (Figure 1). Of the 28 patients, 19 patients had T4a lesion while only 9 patients had early-stage disease which shows oral cancer awareness among the population is poor which is why patients seem to seek treatment only when the disease has progressed to a late stage (Figure 2).

Buccal mucosa seemed to be the most commonly affected site. 22 patients had undergone modified radical neck dissection (MRND) Type II, whereas 6 patients had undergone MRND Type III neck dissection (Figure 4).

## Incidence of level IV nodal metastasis

Level IV metastasis was found in only 3 of the 28 cases. 1 of 2 tongue CA cases and 2 of 2 maxillary alveolus CA cases had metastasis in level IV lymph nodes which was statistically significant (Figure 3).

## Discussion

As mentioned, tobacco chewing proves to be the major cause of oral SCC in India, whereas HPV has taken over as the major cause of oral SCC in the west. The most common site involved is comparable with that of other studies which is the buccal mucosa.<sup>[3]</sup> Nodal metastases in oral SCC occur initially on levels I–III, and further on, they metastasize to levels IV and V.<sup>[14]</sup> Extracapsular spread has a poor prognosis.<sup>[15]</sup> The incidence of level IV nodal metastasis in this study was 10.7%. Of the 9 patients who had early-stage lesions, even though 6 were tobacco users ( $P > 0.05$ ), none of them had level IV metastasis. Of the 9 patients who had early-stage lesions, even though 6 were tobacco users ( $P > 0.05$ ), none of them had level IV metastasis. Furthermore, it was observed that, irrespective of the site involved, T4 lesions had the highest risk of metastasis to level IV nodes. None of the patients with clinical N0 or N1 nodal staging had histopathological evidence of infiltration in level IV. Although this study was conducted in a small group of patients, it was found that metastasis to level IV was nil in early-stage cancer of the oral cavity. This is consistent with data from the literature from western countries,<sup>[12]</sup> where HPV-induced less aggressive form of oral cancer has minimal metastasis to level IV nodes.

## Conclusion

SCC of the oral cavity in India even though thought of as aggressive in nature<sup>[8]</sup> due to tobacco usage which the majority of our early-stage cancer patients had the habit of the incidence of level IV metastasis is comparable to that of western countries.

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