

Original Research Article

Comparison of CT scan and intraoperative findings of cervical lymph node metastasis in oral squamous cell carcinoma with post-operative histopathology

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Received: 10 January 2021

Revised: 08 May 2021

Accepted: 10 May 2021

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ABSTRACT

Background: In oral cancer are 90% are squamous cell carcinomas (SCC) and lymphatic metastasis influences prognosis. With help of contrast CT scan finding done preoperatively and intraoperative finding during neck dissection we tried to generate a scoring system by which we can predict cervical lymph nodes metastasis systematically.

Methods: Biopsy proven oral SCC cases underwent surgery between May 2012 to December 2018. Contrast enhanced computerized tomography (CECT) neck, intraoperative finding and post operative HPR (histopathology) were compared for the largest size node in the neck. Sensitivity, specificity, PPV, NPV and accuracy were calculated by using the hpr findings in the neck dissection specimen as control. Out of 68 cases, supraomohyoid neck dissection was done in 16 cases and radical neck dissection in 52 cases. Scores were put in Open Epi screening test software. Best cut off point was calculated using Youden Index.

Results: Best cut off score (using Youden index and ROC curve) for CT scan was >1 out of 7 features (size >10 mm, central necrosis of lymph node, matting of lymph node, shape, extracapsular spread, vascular invasion, central hypodensity). Best cut off for intraoperative palpation was ≥ 3 out of 4 features (size, feel on palpation, adherence to surrounding structure, shape).

Conclusions: Intraoperative findings can change the extent of surgery for being high sensitive and specific as compared to CT scan which is high sensitive but low specificity. A scoring system can be generated preoperative and intraoperatively to predict a node being malignant or not.

Keywords: SCC, CT neck, HPR

INTRODUCTION

Most oral cancers are squamous cell carcinomas because most of the risk factors injure the most superficial layers of the mucosa and gingiva. Oral cancer is the sixth most common cause of cancer related death in the world. The global incidence of cancers of the oral cavity, pharynx account for 363,000 annual new cases worldwide and almost 200,000 deaths. This represents about 6 percent of the incidence and 5 percent of the mortality of all cancers.

About three-fourths of these are cancers of the oral cavity and pharynx and the remaining are laryngeal cancers.¹⁻³

The human body has approximately 800 lymph nodes; about 300 of them are located in the neck.⁴ The presence of cervical lymph node metastasis in patients with head and neck carcinomas leads to poor prognosis. The 5-year survival rate in patients of cervical metastasis has been reported to be 20-36% after surgical treatment as compared to 63-86% in patients with no lymph node involvement. Many investigators have studied clinical and

histopathologic features of the primary tumor, such as size of tumor, degree of differentiation, host immune response and pattern of invasion (PI), to determine the propensity for lymph node metastasis.^{5,6} Histologic grading has been used as a prognostic factor and for clinical behavior evaluation of oral squamous cell carcinoma (OSCC) for the past several decades.⁷

In the treatment of patients with squamous cell carcinoma of the oral cavity, the surgeon aims to cure the patient by removing the diseased tissue. In addition to the size of primary lesion, site, thickness, histological staging and the presence or absence of metastatic spread are all important to formulate a treatment plan.⁹ The presence or absence of nodal metastasis has a great impact on the prognosis and survival of patients with head and neck cancer. Nodal metastasis to one side decreases the survival by 50%, while bilateral metastasis decreases survival by a further 25%.⁸⁻¹¹

Factors that have been shown to increase the risk of cervical metastasis include the site of the primary tumor, tumor thickness, DNA ploidy and tumor growth patterns such as infiltrating margins, perineural spread and angioinvasion. Despite this knowledge it remains difficult to accurately predict the metastatic behavior of these lesions.¹²

Management of the neck in patients with oral SCC is controversial. Some clinicians and surgeons advocate elective treatment of the neck while others do not.⁸ Overlooking metastatic disease may cause failure of the treatment and on the other hand over estimation may lead to unnecessarily excessive treatment. The risk of occult metastasis that is higher than 20% is the most important indication for elective neck treatment. The risk of occult metastasis is related to the method by which the lymph nodes are evaluated. It is possible to reduce the risk of undiagnosed metastasis with accurate imaging techniques and thus probably reduce the number of elective neck treatments.¹³

Preoperative assessment of metastatic status of cervical lymph nodes is a well recognized difficulty in the management of patients with oral cancer.¹⁴ Assessment for the presence of cervical lymph nodes can be carried out by palpation and radiology (USG, CT scan, MRI and PET scan)

Lymphatic metastasis is a frequent event that influences prognosis hence decision to treat the cervical lymph nodes has to be made in all the patients, even if metastasis is not apparent clinically (N0). It is therefore important to assess regional nodal involvement as reliably as possible.

Objectives

To clinically (intraoperative and pre-operative), radiologically (CECT neck) evaluate presence or absence of cervical lymph node metastasis in patients with oral

squamous cell carcinoma. To assess the accuracy of Computed Tomography in assessment of lymph node metastasis pre-operatively. To correlate the findings of Computed tomography and intraoperative finding with post-operative histopathology in patients with oral squamous cell carcinoma. To generate a scoring system using individual feature of malignancy of each pre-operative examination modality and preoperative scoring system for CT scan.

METHODS

Source of data

Patients reporting to Department of Otorhinolaryngology, Dr. S.N. Medical college Jodhpur, Rajasthan, India for the treatment of oral squamous cell carcinoma. It was a prospective and retrospective observational study, including the cases for a period of seven years from May 2012 to December 2019.

Methods of collection of data

The site of primary tumor was lip, buccal mucosa, gingivobuccal sulcus, Retromolar trigone, palate, lower alveolus, tongue and floor of mouth. All the patients were examined clinically and then examination of neck was carried out by CT/ MRI and USG. Intraoperative by the neck was examined for presence of lymph node and the characteristics of lymph node was noted. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated by using the histopathologic findings in the neck dissection specimen as a standard of reference. Findings at these modalities and histopathologic examination were compared for the overall number of nodes in the neck.

Computed tomography

All the patients were examined by CT of neck from the base of the skull to the clavicle. Axial CT sections were taken. Non ionic contrast material about 40 to 50 ml was administered intravenously in all patients.

The criteria used to define a node as metastatic in our study are: lymph nodes greater than 10 mm in size, nodes with central necrosis, regardless of size in the absence of clinical infection, conglomeration of three or more lymph nodes in the drainage region of the primary tumor of nodes regardless of size, evidence of extracapsular spread, evidence of vascular invasion seen on contrast CT, shape, central hypodensity with peripheral rim enhancement.

After considering the findings of clinician and radiologist an assessment was made on nature of lymph node i.e. malignant/non malignant and it was used for comparison with postoperative histopathology report. Then the sensitivity, specificity, positive predictive value, negative predictive value and accuracy of the final assessment and individual features was calculated.

Intraoperative findings

The treatment protocol was decided on the basis of clinical and radiological examination of neck lymph nodes. Supraomohyoid neck dissection was planned in No neck and modified neck dissection was planned for N+ neck. However the final decision about type and extent of neck dissection was taken intraoperatively depending on the presence and nature of lymph nodes, if the intraoperative palpation was suggestive of malignant lymph node than the operative plan was modified accordingly.

The criteria for metastatic lymph node on intraoperative palpation were the same as preoperative palpation. However the accuracy of palpation was increased as the lymph node were palpated directly after exposure. Immediately after resection the specimen was spread out and labeled as level I- V according to the Memorial Sloan-Kettering classification and fixed in 10% formaldehyde solution. Subsequently neck dissection specimen was histologically examined as per institutional protocol and the findings of the pathologist were recorded per nodal level. The histological features of the lymph nodes were then compared with the intraoperative findings and CT.

Selection criteria

Inclusion criteria

Patients with histopathologically proven squamous cell carcinoma of oral cavity. Patient requiring surgery with neck dissection as dictated by the metastatic state.

Exclusion criteria

Patients who have undergone radiotherapy and chemotherapy. Patients with inoperable disease that is extensive primary growth or the presence of distant metastasis. Patients with disease of site other than oral cavity. Non squamous cell carcinoma of oral cavity. Patients who did not gave consent for surgeries.

Sample size

The study of Tankred et al was taken as reference study for calculation of minimum sample size. Minimum sample size for this study was calculated to be 40 subjects of oral malignancy at 95% confidence interval and 20% relative allowable error, assuming the sensitivity of USG to be 84% (as per Tankred et al and assuming the prevalence of metastatic LN among oral cancer patients to 49%. 15

Sample size was calculated using the formula

$$N = 4pq \div L^2 \times I \div P$$

where, p=sensitivity of USG (p taken 84)

q = 1 – p (q taken 16)

L = relative allowable error = 20% of p (l taken 20% of 84=16.8)

P = prevalence of metastatic LN among oral cancer patients (P taken 0.49)

Considering 10% drop out and 10% non-response rate sample size was further enhanced and rounded off to 70 subjects of oral cancer.

Calculation of cut off score for each diagnostic modality

We used diagnostic or screening test evaluation module 1.0 from Open Epi. OpenEpi is free and open source software for epidemiologic statistics. It can be run from a web server or downloaded and run without a web connection. A server is not required. (OpenEpi: Open Source Epidemiologic Statistics for Public Health). OpenEpi development was supported in part by a grant from the Bill and Melinda Gates Foundation to Emory University, Rollins School of Public Health.¹⁶

This module helps evaluate the performance of a candidate diagnostic test or screening procedure against a known reference or gold standard. It is assumed that a reference standard (the true diagnosis) exists. The module lets you choose the type of diagnostic test based on the outcome it reports. Then, the module uses pertinent statistics to evaluate the performance of the diagnostic test.

For two or more exposure levels, the program calculates sensitivity, specificity, positive and negative predictive values, diagnostic accuracy, likelihood ratios, diagnostic odds, Cohen's Kappa, entropy reduction, and a bias index.

If more than two levels of results are specified, a plot (ROC curve) showing proportions of true positives versus false positives is produced.

Youden index

By using diagnostic epi software we get Sensitivity, specificity, positive, and negative predictive values, and accuracy rate of each score or each level. But to calculate cut off score we use Youden index. The Youden Index (J), another main summary statistic of the ROC curve used in the interpretation and evaluation of a biomarker, which defines the maximum potential effectiveness of a biomarker. J can be formally defined as $J = \max_c \{Se(c) + Sp(c) - 1\}$. The cut-point that achieves this maximum is referred to as the optimal cut-point (c^*) because it is the cut-point that optimizes the biomarker's differentiating ability when equal weight is given to sensitivity and specificity.¹⁷

ROC curve and area under curve analysis

The ROC curve was first used during World War II for the analysis of radar signals, following the attack on Pearl Harbor in 1941, the United States army began new

research to increase the prediction of correctly detected Japanese aircraft from their radar signals. The plot of True positive rate (t sensitivity) versus False positive rate (1-Specificity) is called receiver operating characteristic (ROC) curve and the area under the curve (AUC), as an effective measure of accuracy. ROC curve corresponding to progressively greater discriminant capacity of diagnostic tests are located progressively closer to the upper left hand corner in "ROC space".

An ROC curve lying on the diagonal line reflects the performance of a diagnostic test that is no better than chance level, i.e. a test which yields the positive or negative results unrelated to the true disease status. The maximum AUC=1 means that the diagnostic test is perfect in the differentiation between the diseased and non diseased. This happens when the distribution of test results for the diseased and non-diseased do not overlap. AUC =0.5 means the chance discrimination that curve located on diagonal line in ROC space. The minimum AUC should be considered a chance level i.e. AUC=0.5 while AUC=0 means test incorrectly classify all subjects with diseased as negative and all subjects with non diseased as positive that is extremely unlikely to happen in clinical practice. The area under an ROC curve (AUC) is a popular measure of the accuracy of a diagnostic test. In general higher AUC values indicate better test performance. The possible values of AUC range from 0.5 (no diagnostic ability) to 1.0 (perfect diagnostic ability).

True positive results are metastasis carrying (positive) nodes detected by any method.

True negative results are unaffected by (negative) nodes demonstrated by any method.

False positive results are unaffected nodes demonstrated as carrying metastasis by any method.

False negative results are metastasis carrying nodes demonstrated as unaffected by any method.

Sensitivity determines how well positive lymph nodes are diagnosed by particular method.

Specificity determines how well positive nodes are distinguished from non affected by particular method.

Accuracy determines how well a method functions.

Positive predictive value determines the probability of a node with a positive diagnostic result being actually positive.

Negative predictive value determines the probability of a node with a negative diagnostic result being actually unaffected.

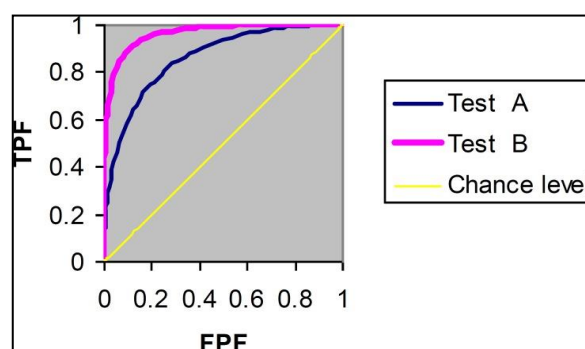


Figure 1: Test B has a greater discriminate capacity than test A.

RESULTS

Our study consisted of 70 patients of biopsy proven Squamous cell carcinoma of oral cavity. Two patients dropped out from our study. The site of primary tumor was: tongue in 29 (42.64%) patients, buccal mucosa in 25 (36.76%) patients, buccogingival sulcus in 8 (11.76%) patients, floor of mouth in 2 (2.9%) patients, lower lip in 2(2.9%) patients, palate in 1 (1.4%) patient and retromolar trigone in 1 (1.4%) patient.

Table 1: Sensitivity, specificity, j score, accuracy, positive, negative predictive and accuracy of CT scan.

Variables	Cut off score of CT (%)						
	1	2	3	4	5	6	7
Sensitivity	92.31	46.15	11.54	3.84	-	-	-
Specificity	42.86	78.57	92.86	100	-	-	-
J score	0.34	0.24	0.04	0.03	-	-	-
PPV	50	57.14	50	100	-	-	-
NPV	90	70.21	62.9	62.69	-	-	-
Accuracy	61.76	66.18	61.76	63.24	-	-	-

CT evaluation of neck for lymph node metastasis

When added score of CT evaluation of all patient were put in Open Epi screening test software and best cut off point was calculated using Youden Index. Cut off for CT was >1

out of 7 features. Cut off was calculated after obtaining sensitivity, specificity of features ranging from 1 to 7 in open Epi diagnostic software for each level and cut off was decided using Youden index (J score maximum). The J score maximum was for score 1 (Table 1).

$J \text{ score} = \text{sensitivity} + \text{specificity} - 1$

In this study out of 68 cases, CT examination showed metastatic features in 48 (70.58%). The distribution of metastasis in neck levels through CT scan evaluation is shown in Table 2.

Table 2: CT scan score and number of cases with respective score on CT scan.

CT scan score	Counts of patients
0	20
1	27
2	15
3	5
4	1
5	0
6	0
7	0
Grand total	68

Table 3: CT score in relation to HPR positivity.

CT score	HPE negative	HPE positive	Grand total
0	18	2	20
1	15	12	27
2	6	9	15
3	3	2	5
4	0	1	1
5	0	0	0
6	0	0	0
7	0	0	0
Grand total	42	26	68

Table 4: Comparison of CT with histopathologic examination.

Investigation	Findings	Histopathologic Examination	
		Positive	Negative
CT	Positive (48)	True Positive (n=24)	False Positive (n=24)
	Negative (20)	False Negative (n=2)	True Negative (n=18)

Examination with CT detected 48 cases (70.58%) had apparently metastatic and 20 patients (29.41%) had reactive lymphadenopathy out of total 68 cases with cut off score >1. (Table 3)

Postoperative histopathologically evaluation revealed the presence of metastatic lymph nodes in 2 (10 %) of 20 patients in whom CT could not detect metastatic lymphadenomegaly i.e. false negative (Table 3). In 24 (50 %) of 48 patients whose CT findings were reported as

metastatic lymphadenopathy, postoperative histopathologic evaluation did not detect evidence of metastatic lymph node i.e. false positive. CT assessments revealed true-positivity (n=24), true-negativity (n=18), false-positivity (n=24), and false-negativity (n=2) of the results in respective number of patients (Table 4).

Table 5: Sensitivity, specificity, J score, accuracy, positive, negative predictive and accuracy of intraoperative palpation.

Variables	Cut off score of intraoperative palpation (%)			
	1	2	3	4
Sensitivity	100	96.15	92.31	34.62
Specificity	50	76.19	92.86	100
J Score	0.50	0.72	0.85	0.34
PPV	55.32	71.43	88.89	100
NPV	100	96.97	95.12	71.19
Accuracy	69.12	83.82	92.65	75

Table 6: Intra operative palpation score and number of cases with respective score.

Intraoperative score	Count of patients
0	21
1	12
2	8
3	18
4	9
Grand total	68

Table 7: Intra operative score in relation to HPR positivity.

Intra operative score	HPE negative	HPE positive	Grand total
0	21	0	21
1	11	1	12
2	7	1	8
3	3	15	18
4	0	9	9
Grand total	42	26	68

In our study the sensitivity, specificity, positive, and negative predictive values, and accuracy rate for CT was estimated to be 92, 42, 50, 90, and 61 %, respectively for cut off score of 1 out of 7 (Table 1).

None of the patient had all the features of metastasis in lymph node on CT.

Intraoperative palpation of Lymph node to detect metastasis

In all cases, the characteristics of lymph node metastasis that were evaluated included: size, consistency, shape, and

adherence to surrounding structures. When added score of all preoperative evaluation of all patient were put in Open Epi screening test software and best cut off point was calculated using Youden Index. Best cut off for intraoperative palpation was >3 out of 4 features (Table 5).

In this study out of 68 cases 27 were positive on intraoperative palpation with cut off score of >3 (Table 6).

Table 8: Comparison of intraoperative palpation with histopathologic examination.

Investigation	Findings	Histopathologic Examination	
		Positive	Negative
Intraoperative palpation	Positive (27)	True Positive (n=24)	False Positive (n=3)
	Negative (41)	False Negative (n=2)	True Negative (n=39)

Postoperative histopathology evaluation revealed the presence of metastatic lymph nodes in 2 (4.80 %) of 41 patients in whom intraoperative palpation could not detect metastatic lymphadenopathy i.e false negative (Table 7). In 3 (11.11%) of 27 patients whose intraoperative palpation findings were reported as metastatic lymphadenopathy, postoperative histopathology evaluation did not detect evidence of metastatic lymph node i.e false positive. Intraoperative palpation assessments revealed true-positivity (n=24), true-negativity (n=39), false-positivity (n=3), and false-negativity (n=2) of the results in respective number of patients (Table 8).

In our study the sensitivity, specificity, positive, and negative predictive values and accuracy rate of intraoperative palpation was 92.31%, 92.86%, 88.89%, 95.12%, and 92.65% respectively for cut off score of 3 out of 4 features (Table 5).

The ROC curve for intraoperative palpation was nearest to upper left corner and hence best predictor of metastatic lymphadenopathy. Also, the area under curve was 0.96 is near the ideal 1 so it can serve as an ideal diagnostic tool for metastasis detection.

DISCUSSION

Detection of cervical lymphadenomegaly in cases with head and neck cancer is the most important factor in the prediction of prognosis of these patients.¹⁸ Therefore, the presence of a cervical lymphadenomegaly has an important impact on the treatment regimen. The presence of a clinically malignant node necessitates more radical treatment of neck in form of modified neck dissection or radical neck dissection while absence of clinically metastatic node supraomohyoid neck dissection may

suffice. Hence pre operative (CT scan) and intraoperative assessment of neck nodes is of paramount importance to an oncosurgeon. Intraoperative frozen section is the gold standard but this facility is available only at limited centres so we decided to study the use of intraoperative palpation as a guide to predict the nature of cervical lymph nodes.

CT scan

CT has been used to determine neck metastasis in carcinoma of head and neck since 1981. Criteria for assessing neck lymph nodes vary with many authors. Van den Brekelet al in 1990 proposed the radiologic criteria in CT for assessing cervical metastasis in patients with primary SCC of head and neck.

Contrast uptake pattern observed in CT, is helpful in differentiating between inflammatory, and metastatic lymph nodes. Besides the presence of focal defect, and peripheral contrast enhancement are characteristic findings in favour of malignancy even in normal-sized lymph nodes. Round lymph nodes, lymph node conglomerates, indistinct contours, sizes larger than 10 mm, ring-shape contrast uptake, and focal defects in contrast-enhanced areas and vascular invasion suggest malignancy.¹⁹

In our study when 7 criteria were used in combination, sensitivity, specificity, positive, and negative predictive values, and accuracy rate for CT were estimated as 92, 42, 50, 90, and 61%, respectively for cut off score of 1 out of 7.

Righi et al reported sensitivity, specificity, positive, and negative predictive values, and accuracy rate of CT as 60, 100, 100, 85, and 87%, respectively.⁸ In study of Bhau et al the overall sensitivity and specificity of computed tomography 82.14% and 91.11% respectively.²⁰

In 1990 Michiel et al undertook a study to estimate the accuracy of different radiologic criteria used to detect cervical lymph node metastasis in patients with head and neck SCC. These criteria had a sensitivity of 87%, specificity of 94, and negative predictive value of 86% and positive predictive value of 94%.²¹

A study by Saravanan et al in 2002 got a sensitivity of 95.65%, specificity of 66.65% and accuracy of 92.30%. In their study the conglomeration and central necrosis had a sensitivity and specificity of 100% thus increasing the accuracy of CT. But in our study none of the cases showed conglomeration or necrosis. So this indicates rim enhancement and necrosis are the highly specific indicators of metastasis. Though necrosis is a reliable criterion, it is unfortunately quite rare in small nodes. Although very small irregularities in contrast enhancement are present in many lymph nodes, it is very difficult to distinguish these small irregularities from artifacts or anatomic irregularities. So size of nodes plays an important role in assessing their nature.

CT is capable of imaging the neck in any plane. Resolution and depiction of tissues in deeper planes is superior in CT. CT can show the primary tumor with its local extensions and documentation is possible. The computed tomography not only diagnosed metastatic lymph nodes but it also gave the extent of primary tumour and distant metastasis. Although computed tomography in this study, had high sensitivity but it had disadvantage of high cost, radiation exposure, risk of anaphylaxis due to intravenous contrast and it can't be repeated every time. It is an invasive technique due to injection of contrast. The older people may find it difficult to lay down for longer time.^{22,23}

Intraoperative palpation

It is common practice for head and neck surgeon to evaluate lymph node by direct palpation and inspection intraoperatively though intraoperative work up by frozen section will be a better predictor of metastasis.

In all cases, the characteristics of lymph node metastasis that were evaluated included: size, consistency, shape, and adherence to surrounding structures.²⁴ Lymph node enlargement was defined as maximum diameter of >1 cm. Consistency of lymph nodes was judged by palpation of the individual lymph nodes with the tips of the fingers and was classified as hard or soft consistency. Shape of lymph nodes was defined into flat and round shape. Judgement of lymph node adherence was determined by rolling the lymph nodes over the underlying structures. Consistency, shape, and adherence of lymph nodes were judged by individual surgeon. In addition, the overall impression on the basis of these 4 characteristics as to whether the lymph nodes were involved and final clinical impression for lymph node metastasis were recorded.

In study of Nasr et al while performing selective neck dissection (170 neck dissection) in 125 patients included in our study, intraoperative assessment of lymph nodes and postoperative histopathological assessment were done.²⁵ The sensitivity, specificity, positive, and negative predictive values and accuracy rate of intraoperative palpation were calculated as 71.85% 100% 100% 88.39% 91.2% respectively.

In study of Finn et al Sixty palpable nodes were identified in 32 neck dissections. They were clinically categorized as malignant or suspect (22) or benign (38). Pathological examination revealed a false-positive rate of 30% and a false-negative rate of 44%. The sensitivity of intraoperative lymph node assessment was 56%, and the specificity was 70%.²⁶

In prospective study of Rassekh et al study of 108 necks in 79 patients examined the role of intraoperative palpation and inspection in improving the surgeon's ability to predict nodal stage. Of 62 patients with No necks clinically on both sides, 26 were staged N+ by intraoperative node examination. Nineteen of the 26 were histologically negative (73% false-positive). Of the 36 patients staged

intraoperatively as No, 10 were histologically positive (28% false-negative). Of 108 necks judged clinically to be No, 25 (23%) had occult metastases and 11 (10%) had extracapsular spread. Forty-one of 108 clinical No necks were believed to have positive nodes at the time of neck dissection. Of these 41 necks, 30 (73%) were found to be histologically No (false-positive). Of the 67 clinical No necks that were also believed to be No intraoperatively, occult metastases were found in 14 (21% false-negative). Therefore, intraoperative staging did not significantly improve the false-negative rate.²⁷

In our study when all criteria were used for intraoperative palpation the sensitivity, specificity, positive, and negative predictive values and accuracy rate of intraoperative palpation were calculated as 92.31%, 92.86%, 88.89%, 95.12%, and 92.65% respectively for cut off score of 3 out of 4 features.

Our intraoperative finding shows substantial difference in sensitivity to other studies but our result were similar in specificity, positive predictive value and accuracy.

We believe intraoperative palpation can be an asset in detection of metastasis in cervical lymph node and change of management during surgery.

Limitation

CT scan reports were evaluated by radiologist which can give rise to interobserver difference in assessment of findings. Our result depends on precision of radiologist skill and his or her knowledge.

CONCLUSION

In our study when 7 features of CT studied for metastasis in lymph node it turn out that > 1 score is the cut off of best prediction of metastasis in cervical lymph node in oral cavity squamous cell carcinoma. When 4 features of malignancy in intraoperative palpation were used to access metastasis in cervical lymph node it turns out that >3 score if the cut off score to detect metastasis. So a scoring system is generated for cervical lymph nodes metastasis in oral cavity squamous cell carcinoma with score 1/7 for ct scan and 3/4 for intraoperative finding as cut off for metastasis. We also concluded that along with routine clinical examination of the neck and pre operative investigation (CT neck) intraoperative palpation in neck can also change the course of surgery from supraomohyoid neck dissection to extended supraomohyoid neck dissection and from extended sohnd to modified neck dissection.

ACKNOWLEDGEMENTS

Dr Navneet Agarwal Professor in ENT Department jodhpur was constant support and motivation during my study. Dr. Manoj Kumar Verma Assistant Professor, Department of Community Medicine, Jodhpur was backbone in my study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sharma R, Agarwal N. Comparison of CT scan and intraoperative findings of cervical lymph node metastasis in oral squamous cell carcinoma with post-operative histopathology. *Int J Otorhinolaryngol Head Neck Surg* 2021;7:950-8.