

Original Article

Patterns of Neck Node Metastasis in Carcinoma of Oral Cavity

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Abstract:

Objectives: To find out the patterns of cervical lymph node metastasis in oral cavity carcinoma.

Methods: This is across sectional study which was carried out in the department of Otolaryngology & Head Neck Surgery Dhaka Medical College Hospital (DMCH), Sir Salimullah Medical College Hospital (SSMC), Bangabandhu Sheikh Mujib Medical University (BSMMU) and National Institute of Cancer Research & Hospital (NICRH) from July 2013 to December 2014. Total 96 cases were included in this study. Data were collected by detail history, clinical examination, relevant investigation and result were processed manually and analyzed with the help of SPSS.

Results: In this study 72 (75%) patients presented with clinically palpable neck nodes and 24 (25%) presented without neck node. Among 24 cases 7 cases was radiologically positive neck node. Out of 96 cases stage III was the highest (50.96%) followed by stage IV (27.01%), stage II (13.52%) and stage I (8.32%). That is 23 (23.92%) patients present with early stage and 73 (76.18%) patients present in late or advanced stage. Level I was the highest 49 (61.71%), followed by level all 35(44.1%), level III 10 (12.6%).

Conclusion: As cervical lymph node metastasis is a critical event for patients with squamous cell carcinoma of oral cavity, as this is the most reliable predictor of poor treatment outcomes. Thus for appropriate treatment it is very important to know this pattern of metastases.

Key words: Carcinoma oral cavity, neck node metastasis. Squamous cell carcinoma

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Introduction:

Oral carcinoma is the sixth most common cancer in the world and is largely preventable. It accounts for approximately 4% of all cancer and 2% of all cancer death worldwide. In certain countries, such as Sri Lanka, India, Pakistan and Bangladesh, oral cancer is one of the most common types of malignancy.¹

The high incidence rate in these countries may relate to specific oral habits such as tobacco and chewing Betal nut, pan and areca. By contrast, the use of pan (arecanut and tobacco leaves soaked in an alkali solution) is significantly associated with development of oral cancer.²

Most common site of oral cavity carcinoma is buccal mucosa and oral tongue. Other sites are lips, gums, palate, and retromolar trigone¹. Oral cavity has abundant blood supply and lymphatic drainage hence chances of cervical metastasis are very high. These tumors have an aggressive biological behavior at initial stages with early regional metastasis and causes death.³ The incidence of occult lymph node metastasis in early stage tumor (T1/T2) has been reported to be between 27% and 40%. Extra capsular invasion was identified as important predictor of regional recurrence, distant metastasis, and thus overall survival. The presence of metastases in a lymph node is said to reduce the five year survival rate by about 50%. Bad prognosis is expected in patient with ipsilateral, contra lateral or bilateral nodal involvement. The worst is bilateral then contra lateral, then ipsilateral. The size of nodal involvement is a very important determinant. A conventional biopsy is the best and most accurate means of assessing a suspicious oral lesion.⁴ For evaluation of metastatic disease (metastatic neck node), fine needle aspiration cytology (FNAC) technique is the least invasive pathological examination method, remains the standard for evaluation of a neck mass.⁵

Both computed tomography (CT) scan and magnetic resonance imaging (MRI) are used in determining the regional lymph node status. However CT remains the most widely used modality for neck imaging.⁶ CT has nearly a 100% sensitivity and thus diverse its role as the imaging gold standard in identifying metastasis in the neck.⁷

The primary goal of treatment of oral cavity carcinoma is to control the local disease, eliminate the neck node metastasis, and prevent distant metastasis. About half of the

patients with oral cavity carcinoma had pathologically positive lymph nodes metastases at the time of diagnosis. Therefore, the treatment of a clinically node positive (cN+) neck is very important in the management of oral carcinoma.⁸

So, the present study has been planned with the intention to find out the patterns of neck node metastasis of oral carcinoma patient, which will be beneficial for the otolaryngologist and head neck surgeons of tomorrow, in predicting the prognosis of diseases, choice of appropriate treatment modalities and its prevention of further progression.

Objectives:

To find out the patterns of cervical lymph node metastasis in oral cavity carcinoma.

Methods:

This Cross-sectional study was carried out in the department of Otolaryngology & Head Neck Surgery Dhaka Medical College Hospital (DMCH), Sir Salimullah Medical College Hospital (SSMCH), Bangabandhu Sheikh Mujib Medical University (BSMMU) and National Institute of Cancer Research & Hospital (NICRH) from July 2013 to December 2014. 96 patients were diagnosed as a case of oral carcinoma during the study period and who fulfill the inclusion and exclusion criteria. After taking informed written consent data were collected in a structured questionnaire which included all the relevant information.

Data were processed manually and analyzed with the help of SPSS (Statistical package for social sciences) 16.0 for windows. Qualitative data were presented as frequency and percentage; and comparison was carried out between two groups by Chi-square (χ^2) or Fisher Exact test where

necessary. A probability value (p) of less than 0.05 was considered statistically significant.

Inclusion criteria:

- Patients who were histologically proven oral carcinoma
- Only squamous cell carcinoma of oral cavity were included
- Those who had willfully participated in the present study.

Exclusion criteria:

- Patients who refused to take part in this study
- Extensive oral carcinoma involving other sites where primary site cannot be assessed.

Results:

Table I :
Age distribution of patients (n=96)

Age Groups (years)	No. of Patients	Percentage (%)
31-40	4	4.16%
41-50	30	31.25%
51-60	45	46.80%
61-70	12	12.50%
>70	5	5.21%
Total	96	100%

Table II :
Sex distribution of patient (n =96)

Sex	No. of Patients	Percentage (%)
Male	58	60.42%
Female	38	39.58%
Total	96	100%

Table III :
Topographical distribution of oral carcinoma patients (n=96)

Site of involve	No. of patients	Percentage (%)
Buccal mucosa	35	36.40%
Oral tongue	25	26.00%
Floor of mouth	12	12.43%
Gingiva	9	9.36%
Lip	8	8.32%
Retromolar trigone	5	5.20%
Hard palate	2	2.08%
Total	96	100%

Table IV :
Distribution of patients by cervical lymph node metastases (n=96).

Lymph node status	No. of patients	Percentage (%)
N0	24	25.12%
N+	72	74.88%
Total	96	100%

Table V :
Distribution of patients by level of cervical lymph node involvement (n=96)

Level of lymph node	No. of patients	Percentage (%)
Level I a	5	11.34%
Level I b	44	50.40%
Level II	36	44.10%
Level III	11	12.60%

Table VI :*Level of neck node metastasis of oral carcinoma at different site of oral cavity (n=79).*

Node	Buccal mucosa	Oral Tongue	Floor of mouth	Gingival	Lip	Retromolar trigone	Hard palate	Total
Level I	20	6	5	2	4	0	0	37
Level II	7	8	2	2	2	2	1	24
Level III	0	3	1	1	0	1	0	6
Level IV	0	0	0	0	0	0	0	0
Level V	0	0	0	0	0	0	0	0
Level I & II	3	1	1	0	1	0	1	7
Level II & III	0	1	1	1		0	0	3
Level I, II & III	0	1	0			1	0	2
Total	30	20	10	6	7	4	2	79

Table VII :*Neck node status in oral carcinoma at different sites of oral cavity (n= 96).*

Site	N0	N1	N2	N3	Total
Buccal mucosa	8	17	8	2	35
Oral tongue	5	10	8	2	25
Floor of mouth	2	7	2	1	12
Gingival	1	5	2	1	9
Lip	1	5	2	0	8
Retromolar trigone	0	3	1	1	5
Hard palate	0	2	0	0	2
Total	17	49	23	7	96

Discussion :

In this study the age of the patients ranges from 37 to 74 years with mean age of 53 (SD±8.61) years. The peak incidence was sixth decade of life. This result was compared with another study which show the age range between 30 to 80 years with a mean of 55 years and peak incidence in fifth and sixth decade.⁹ Out of 96 cases, 58 (60.42%) cases were male and 38 (39.58%) cases were female with a male to female ratio 1.52:1. That was also reported by Sundar et al who found 60.36% male and 39.6% female and male female ratio 1.55:1¹⁰

Buccal mucosa (cheek) was the most common site of intra oral carcinoma, which accounts 35 (38.15%), then oral tongue 25 (27.25%), floor of the mouth 12 (12.48%), gingiva 9 (9.36%), lip 8 (8.32%), retromolar area 5 (5.2%) and hard palate 2 (2.08%). This was similar to other study who found 41% patients suffering from carcinoma of buccal mucosa which was the most common site.¹¹ For carcinoma of oral cavity according to western literature found that tongue is the most common site which accounts for around 40%, floor of the mouth was the second most intra oral lesion.

At the time of presentation, majority of the patients had T3 lesion 49 (50.55%), followed by T4 26 (27.04%), T2 13 (13.52%) and T1 8 (8.12%). Stage I consist of 10 (10.40%), stage II 13 (13.52%), stage III 52 (51.23%) and stage IV 21 (21.94%). Therefore 73 (75.92%) were in advanced stage and 23 (24.04%) in early stage. In study conducted by Shah et al revealed that stage I 19% stage II 29%, stage III 36%, stage IV 16%. That is advanced stage 52% and early stage 48%.¹²The overall highest cervical lymph node metastasis was found in T4 lesion (79%) then in T3 lesion which was 60%. There was significant association between tumor stage and nodal metastasis.

In the current study 72 (74.88%) patient had ipsilateral cervical lymphadenopathy at the time of presentation, 27 (25.12%) were no clinically palpable lymph node. But among 27 cases 7 cases (25.9%) found that they are in occult lymph node which was proved by CT scan of neck. Jerjes et al state that the incidence of occult lymph node metastasis in early stage tumors (T1&T2) has been reported to be between 27- 40, which is similar to this study.¹³

Among 72 cases of palpable nodes there were 21 (29.19%) N1, 42 (58.58%) N2, and 9 (12.51%) N3. Renukananda et al found N1 30%, N2 61%, N3 9%. Neville and Day state that 66% of patient with primary oral carcinoma had cervical metastasis at the time of diagnosis and metastasis most frequently developed in the ipsilateral nodes.^{4,9} Many other studies have also reported cervical lymphadenopathy of oral carcinoma patients at the time of presentation. In this study evaluation of neck nodes were done by FNAC which was positive in 79 (78.48%) patients and it is the least invasive pathologic method, remain the standard for evaluation. Study by Ayaz et al state that ultrasound guided FNAC was the

best way for evaluation of lymph node involvement and it is 100% sensitivity in oral SCC.¹⁴

In our study we found that In early stage out of 23 patients 14 patients were neck node positive where as in advance stage 65 patients were neck node positive. There is significant association between the tumor stage and nodal metastasis.

Among 72 cases of palpable nodes there were 21 (29.19%) N1, 42 (58.58%) N2, and 9 (12.51%) N3. This observation was similar to other study that found N1 30%, N2 61%, N3 9%. (12.) In present study the incidence of nodal metastasis at the time of presentation was much more than other studies due to factors like high illiteracy rate, ignorance about the disease, poor referral system and limited screening in our country.

Squamous cell carcinoma of the oral cavity, the majority of metastasis lymph nodes were at levels I, II and III. Among cervical nodal metastases of oral carcinoma patient (n=79), level I was the highest that was 37 patients followed by level II 24 patients, level I&II 7, level III 6, level II&III 3, level I, II&II was only 1 patient. Overall in level I was the most frequently involved lymph node which was 46 (57.96%) followed by level II 36 (45.36%) and level III 11 (13.86%) and level IV and beyond involvement was not observed. Also bilateral and contra lateral involvement was not observed. In this study I found that buccal mucosa, floor of mouth, gingiva and lip commonly metastasis in level I but oral tongue, retromolar trigone and hard palate metastasis in level II. This result was also supported by Mohan et al who found that carcinoma of floor of mouth 70% of cases metastasis in level I. Other study found that in carcinoma buccal mucosa neck node metastasis in level I was about 100% followed by level II 83%.¹⁵ In oral tongue carcinoma metastatic lymph node was

observed in level I (50%) and level II (75%).(14) .Shah et al also state that level I was the most frequently involved in all the subsite of oral cavity except tongue retromolar trigone and another study by Haq et al found that most common region were level I.^{3,12}

Conclusion:

To find out the patterns of cervical metastasis in oral cavity carcinoma within a short period of time, 96 patients with oral carcinoma were enrolled in the study. The study revealed cervical nodal metastases to level I were more common in oral carcinoma. Most of the patients had nodal metastases at the time of diagnosis; this is primarily due to late stage of the disease process, aggressiveness of the disease, propensity to cervical metastases of oral carcinoma. Ignorance, lack of proper education, personal habits, Pan (betel nut), and tobacco chewing and lack of medical facilities and poor referral system are the common factors for aggressiveness of the disease. Cervical lymph node metastasis is a critical event for patients with squamous cell carcinoma of oral cavity, as this is the most reliable predictor of poor treatment outcomes. Thus for appropriate treatment it is very important to know this pattern of metastases. And to achieve a more accurate result, multicentre and large scale study with a larger time frame along with more logistic support is required.

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