

## Frequency of Cervical Metastasis in Oral Cancer

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**ABSTRACT: OBJECTIVE:** To determine the frequency of cervical metastasis and involvement of neck node levels in different sites of oral cavity cancer. **STUDY DESIGN:** Non interventional. **Description.** **DURATION:** August 2007 to July 2010. **SETTING:** Department of ENT-Head & Neck Surgery DMC & CHK. **PATIENTS & METHODS:** A descriptive case series was carried out in ENT department, Dow University of Health Sciences & Civil Hospital Karachi. Sixty patients of biopsy proven oral squamous cell carcinoma (SCC) with or without palpable neck node(s) admitted in department of ENT CHK, were included in the study. Demographic data & personal information of the patients were recorded in a proforma which included the record of histopathological confirmation of cervical metastasis after neck dissection for neck metastasis along with involvement of neck level(s) for different sites of oral cavity cancer. **RESULTS:** Cervical metastasis of oral SCC was present in 33.33% cases. Level I (99.98%) and level II (83.33%) were commonly involved neck levels in buccal SCC. Similarly level I (50%) and level II (75%) were also commonly involved in tongue SCC while cervical metastasis was absent in lip and alveolar SCC. **CONCLUSION:** This study indicates that an elective neck dissection may be performed on a near routine basis in oral SCC.

**Key Words:** Oral cavity, Squamous cell carcinoma, Lymph node metastasis, Neck dissection, Neck node levels.

**INTRODUCTION:** Oral cancer is one of the commonest cancers in humans with high prevalence in subcontinent where it is the most common cancer in males<sup>1</sup>. The strongest association of oral cancer, out of many etiological factors, is chewing of various types of smokeless tobacco, including snuff, naswar and betel quid with tobacco<sup>2</sup>. Over 95% of carcinoma of oral cavity is squamous cell carcinoma<sup>3</sup> and the anterior tongue is the most common subsite<sup>4,5</sup>. Carcinoma of the tongue has a higher risk of metastasis to the regional lymph nodes. Subclinical nodal metastasis is present in up to thirty percent of T1 and T2 tongue carcinomas<sup>6</sup>. In our region cancer of buccal mucosa is commoner<sup>7</sup> but it has low rate of metastatic disease. Lymph node metastasis represent the most important negative prognostic factor in SCC of the oral cavity. Nodal metastasis increases with increasing T stage<sup>8</sup>. With neck nodes metastasis, survival drops by almost 50%<sup>9</sup>. Levels I, II and III are commonly involved with metastasis from oral cancers<sup>6</sup>. It is recommended that when the probability of cervical lymph node metastasis is more than 20 percent, neck should be electively treated<sup>6</sup>. This would therefore include all stage III and many T2 oral cavity carcinoma thicker than 3 mm<sup>10</sup>. Since the incidence of oral squamous cell carcinoma is on rise and the prognosis depend to a great extent upon cervical metastasis. We conducted this study to evaluate frequency of cervical metastasis and involvement of neck levels in squamous cell carcinoma at different sites of oral cavity. This may provide a guideline for extent of neck dissection. We hope that this study will serve as baseline for future studies and to develop guideline for management of oral squamous cell carcinoma with positive neck. The rationale of study was to select the histopathologically proven oral

squamous cell carcinoma with or without clinically palpable neck nodes and after primary resection of oral lesion & neck dissection, the specimen send for histopathological examination to determine frequency of cervical metastasis, and the level of involvement for various sites in oral cavity of squamous cell carcinoma. **PATIENTS AND METHODS:** Study was conducted at department of ENT-Head & Neck Surgery, Dow University of Health Sciences & Civil Hospital Karachi. Sixty patients of biopsy proven oral squamous cell carcinoma with or without palpable neck node(s) of any age and sex presented to ENT OPD and were admitted in ENT ward of Civil Hospital Karachi were included in the study from 1st Aug 2007 to 31st July 2010. All who were treated elsewhere and having no documentary proof, recurrent or residual diseases after surgery or exposure to chemo radiotherapy were excluded from the study. Demographic data, clinical findings of oral lesion and level of involvement with number & size of largest node & CT scan findings were recorded. In cases where there was suspicion of distant metastasis imaging studies like X-ray chest, ultrasound abdomen and / or C.T Scan (chest & abdomen) if needed were done & findings were recorded in a preformed proforma. Punch or Wedge Biopsy report and stage of the disease was also noted. Resection of primary lesion of oral cavity along with neck dissection was done under general anaesthesia The extent of neck dissection depends on the clinical status of neck. Therefore patients with palpable neck nodes usually had a modified radical neck dissection or radical neck dissection while patients with clinically impalpable or sometimes limited clinical N1 disease usually had selective neck dissection. Specimens of neck dissections were marked according to surgical neck levels and sent for histopathological examination. The histopathological

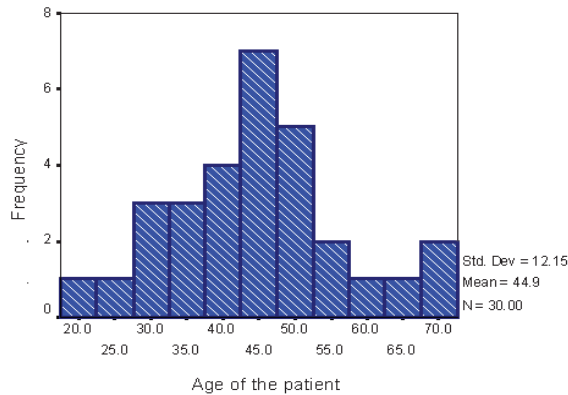


Figure 1: Presentation of Ca oral cavity in different age groups.

findings of neck level(s) involvement in different sites of oral cancer were also recorded in the proforma. Data was analyzed by using SPSS version 10. Descriptive statistics, frequencies and percentages were computed for qualitative variables like gender, site & characteristic of carcinoma, presence of neck nodes, stage of disease, type of neck dissection and histopathologically proven neck nodes level(s) for various sites of oral cavity. Mean, standard deviation, minimum & maximum of quantitative variable like age of patient were also calculated.

**RESULTS:** A total of 60 cases, out of which 38 (63.33%) were male and 22 (36.66%) were females with male to female ratio of 1.7: 1. The mean age was 44.93 years ± 12.15. The youngest patient included in the study was 20-years and oldest patient was 70-years. The range was 50 years, median 45 yrs and mode was 45 yrs as shown in figure-1. Out of 60 cases 38 (63.33%) patients presented with buccal SCC while 14 (23.33%) with tongue SCC, 6 (10%) with lip SCC and 2 (3.33%) with lower alveolus. The characteristic of primary lesion was usually ulcerative in 54 (90%) patients while 6 (10%) patients were presented with exophytic primary lesion. In our study, 22 (36.66%) patients were presented with clinically palpable neck nodes (cN+) while in 38 (63.33%) the neck nodes were not palpable. Out of 38 cases of buccal carcinoma 12 (31.57%) cases were presented with cN+ out of which 8 (66.66%) were at level I and 4 (33.33%) at level II. In 14 cases of carcinoma tongue, 8 (57.14%) patients had cN+ in which 2 (25%) patients presented at level I, 4 (50%) patient presented at level II and 2 (25%) patient presented at both levels I & II. In lip carcinoma out of 6 cases 2 (33.33%) patient had cN+ at level I. CT scan positive neck nodes were found in 34 (56.66%) patients while distant metastasis was not found in any case. In this study 46 (76.66%) patients presented with stage IV disease while 14 (23.33%) patients presented with stage III disease. Different types of neck dissection were performed in all 60 patients on the basis of clinical findings. In 40 (66.66%) patients selective neck dissection was performed, 16 (26.66%) patients had modified radical neck dissection and 4 (6.66%) patients had radical neck dissection. In our study 12 (20%) patients of buccal SCC had histopathologically positive neck nodes while 8 (13.33%) patient of tongue SCC had metastatic neck nodes (Table 1) while lip and lower alveolar SCC had no metastatic neck nodes. In these 12 cases of

Site of Oral SCC	No.	pN+(%)
Buccal mucosa	12	20
Tongue	8	13.33
Lip	0	0
Lower Alveolus	0	0
Ca Oral cavity	20	33.33

Histopathological proven individually involved neck levels in Buccal SCC (n = 12)

Level (s)	No	%
I	12	100
II	10	83.33
III	6	50
IV	2	16.66

Histopathological proven individually involved neck levels in Tongue SCC (n = 8)

Level (s)	No.	%
I	4	50
II	6	75
III	2	25

Table 1: Cervical metastasis in Oral SCC.

histopathologically positive neck nodes of buccal SCC metastasis to only level I was found in 2 cases, 4 (33.33%) patients had level I & II involvement, 4 (33.33%) at level I, II & III while 2 (16.66%) patients had the involvement at level I, II, III & IV. The individual involvement of neck levels in buccal SCC were 12 (99.98 %) at level I patients, 10 (83.33%) at level II, 6 (49.99%) at III and 2 (16.66%) at level IV. In 8 cases of carcinoma tongue, 2 (25%) patients had involvement at level I, metastasis shown at level I & II is 4 (50%) while at level I, II & III in 2 (25%) cases. The individual involvement of neck levels in tongue SCC were level I in 4 (28.5%) patients, 6 (75%) at level II patients and 2 (25%) at level III patient.

**DISCUSSION:** Head and neck cancer constitute approximately 5% of all malignancies worldwide, and the incidence is increasing. The great majority of these tumors are SCC, which accounts for about 95% of all head and neck tumors<sup>11</sup>. The lymph node status is generally considered as the most important prognostic factor in patients with SCC of oral cavity and in fact the presence of nodal metastasis decrease survival to about 50%<sup>12, 13</sup>. Overall, cervical metastasis is present at initial evaluation in approximately 30% of patients, except for the lips and hard palate. Considering all T categories, the frequency of occult metastasis ranges from 19% to 40%<sup>14</sup>. Haddadin et al found that tongue tumors have a high incidence of subclinical nodal disease, which is less curable when clinically presented. There is high association between the survival rate of patient and presence of metastatic neck nodes at the time of presentation. Mathew-Iype reported statistically significant difference in disease free survival in patients with N0-N1 disease as compared to N2-N3<sup>15</sup>. In our study 36.6% patients presented with clinically palpable neck nodes, which was in contrast to G.I Smith et al study that found clinically palpable neck nodes only in 21 out of 171 patients (12.28%) in oral SCC<sup>16</sup>. Our study also revealed that tongue carcinoma had high chances of clinically palpable neck nodes (cN+= 57.14%)

as compared to buccal carcinoma (cN+ = 31.57%) and lip carcinoma (cN+ = 33.33%). This may be due to rich lymphatic drainage of tongue as compared to other sites of oral cavity. In our region due to excessive betel nut pan chewing habits there is formation of submucous fibrosis, which decreases the lymphatic flow from buccal and labial mucosa. The critical determinant of the utility of an imaging modality for oral cavity SCC is its ability to detect the presence or absence of metastatic neck disease. Umeda et al found that CT scan was very useful in early detection of neck metastasis<sup>17</sup>. As the sensitivity and specificity of the clinical examination is low. We also suggest CT scan prior to management of the neck in every case. In this study on CT scan, positive neck nodes were found in all cases of advanced disease that is stage IV (76.66%) & stage III (23.33%). The late presentation in this study may be due to delayed referral of patients to our tertiary care hospital, lack of education, poor socioeconomic status and inadequate health facilities. The results of several studies confirm that late presentation is a common phenomenon in most developing countries. In an under develop country like Pakistan, the people ignore their diseases in the early stages. It is the responsibility of general practitioners, dental surgeons and otolaryngologists that they spend little more time on their patient's education about the disease. At present, neck dissection with histopathologic examination is the most reliable staging procedure that provides important prognostic information. In this study neck dissection was done in all cases whether neck node(s) were clinically palpable or not. In majority of the cases selective neck dissection was done (66.66%) in clinical N0 disease and also in some cases of limited clinically N1 disease. Most of these cases belonged to buccal SCC because it had low metastatic rate due to submucous fibrosis. In limited clinical N1 disease the neck was selectively addressed from level I- IV. Similarly modified radical neck dissection (26.66%) and radical neck dissection (6.66%) was performed in cases with palpable neck nodes. In our study it was more commonly performed in patients of tongue SCC because they presented with palpable neck nodes. The increase metastatic rate in tongue SCC attribute to its high mobility during mastication and swallowing. We found over all histopathological positive neck nodes in oral SCC as 33.33%, while in contrast Woolgar reported 47.5% cervical metastasis<sup>18</sup>. Similarly it was also revealed from our study that 20% neck metastasis found in buccal SCC and histopathologically proven involvement of neck node(s) found more commonly at level I (99.98%) & II (83.28%) which was comparable to Dhawan et al in which 16% neck metastasis was present in buccal SCC and level I and II were the most frequent levels involved in buccal SCC<sup>19</sup>. Rao et al reported cervical metastasis at level I in 85 % and at level II in 51% cases<sup>20</sup>. Pardhan et al found comparatively more neck metastasis (42.5%) in buccal SCC and also observed level I was the most frequent level involved in buccal SCC<sup>21</sup>. In our study 13.33% neck metastasis was seen in tongue SCC and histopathologically proven metastasis in neck were observed in level I (50%) and level II (75%). In contrast Nithya et al observed that the most commonly involved level in tongue SCC was level II (63.6%) followed by level I (51.5%)<sup>22</sup>. Similar results were also found in

Alkhalil study<sup>23</sup>. It is mentioned in the literature that lymphatics of level I and II are the first echelon lymph nodes of oral cavity. This pattern is reflected in our case series as well as in others that levels I and II are more frequently involved than other levels in oral SCC. Byers et al found skip metastasis in lymph nodes at level III or IV in 15.8% in tongue SCC<sup>24</sup>. This suggests that supraomohyoid neck dissection cannot take care of such patients. Although in this short series of tongue SCC there was no metastasis to level IV but another study carried out by Nithya showed involvement of level IV (15.2%) along with levels I, II & III, while Khafif et al reported only 4% involvement of level IV lymph nodes along with involvement of upper levels in early tongue SCC<sup>25</sup>. Most of them suggest dissection of level IV & V only when there is intraoperative suspicion of extensive metastasis in levels I, II and III<sup>26</sup>. Nabeel Riaz also described efficacy of SND (supraomohyoid neck dissection) in clinically N0 disease of oral SCC and found that SND was the procedure of choice in all T3N0M0 disease of oral SCC while it was not enough for T4N0M0 disease<sup>27</sup>. These cases should be managed with MRND or RND<sup>28</sup>. Similarly De Zinis et al suggested that in clinically N0 disease of oral SCC, SND should include level IV along with level I-III due to possibility of skip metastasis, while in clinically palpable neck nodes MRND should be considered<sup>29</sup>. In the light of present results, we suggest elective neck dissection should be performed on routine basis in oral SCC, level IV should be addressed whenever a selective neck dissection is performed in clinical N0 disease. Further more histopathological findings did not completely correlate with CT scan findings, there is a need for a noninvasive procedure that provides high-quality prognostic & diagnostic information. Nowadays in many tertiary care centers of developed countries more advanced imaging modality is used in the form of 18F-FDG PET or combined 18F-FDG PET with CT scan for better detection of metastatic neck nodes prior to surgery<sup>30</sup>. We suggest that health department make such advanced imaging modality available in tertiary care units of our country for better management of our patients.

**CONCLUSION:** Squamous cell carcinoma of oral cavity is a favourable site of cervical metastasis. Buccal mucosa (cheek) and tongue are common subsite of oral cavity for neck node metastasis. Level I and level II are more frequently involved neck levels than other levels in buccal SCC and tongue SCC. Considering the high frequency of cervical metastasis in squamous cell carcinoma of oral cavity, neck dissection should be performed on routine basis.

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