### **Original Research Article**

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## Neck dissection in node negative oral malignancies: is it justified

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#### **ABSTRACT**

**Background:** Oral cancer is one of the ten most common cancers in world, prevalence being highest in India. The objective of the study was to decide whether it is justifiable to do neck dissection in every case of oral malignancy in true negative necks diagnosed by investigative modalities and to decide whether we can avoid unnecessary block dissection in patient of oral malignancy with negative necks diagnosed by investigation.

**Methods:** It was proposed randomized controlled study conducted over period of 2 years including all patients diagnosed of having oral squamous cell carcinoma. Lymph nodes were assessed by clinical examination and ultrasonography (USG). FNAC was done with the help of USG guidance. After thorough evaluation, the patient was subjected for treatment either surgery or radiotherapy and sometimes chemotherapy. After neck dissection, whole block was sent for histopathological examination. Data collected was analysed on various statistical parameters.

**Results:** For clinical examination consistency and fixity is having high reliability than size and shape. On USG central necrosis, ECS, shape and RI were having specificity and accuracy. Sensitivity, specificity and accuracy of USG FNAC is more.

**Conclusions:** USG and USG FNAC are helpful methods in directing further work up in more efficient and cost-effective manner and these help in reaching diagnosis more accurately than the clinical examination alone and thus it is considered second step in evaluation of neck only after clinical examination.

Keywords: Clinical examination, FNAC, Neck nodes, Oral malignancy, USG

### INTRODUCTION

Oral cancer is one of the ten most common cancers in world, prevalence being highest in India. Incidence rates are quiet high in India with crude rate for males being 9.7 and 6.1 for females. More than 90% of tumors in head and neck region are squamous cell carcinoma.

The therapy regime of the oral squamous cell carcinoma should be based on careful clinical examination and composite analysis on primary lesion related to size, location and cervical lymph nodes.<sup>3</sup> The most important

prognostic factor in oral cavity cancer is the status of regional lymph node metastasis. Cure rate drops to 50% when regional nodes are involved.<sup>4</sup>

As early as the mid-19th century Chelius noted, "once growth in the mouth has spread to submandibular gland complete removal is impossible". This pessimism of Chelius was challenged by newer approaches in management of regional lymph node metastasis.

At the end of 19th century Henry Butlin reported cure rate of 28% in a series of 102 oral cancer patients. He also proposed and practiced anterior triangle dissection.

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Butlin analysed 200 lingual cancer cases and reported cure rate of 41.5%.

George Crile Sr was the first to champion an anatomically based systemic operation called neck dissection and it remained as the gold standard in the management of the patient with cervical node metastasis.

The cure in early stages and recurrences in late stages of oral malignancy mostly depend on the local wide excision with negative margins and removal of all metastasis regional lymph nodes that is neck dissection; radical, modified or selective. Also, it decides the survival rate and disease-free survival rate.

These neck dissections itself is a major surgical procedure and it along with increase in cost of treatment is having its own morbidity and mortality. This is totally unnecessary for patients who do not have metastasis (true negative necks). So, it is necessary to make correct decision whether it is really needed to do neck dissection or not.

Appropriate management of clinically negative neck is also controversial. Many necks are found to contain tumors following dissection, which was not so apparent on clinical examination. The incidence of false negative clinical examination of neck nodes is greater than 20%.<sup>7-8</sup>

The preoperative assessment of neck nodes has a bearing on the prognosis in oral cancers. Regional lymph node metastasis is the most reliable predictor of treatment outcomes for patients with squamous cell carcinoma of tongue.<sup>9</sup>

There are several methods now-a-days to decide and to differentiate the metastatic nodes along with clinical examination like ultrasound examination, FNAC, CT, MRI, PET scan and intra operative sentinel node biopsy.

Thus, the objective of the study was to decide whether it is justifiable to do neck dissection in every case of oral malignancy in true negative necks diagnosed by investigative modalities and to decide whether we can avoid unnecessary block dissection in patient of oral malignancy with negative necks diagnosed by investigation.

### **METHODS**

It was proposed randomized controlled study conducted over period of 2 years.

All patients diagnosed of having oral squamous cell carcinoma were included in the study. Lymph nodes were assessed by clinical examination for their number, size, shape, consistency and fixity. Then the same patient was evaluated for the neck by using ultrasonography (USG). The detected nodes were assessed level wise for their

size, shape, central necrosis, echogenicity, extracapsular spread, roundness index and hilum.

FNAC was done with the help of USG guidance through the most significant nodes detected either on USG or on clinical examination.

After thorough evaluation, the patient was subjected for treatment either surgery or radiotherapy and sometimes chemotherapy. In patients who were subjected to surgical treatment necks were dissected and the dissection extended to 1 additional level i.e. if nodes are positive for level 3, the nodal dissection extends to level 4 for obtaining peripheral clearance.

After neck dissection, whole block was sent for histopathological examination by fixing in 10% formalin.

Data collected was analysed on various stastical parameters. The stoma by inflating the Fogarty balloon much safer.

### **RESULTS**

In present study, out of total 50 patients, males were 33 (66%) and female patients were 17 (33%). Maximum patients were above 40 years (34%) which correlates with study of Langdon JD.<sup>10</sup> There was no gender variation as far as neck metastasis is considered.

Table 1: Comparison between clinical examination and histopathology.

Clinical / histopathology	Malignant	Benign	total
Malignant	14 (63.63%)	8 (36.36%)	22
Benign	4 (14.28%)	24 (85.71%)	28
Total	18 (36%)	32 (64%)	50

Table 2: Comparison between USG and Histopathology

USG/ histopathology	Malignant	Benign	Total
Malignant	14 (66.66%)	7 (33.33%)	21
Benign	4 (13.79%)	25 (86.24%)	29
Total	18 (36%)	32 (64%)	50

In present study 26 (52%) patients presented with involvement of lower jaw. In 26 patients, 10 (20%) are with only jaw involvement, 11 (22%) were jaw with buccal vestibule involvement and 3 (6%) were jaw with lingual vestibule involvement. Among the rest 24 patients, 6 (12%) were with bilateral involvement of jaw, 3 (6%) with tongue involvement, 1 (2%) with lip, 12 (24%) with buccal mucosa and 2 (4%) upper jaw & palate involvement.

In present study, out of 12 patients of alveolus, 7 (58.3%) were having neck nodes positive. All 3 (100%) patients of jaw malignancy involving floor of mouth had neck metastasis while all 3 cases of tongue malignancy showed no metastasis to neck. Thus, neck node involvement depends on site of lesion.

Table 3: Comparison between USG FNAC and histopathology.

USG FNAC / histopathology	Malignant	Benign	Total
Malignant	14 (73.68%)	5 (26.31%)	19
Benign	4 (12.9%)	27 (87.09%)	31
Total	18	32	50

In 8 (25%) out of 32 patients with grade I malignancy neck node metastasis was present. Whereas in 7 (46.66%) of 15 in grade II and all 3 (100%) of grade III had neck metastasis.

Table 4: Comparison between clinical examination, USG and USG FNAC.

	Clinically	USG	USG FNAC
Sensitivity	77.77%	77.77%	77.77%
Specificity	75%	78.12%	84.37%
Positive predictive value	63.63%	66.66%	73.68%
Negative predictive value	85.71%	86.20%	87.09%
accuracy	76%	78%	82%

Table 5: Comparison of all three modalities with histopathology.

All 3 together / Histopathology	Malignant	Benign	Total
Malignant	13	2	15
Benign	3	19	22
Total	16	21	37

### Reliability of clinical examination of neck nodes

In our study, the enlarged node was considered to be significant if it is more than 1.5 cm size clinically. Similarly using shape, node is considered malignant if round and benign if oval. Depending on consistency hard or cystic nodes were considered malignant while firm nodes to be benign. if node is fixed it is malignant otherwise benign. For these observations, we found that size has highest sensitivity 77% and lowest specificity 15%. Its accuracy is 38%. Whereas fixity has highest specificity 90.6% and 78% accuracy with low sensitivity of 55.5%. sensitivity, specificity and accuracy for shape are 27.7%, 90.62% and 68% respectively. And for consistency are 72.2%, 78.12% and 76%.

This suggests that for an individual criterion as sensitivity increases specificity decreases and vice versa. So, no single criterion is highly reliable depending on which we can decide the palpable node is malignant or benign.

### Reliability of USG neck nodes

Nodes were significantly enlarged if it was more than 1.2 cm for sub mental and submandibular and if more than 1 cm for other region nodes. If detected node was round then malignant and benign if oval. Presence of central necrosis or extra nodal spread indicated malignant node. If hilum is eccentric (distorted) or absent node was considered malignant and if it is central and well maintained then nonmalignant. Roundness index (RI) is ratio of maximum longitudinal diameter to maximum transverse diameter. Depending on this node was considered significant when it is less than 1.5 and non-significant if it is more than 1.5.

By using these criterions, we observed that hilum is having highest sensitivity i.e. 90% and lowest specificity 22.72%. Central necrosis is having highest specificity 96.87% and lowest sensitivity 22.2%. Highest accuracy was found with shape and RI index (72%) in present study shape is having sensitivity, specificity and accuracy of 52.6%, 83.8% and 72 % respectively, while RI is having it 72.2%, 71.8% and 72% respectively.

# Reliability of clinical examination to detect cervical metastasis

Clinically we examined 50 cases and found in 22 cases that neck nodes were suspicious of malignancy out of which 6 were referred to radiotherapy. In remaining 16 cases 8 were positive for malignancy on histopathology while remaining 8 were benign. Considering all 6 cases (FNAC positive) referred to radiotherapy and these 8 positive cases, total 14 cases were true positive, 8 were false positive, 4 were false negative and 24 were true negative.

### Reliability of USG to detect cervical metastasis

On USG, we suspected malignant nodes in 21 cases. Out of which 7 (33.33%) cases were benign on histopathology and in remaining 14 (66.66%) cases necks were positive for malignancy. In 29 cases with nodes suspected to be benign on USG, 4 (13.79%) were malignant on histopathology (false negative) and remaining 25 (86.24%) cases neck was negative for malignancy i.e. true negative.

By using these observations our sensitivity for USG examination is 77.77%, specificity is 78.12%, positive predictive value is 66.66%, negative predictive value is 86.20% and accuracy for USG is 78%.

## Reliability of USG FNAC examination to detect cervical metastasis

In present study 3 cases FNAC failure cases had histopathology negative for malignancy (true negative) while 2 FNAC suspicious cases had histopathology negative (false positive). 6 FNAC positive cases were referred for radiotherapy (true positive) and one FNAC negative case sent for radiotherapy (true negative).

By using these observations our sensitivity for USG FNAC examination is 77.77%, specificity is 84.37%, positive predictive value is 73.68%, negative predictive value is 87.09% and accuracy for USG FNAC is 82%.

#### Comparison of all three modalities

This study depicted that results of USG and USG FNAC are helpful in directing further work up in more efficient manner. It helps in reaching to diagnosis more accurately than palpation alone. Thus, these were considered as a second step in the evaluation of the neck only after clinical examination.

# Comparison of all three modalities combined together with histopathology

In our study, out of 50 cases only in 37 cases we have all 3 criteria either positive or negative.

Thus, when all three criteria were combined together the sensitivity is 81.25%, specificity 90.47%, accuracy 64%, positive predictive value is 86.66% and negative value 9.5%.

### DISCUSSION

Study shows no variation in gender distribution which matches with the study of Woolger and Scott.<sup>11</sup> There is strong relation between tobacco chewing and oral malignancy as per Bharti AR and Dharkar et al, which is also seen in present study 44 out of 50 patients chewed tobacco.<sup>12-13</sup> In our study, buccal and lower jaw malignancies are common than tongue and lip. This matches with the study of Haribhakti et al who observed that oral malignancy is common in buccal mucosa (49%) and lower alveolus (20.6%) than tongue (5.2%) and lip (6.2%) cancers.<sup>14</sup>

Highest neck node metastasis was with malignancies involving floor of mouth. This correlates with the study of Kowalski et al. <sup>15</sup> The rate of tumour metastasis to neck increases as grade of tumour increases. This matches with study by Borges et al and Close LG et al. <sup>16-17</sup>

The roundness index, shape and central necrosis are significant criterion to differentiate benign and malignant nodes. This correlates with study by MW van den Brekel and D'Souza O.<sup>18-19</sup> Observation in this study matches with the study of Manfredi D, Jacobelli et al <sup>20</sup> who stated

that the palpation has false positive rate between 15% and 65%. False negative rates were between 10 % to 15% as seen by Spiro RH et al.<sup>7</sup>

This study results matches with Spiro et al that reported the higher overall accuracy 15% false negative and 19% false positive.<sup>21</sup>

By using these observations our sensitivity for clinical examination was 77.77%, specificity 75%, with accuracy of 76% which matches with findings of Maris Karabouta Friedman et al. <sup>22-23</sup>

Baatenburg RJ, de Jong et al stated that USG as compared to palpation was having high sensitivity i.e. 96.8%, specificity was 32.0% and when combined with FNAC specificity was high (92.9%).<sup>24</sup>

Stuckensen T, Kovacs AF et al concluded that USG is having sensitivity of 84% and specificity of 68% and accuracy of 76%.<sup>25</sup>

From this we concluded that there are obvious variations in sensitivity, specificity and accuracy of USG from study to study as these were subjective findings and varies from examiner to examiner.

In study by Baatenburg RJ et al, that compared USG FNAC with conventional FNAC similar results were seen.<sup>24</sup> In another study M W van den Berkel et al, showed that USG FNAC had accuracy of 89%.<sup>26</sup>

USG and USG FNAC were considered as second step in investigation after clinical examination.

When the results of all three modalities are negative there are likely chances that we will miss the diagnosis.

### **CONCLUSION**

As tobacco chewing is rampant, oral malignancy is also common. Present study showed following conclusions

- 74% population of oral malignancy is above 40 years of age
- The overall rate of neck metastasis in oral malignancy is 36%
- For clinical examination consistency and fixity is having high reliability than size and shape
- On USG central necrosis, ECS, shape and RI were having specificity and accuracy and can be relied upon
- Sensitivity, specificity and accuracy of USG FNAC is more
- On comparing all three modalities sensitivity was same for all the three. Specificity and accuracy was more in USG and USG FNAC as compared to clinical examination with accuracy being highest for USG FNAC.

That USG and USG FNAC are helpful methods in directing further work up in more efficient and cost-effective manner and these help in reaching diagnosis more accurately than the clinical examination alone and thus it is considered second step in evaluation of neck only after clinical examination.

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