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## Presence of nodal metastasis in early oral cavity cancer: A retrospective study

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### Abstract

**Objectives:** The pattern of metastasis in the neck nodes and associated clinical factors in patients with oral cavity cancer were the subjects of this research, and their patterns were evaluated.

**Materials and Methods:** Patients with oral squamous cell carcinoma (OSCC) who did not have a history of other cancers and who were not currently undergoing neo-adjuvant concomitant chemo-radiotherapy or radiotherapy were chosen for research. In total, 300 patients met these criteria.

**Results:** 109 out of 300 instances of oral squamous cell carcinoma patients with clinically and radiologically N0 neck had microscopic evidence of metastatic lymphadenopathy. There is a possibility of metastases in level IIB, but they are much more common in levels IB, III, and IV. Positive nodes on level IIB were correlated with three positive nodes on level IIA.

**Conclusion:** During the follow-up, there was a substantial correlation between the size of the primary tumor and the number of distant metastases.

**Keywords:** Metastasis, squamous cell carcinoma, prevalence, neck nodes

### Introduction

The presence of cervical lymph node metastasis is the important prognostic factor of Squamous cell carcinoma of the head and neck and number of factor effect the control and spread of the disease. To increase chance of patient survival management of neck metastases should managed properly.

Jemal *et al.* 2010 stated that cancer stage distribution at diagnosis, regional spread is more frequent in cancers of oral cavity and pharynx compared to other cancers, including such as prostate, breast, lung and bronchus, and colorectum [1]. Even in small tumors (T<sub>1</sub> or T<sub>2</sub>) has a relatively high propensity of regional lymph node metastasis in advanced SCC of oral cavity.

Crile in 1906 proposed Radical neck dissection for standard treatment of neck dissection [2]. With several controversies exist about the management of neck dissection varying with timings and different treatment modalities. A decayed later Functional Neck Dissection is proposed which preserves non-lymphatic structures, has replaced the position of RND [3]. Management of N0 neck is still controversial and dilemmas to the head and neck surgeons. Due to new insights into lymphatic drainage pathway there were again modification was propose Modified neck dissection, Selective neck dissection, extended radical neck dissection and super selective neck dissection (Nidusectomy) [4].

Fielding *et al* stated that the most important causes of this poor prognosis, with regional metastasis having 5-year survival rates when there is local recurrence in the oral cavity and metastasis through the lymphatics to regional lymph nodes [5]. Myers *et al.* Shaw *et al.* 2009 2001 concluded that, If dissemination to regional lymph nodes takes place, the survival rate reduces to nearly 50%. Extracapsular spread and multiple metastasis has influenced the survival rates [6, 7]. Shah on his retrospective study concluded that Oral cavity cancer is at highest risk of metastasis at Levels I, II, and III were Oropharynx, hypopharynx and larynx metastasis at levels II, III, and IV and recommended that for N0 patient Supraomohyoid neck is good while and squamous cell carcinomas of the oropharynx, hypopharynx, and larynx anterolateral neck dissection are recommended [8].

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Countless study has been published regarding elective treatment in N0 neck, Kligerman *et al* suggested only one trial with follow-up of 5 year [9]. Vandenbrouck and co-workers suggested no difference between the elective and therapeutic neck dissection [10]. Yuen *et al*, Pointon and Gleave sustain with wait and watch policy for N0 neck [11, 12].

### Material and Method

This retrospective study was started in January 2014 to 2018 in Dr. Bhem Rao Ambedkar Memorial Hospital, Regional Cancer Center, Raipur, Chhattisgarh. In this study 300 consecutive patient were included reported with Oral Cavity Cancer, (Histologically Squamous Cell Carcinoma) preoperative biopsies of the primary tumors were taken to confirm the clinical diagnoses. According to the 2002 American Joint Committee on Cancer classifications TNM staging was allocated. Having Clinically N0 neck with T1 & T2 tumors. Preoperatively all 300 patient underwent for complete Physical examination and evaluated for N0 neck by CT Scan and MRI for detecting N0 neck and clinically correlated. Diagnosis of Cervical metastasis CT scan has improved the accuracy while ultrasonography scanning improved the overall diagnosis [13, 14]. Van den Brekel *et al.* proposed follow-up policy with US-FNAC, Hodder *et al.*, Richards *et al* also concluded to similar conclusion with 'wait and see' policy [15, 16, 17].

All 200 patients were undergone tumor resection with unilateral neck dissection and reconstructed (local or Micro vascular free flap).

For inclusion criteria patient age between 28-69 years with male and female ratio. Clinically and radio-graphically N0 neck with T<sub>1</sub> & T<sub>2</sub> tumor.

Exclusion criteria patient with multiple tumors, previously operated tumor

### Surgical technique

Straight horizontal cervical skin incision upper crease from the thyroid cartilage to middle of sternocleidomastoid muscle of approximately 8-9 cm with scalpel. Subplatysmal flap elevated superiorly till border of mandible, anteriorly till contralateral belly of digastric muscle, inferiorly till clavicles and posteriorly till posterior border of Sternocleidomastoid muscle in which lip split is not required [18]. In some patients lip split incision is given. Extended supraomohyoid neck dissection done from level IA to level IV and lymph node was disaffiliate from anterior border of digastric muscle till contralateral belly of digastric muscle. Level IA detached from IB at the posterior border of the anterior belly of digastric muscle. Level IB was disaffiliated from level II at its attachment in the posterior margin of the

submandibular gland and posterior belly of the digastric muscle. Levels II, III and IV were detached from level V at the posterior border of sternocleidomastoid muscle. At the level of hyoid bone Level II was separated from level III and at the level omohyoid muscle level III was separated from level IV. Levels IIA and IIB were separated by the plane of spinal accessory nerve. All lymph node levels from level IA to level IV, were sent to histopathology department in Dr. Bhem Rao Ambedkar Hospital, in separate specimen bottles for histopathological analysis. Wide local excision of tumor is done with a margin of 1.5 cm. Some patient's primary closure was done, while in rest of the patients where primary closure is not possible, distant and micro vascular flap were used for reconstruction.

A complete follow up were taken every month for 6 month to 3 year. Some patients again treated for the residual disease and recurrence diseases.

### Results

Total 300 patients of Oral Squamous cell Carcinoma with clinical and radio logically N0 neck were included in our retrospective study. All the patients were undergone an Extended Supraomohyoid neck dissection from level I to level IV. Each nodes were separated from each other and send separately in individual bottles and send for histopathological report. Table 1 shows the demographic characteristic of 300 patients.

Demographic representation of 300 patients Table 1, shows 171 male and 129 were female, ages ranged from 22 to 69 years. On histopathological analysis out of 300 patients with N0 level II B lymph node involvement was seen in tongue (1case) and 2 cases of buccal mucosa. Cervical node metastasis with primary cancer incidence and distribution shown in Table 2. While in level IIA 7 cases associated with metastases of upper lip (1), tongue (3), floor of mouth (1), buccal mucosa (2) and lower alveolus (1). 12 cases of tongue, 6 cases of buccal mucosa, 1-1 cases of upper alveolus and lower alveolus had level III node positive. While, only 3 cases had positive node with level II B positive node. On level IV histopathological examination 18/300 shows lymph node positivity. There was no case of skip metastases.

Overall analysis on the basis of histopathological examination 109/300 cases had microscopic metastatic lymphadenopathy in oral Squamous cell carcinoma patients with clinically and radio logically N0 neck. Rare metastases seen in level IIB and predominant in level IB, level III and level IV. Positive IIA node were associated with 3 positive node of level IIB.

Lymph node yield and ration elaborated in Table 3, Mean lymph node yield was. Level IIB and Level IV shows lowest lymph node ratio.

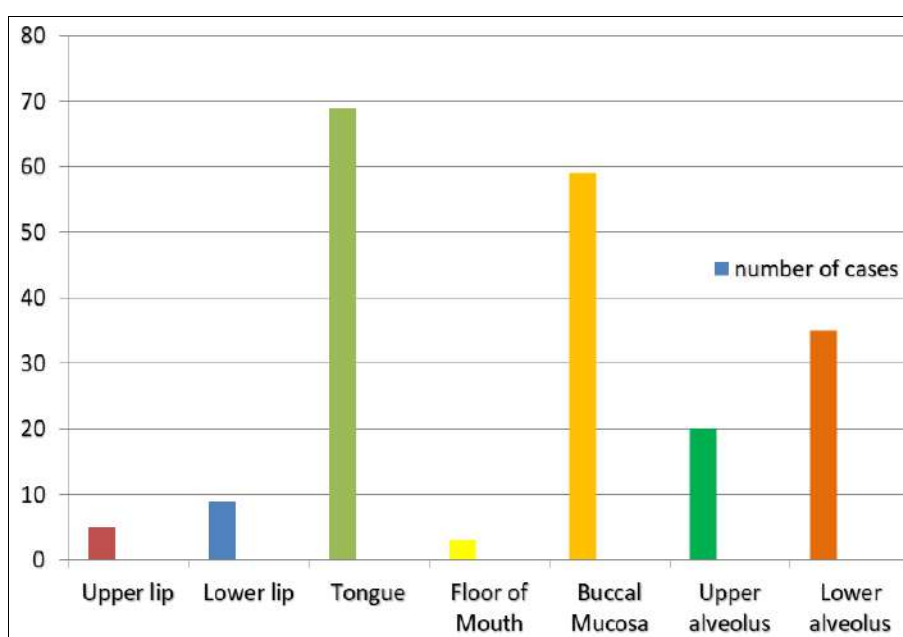
**Table 1:** Summary of demographic characteristics of 300 patients

S. No.	Variables	N (%)
1.	Age	Age (years)
	<45	159 (59.5%)
	>45	141 (40.5%)
2.	Sex	Male
		171 (51%)
		Female
		129 (49%)
3.	Clinical T staging	Clinical T-stage
	T1	125 (38%)
	T2	175(62%)
4.	Clinical N staging	Clinical N-stage
	N0-	300 (100%)
5.	Pathological T stage	Pathologic T-stage
	T1 (%)	135
	T2 (%)	165

6.	Pathological N Stage	Pathologic N-stage	
		N0	261 (80.5%)
		N1	25 (12.5%)
		N2A	11 (5.5%)
		N2B	03 (1.5%)
7.	Histological Grade	Wdscc + Mdsc	265 (97.5%)
		Pdscc	35 (2.5%)

**Table 2:** Showing patterns of Lymph node metastasis

S. No	Sub-site	No. of Cases	Incidence of Metastasis in Lymph node levels					
			IA	IB	IIA	IIB	III	IV
1.	Upper lip	15	0 (0%)	0 (0%)	1 (20%)	0 (0%)	0 (0%)	0 (0%)
2.	Lower lip	19	0 (0%)	3 (33.3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
3.	Tongue	82	0 (0%)	11 (15.9%)	3 (4.34%)	1 (%)	12 (17.3%)	9 (13%)
4.	Floor of Mouth	10	0 (0%)	9 (90%)	1 (10%)	0 (0%)	0	0 (0%)
5.	Buccal Mucosa	98	0 (0%)	27 (45.7%)	2 (3.3%)	2 (3.3%)	6 (10.1%)	5 (8.4%)
6.	Upper alveolus	20	0 (0%)	1 (5%)	0	0 (0%)	1 (5%)	0 (0%)
7.	Lower alveolus	56	0 (0%)	19 (54.2%)	1 (2.8%)	0 (0%)	1 (2.8%)	4 (11.4%)
	Total	300	0 (0%)	70(35.0%)	89(44.5%)	3 (1.5%)	20(10%)	0 (0%)

**Table 3:** Showing mean lymph node ratio in 300 patients

Lymph node level	Lymph node yield (range)	Lymph node yield (mean)	Lymph node ratio
IA	0-9	3.5	0
IB	0-10	4.1	0.07
IIA	3-22	10.6	0.03
IIB	0-9	3.6	0.003
III	0-19	8.2	0.005
IV	0-5	2.1	0

## Discussion

There have been a lots of study was done on Squamous cell carcinoma of oral cavity and its occult metastasis with diversity in treatment modalities. Various modification have been done from Radical to Modified, Selective, Elective neck dissection to decrease the morbidity [2, 9, 22, 19]. Among those studies Ho *et al* in 1992 conducted a study on 28 Oral Tongue patients and found that 42% of occult metastasis has been found and suggested wait and see policy for the disease [19]. Addition trial by Lim [20], Pointon and Gleave [12] Vandenbrouck [10] Yuen [21] espouses wait and watch policy for No neck.

The literature slowly shifted towards the elective neck dissection D'Cruz *et al.* in retrospective study of 359 patients found no

difference between observation and elective neck dissection who had early tongue cancer in 3 year and 5 year survival rates [22]. Kilgerman, suggested that supraomohyoid neck dissection in oral tongue and floor of mouth patients with a follow-up of 3 years [9]. Brazilian on their study demonstrated that SOH neck dissection can be recommended as standard elective treatment for patients with T<sub>2</sub>-T<sub>4</sub> oral squamous cell carcinomas. Recurrence and survival rates were similar in both the groups [23]. Spiro *et al.* emphasized that, SOHND is a reliable staging procedure in patients with N0 oral or oropharyngeal SCC. In conjunction with postoperative radiation therapy SOHND, was highly effective in controlling neck metastases [24]. Leyland *et al.* 2005 [25] retrospective of 3887 patients with SCC of head and neck cancers, results suggested that close observation, surgery, radiation or a combined modality [25].

Squamous cell carcinoma of the oral cavity is adequately treated by Surgery alone, is adequately treatment of early Squamous cell carcinoma of oral cavity with resection margins are tumor free. On the basis of this study they concluded, routine selective neck dissection [26, 27].

After description of Crile in 1906 Radical neck dissection till now various modification have been changed from more radical to more conservative [2]. Preserving lymphatics and non-

lymphatic structure (spinal accessory, internal jugular vein and sternocleidomastoid muscle) [28, 29]. Cheng *et al.* suggested that patients who underwent for selective neck dissection has least damage to spinal accessory nerve and shoulder dysfunction after neck dissection [30, 31]. For, N0 neck patients in Squamous cell carcinoma presently, Supraomohyoid neck dissection is commend [8]. Shibin *et al.* found no significant differences were found between patients treated with SOHND versus RND in oral Squamous cell carcinoma with N0 neck. Patterns of Lymphatics is a metastasis is a foreseeable in squamous cell carcinoma of head and neck for its treatment modalities [8, 33, 34, 35, 36, 37].

Lindberg's in 1972 showed neck metastases could be found in the submandibular triangle, sub-mental triangle, upper jugular chain, and mid jugular chain of lymph nodes of Squamous cell carcinoma of oral cavity tumor. "Skip metastases," were also described in which metastasis also could skip upper nodes and found in level IV or level V [36]. Which supported our study in which we got 18 positive nodes in level IV lower juguar chain.

A retrospective study was conducted by Bayers *et al* in 428 for direction of treatment in clinically N0 neck by Modified neck dissection. Supraomohyoid, the anterior, and the functional were performed as treatment modalities and resulted that metastasis is restricted to level I, II and III [38].

Again by Bayers, in 967 patients treated with a modified neck dissection were clinically staged N0 or N1 and stated that a functional neck dissection is effective neck treatment regardless of the primary site or stage of the disease [39].

Shah [40] and Shah [41] *et al.* in 1119 radical neck dissections reported that in therapeutic radical neck dissection for oral carcinoma the majority of nodal metastases was in levels I–III and level IV was involved in 20% of cases and level V in only 4%. In elective radical neck dissections, most common nodal metastases were in levels I–III. Level IV and V were involved in 9% and 2% of cases respectively. In selective neck dissections most common morbidities includes shoulder dysfunction due to traction or injury of spinal accessory nerve during removal of level IIB and chyle vessels injury during removal of level IV. Dissection of level IIB in oral squamous cell carcinoma with clinically node negative neck is controversial. This may be due to low reported risk of level IIB metastases and potential risk of shoulder morbidity.

The frequency of level IIB nodal metastases ranges widely in the literature, from 0% to 10.4% [42–44]. Major draw-backs of all of these studies had small sample size, except the study done by Pantvaitya *et al.* [45] which included 583 neck dissections and had both node positive and negative necks.

## Conclusion

During the follow-up, there was a substantial correlation between the size of the primary tumor and the number of distant metastases.

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## Author's Contribution

Not available

## Conflict of Interest

Not available

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