

Research article

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Incidence of Occult Metastasis in Oral Tongue Squamous Cell Carcinoma

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Abstract

Introduction: In Vietnam in general and at the Ho Chi Minh City Oncology Hospital in particular, there is still no study evaluating the role of prophylactic neck dissection in the management of oral tongue cancer and evaluating the characteristics of the occult nodal metastases in patients with squamous carcinoma of the oral tongue, predisposing factors.

Objectives: 1. To estimate the rate of occult nodal metastases in patients with squamous carcinoma of the oral tongue in oral tongue cancer patients with clinical negative lymph nodes. 2. To investigate the relationship between some clinicopathologic factors and the occult cervical nodal metastases in patients with oral tongue cancer.

Materials and Methods: Descriptive retrospective study

Result: In this study, the proportion of metastases to particular levels was the following: 20%-I, 80%-II, 20%-III, 6.6% in IV and with total patient the proportion of metastases was the following: 4,8%-I, 19,4%-II, 4,8%-III, 19,6% in IV. The proportion of occult metastasis was 24.2%. On multivariate analysis, WPOI-5 was an independent prognostic factor. Clinical and histological parameters such as DOI on CT, histological grade, and DOI on pathology also showed significant correlation with risk of LN metastasis, but are not strong enough to be independent prognostic factor. The DOI values measured on CT as well as on the gross pathology have a strong correlation with the DOI value on pathology.

Conclusion: The proportion of occult metastasis was 24.2%, the proportion of metastases in levels I, II, III, IV was 20%, 80%, 20%, 6.6%, respectively. Clinical and histological parameters showed significant correlation with risk of LN metastasis are DOI on CT, histological grade, DOI on pathology, WPOI-5 (independent prognostic factor). DOI on CT and DOI on gross pathology are strongly correlated with DOI on pathology.

Key words: Depth of invasion, perineural invasion, lymphovascular invasion, worst patterns of invasion, occult cervical lymph node metastasis

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1. INTRODUCTION

Clinical examination and imaging are used to assess the necks of patients with oral tongue cancer before treatment and during follow-up. But cervical lymph node metastasis staged by clinical examination and imaging has been demonstrated to be inaccurate in several cases.

The incidence of occult metastasis in neck lymph nodes in patients of oral tongue squamous cell carcinoma (SCC) ranges from 23,7 - 29,9%[10]

The clinically node-negative (cN0) neck in early-stage oral tongue squamous cell carcinoma can be managed with observation, elective neck dissection (END) or sentinel lymph node biopsy

(SNLB)[5], [8], [12], [18], [19], [21]. SNLB is used in patient who have already been diagnosed with early oral cancer and with low depth of invasion (DOI) [1], [6]. Elective node dissection resulted in an improved rate of overall survival as compared with watchful-waiting [21].

However, neck dissection is associated with an increased risk of hypertrophic scar, stiff neck and injured marginal mandibular branch [3], [15]. When we can identify neck lymph node characteristics in patients with oral tongue cancer, we can select the treatment of patients with cN0 neck in early-stage.

In Vietnam in general and at the Ho Chi Minh City Oncology Hospital in particular, there is still no study evaluating the role of prophylactic neck dissection in the management of oral tongue cancer and evaluating the characteristics of the occult nodal metastases in patients with squamous carcinoma of the oral tongue, predisposing factors. This study aim to estimate the rate of occult nodal metastases in patients with squamous carcinoma of the oral tongue in oral tongue cancer patients with clinical negative lymph nodes and to investigate the relationship between some clinicopathologic factors and the occult cervical nodal metastases in patients with oral tongue cancer

Materials and methods

This retrospective study was carried out in the Department of Maxillofacial and Head and Neck Surgery, Hospital, Ho Chi Minh city, Vietnam, from 2019 to 2021. Patients having oral tongue squamous cell cancer with clinically and radiologically (computerized tomography [CT]/ultrasound) N0 neck and T stage T1,T2, T3, who underwent surgery as the primary mode of treatment between September 2019 to January 2021, were enrolled in this study. All patients underwent clinical examination, ultrasound and contrast-enhanced CT scanning before the initial treatment. The tumor, node, metastasis classification and clinical stage were determined according to the criteria established by the American Joint Committee on Cancer and the International Union Against Cancer.

All patients underwent wide local excision of the primary tumor along with unilateral extended supraomohyoid neck dissection (Level

I, II, III, IV). In this study, demographic factors (age, gender, substance abuse), clinical factors (tumor site, stage), radiological factor (DOI) and pathological factors (histological grade, DOI, Lymphovascular space invasion (LSVI), Perineural invasion (PNI), Worst patterns of invasion (WPOI-5), number of metastasis node) were analyzed.

The result of clinical examination, radiological imaging was compared with histopathological results of neck dissection and primary tumor specimen; the presence and absence of metastatic lymph nodes, their number, size, and level in the neck were noted. Positive nodes were correlated with the grading, differentiation, DOI, PNI, LSVI, WPOI-5 of the primary tumor.

Correlation analyses were made between occult metastasis and the variables studied by the Chi-square test. The variables were also analyzed in SPSS version 20.0 software (open source statistical analysis software, PSF, USA). Values of P < 0.05 were considered statistically significant.

Results

Characteristics	Total (%)
T- stage	
T1	5 (8,1%)
T2	39 (62,9%)
T3	18 (29%)
Grade	
Grade 1	31 (51%)
Grade 2	28 (45,2%)
Grade 3	3 (4,8%)
Pathological DOI	
≤ 4 mm	7 (11,3%)
> 4 mm	55 (88,7%)
LSVI	
Present	6 (9,7%)
Absent	56 (90,3%)
PNI	
Present	20 (32,3%)
Absent	42 (67,7%)
WPOI-5	
Present	18 (29%)
Absent	44 (71%)

Table 1: Clinical and histological characteristic of 62 patients with oral squamous cell carcinoma

There were 44 males and 18 females; the median age of the patients was 53 (range: 22-76) underwent resection of the primary tumor with extended supraomohyoid neck dissection for N0 lymph node status of neck. Tables 1 and 2 show the distribution of clinical and histological characteristics of the patients.

A total of 1262 lymph nodes were analyzed in this study. Occult metastasis was found in 15 patients (24.2%). The relationship of occult metastasis with Clinical and histological characteristics of tumor is depicted in Table 2. CT-DOI, Pathological-DOI, Grade, WPOI-5 (independent prognostic factor) were found to be a statistically significant predictor of occult lymph node metastasis in a cN0 neck.

	Occult present	Occult absent	p
Age			
≤ 40	1	11	0,153
> 40	14	36	
Location			
Lateral border	13	39	0,735
Ventral surface	2	8	
Size			
≤ 2 cm	5	22	0,628
> 2 - ≤ 4 cm	8	21	
> 4cm	2	4	
Stage			
T1	1	4	0,561
T2	8	31	
T3	6	12	
CT-DOI			
≤ 7 mm	1	17	0,028
> 7 mm	14	30	
Pathological DOI			
≤ 7 mm	1	18	0,021
> 7 mm	14	29	
Grade			
Grade 1	7	24	0,77
Grade 2-3	8	23	
LSVI			
Present	3	3	0,12
Absent	12	44	

	Occult present	Occult absent	p
PNI			
Present	7	13	0,17
Absent	8	34	
WPOI-5			
Present	10	8	<0,001
Absent	5	39	

Table 2: Characteristics of occult neck metastasis-positive and metastasis-negative patients

CT-DOI correlated with pathological DOI, as shown in Fig.1 (correlation coefficient = 0.788, p < 0.001).

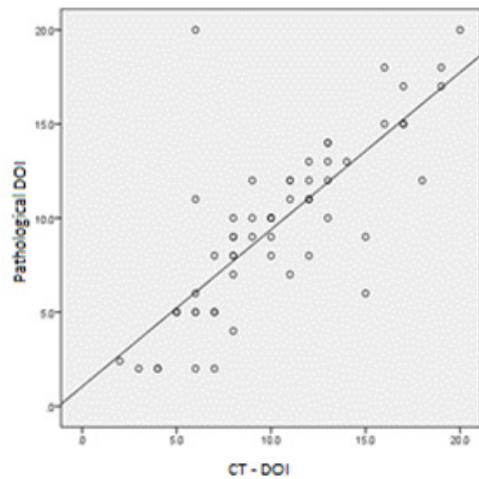


Fig.1: Correlation between pathological-DOI and CT-DOI

Gross pathological DOI strongly correlated with pathological DOI, as shown in Fig. 2 (correlation coefficient = 0.746, p < 0.001)

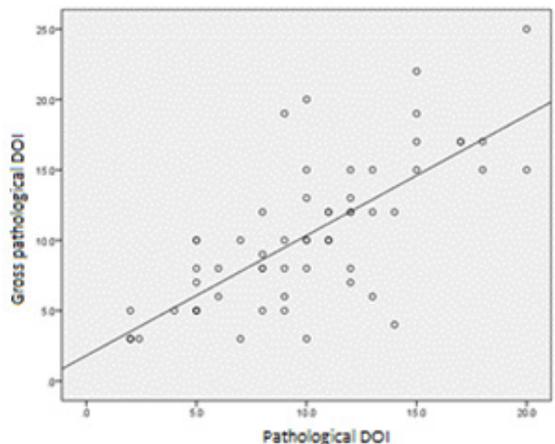


Fig.2: Correlation between gross pathological - DOI and pathological-DOI

2. DISCUSSION

Controversy exists over management of the neck in patients with cN0 oral SCC. Various authors have studied this dilemma and come to different conclusions regarding the approach to the cN0 neck. While Chaudhary et al [20] in a study of 112 patients found the incidence of occult metastasis in cT2-4N0 tumors to be 23,12%; Keski - Santti et al [13] in a similar study of 80 patients found the incidence to be 34%. Contradictions are seen from studies by Capote et al [4] who found occult metastasis occurring in 0% cases. Based on these findings, the authors have recommended management ranging from observation of patient to managing the disease by END. These contrasting recommendations have stimulated the search for various predictors of occult metastases to identify those who might benefit most from END. The incidence of occult metastasis in our study was found to be 24.2%. This is in keeping with similar studies from around the globe. [7], [9], [14], [16]

We found that as the grade of N0 oral tongue SCC increases, the incidence of occult metastasis also increases (from 17,9% in Grade 2 to 100% in grade 3). Similar increase in incidence was also found with increase in CT-DOI, pathological-DOI. In our study, the statistically significant predictive indicator for occult metastasis was found to be CT-DOI, Pathological-DOI, grade and WPOI-5 (independent prognostic factor). Other authors have studied different promising factors that may help us to predict nodal metastasis in N0 neck. Sahoo et al [17] found LSVI to be a significant predictor of metastasis. Jardim et al [11] found PNI also to be a significant predictor of metastasis.

It is evident that there is no consistent statistically significant factor that can be attributed as a predictor of occult metastasis in head and neck cancer of the oral cavity. Advances in imaging technology, use of biomarkers, and the role of sentinel node biopsy require further research and validation. Therefore, the search to identify reliable and accurate predictor(s) of occult metastases or approaches to the management of patients with cN0 oral SCC must continue. In the absence of such predictors, keeping the high incidence of

occult metastasis in mind, we recommend END in all cases of N0 OSCC.

The current study compared DOIs measured on CT and gross pathological DOI with pathological DOI, in the same individuals, to ascertain the usefulness of CT and gross pathological DOI for estimating pathological DOI. The results revealed the superiority of using CT for pretreatment evaluation of radiological DOI, as compared to gross pathological, in OTSCC, as the correlation coefficient between CT-DOI and pathological DOI was greater than that between gross pathological DOI and pathological DOI. The correlation between DOI on CT and pathological DOI (correlation coefficient = 0.74, $p < 0.001$) was reported [2]. Our study results also showed a significant correlation between pathological DOI and CT-DOI (correlation coefficient = 0.788, $p < 0.001$).

This study includes 62 patients. A larger sample size would enable better understanding of the association. Patients must continue to be managed by multidisciplinary teams until more suitable predictors or new approaches have been identified. Sentinel lymph node biopsy and advances in research into biomarkers may have an invaluable role in their future management.

3. CONCLUSION

Our study showed a strong correlation between CT-DOI and pathological DOI. Patients with cN0 oral tongue SCC and a positive WPOI-5, CT-DOI, and pathological DOI larger than 7 mm had a high risk of developing neck metastasis. We suggest prophylactic neck dissection in these patients.

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