

# Comparative analysis of detecting cervical lymph node metastasis with fine needle aspiration cytology

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## Abstract

**Objectives:** We correlated the results of cervical lymph node (LN) status by T-tumor size, N-nodal metastasis, M-distant metastasis (TNM) staging, and fine needle aspiration cytology (FNAC) in oral cancer patients to assess the discrepancy index (DI) between nodal metastasis (N) and FNAC results of cervicofacial LNs. **Materials and Methods:** A total of 63 patients (29 females and 34 males) aged from 30 to 85 years were included in our study. Cervical LN status through TNM staging and FNAC results were matched and DI was calculated. **Results:** DI in case of nodal status was 64.10% and 43.47% for TNMN1 and N2, respectively, indicating that tendency for observation of positive result on FNAC increased from N1 to N2. **Conclusion:** Hence, we suggest that relying solely on clinical examination and routine diagnostic tests like FNAC may not be appropriate and additional diagnostic imaging modalities should be considered.

**Key words:** Carcinoma, cervical lymph node, discrepancy index, metastasis

## INTRODUCTION

Oral squamous cell carcinoma (OSCC) is a common malignant tumor in the head and neck region.<sup>[1]</sup> OSCC constitutes 95% of oral cavity cancers and predominantly spreads to the lymph nodes (LNs) of the neck.<sup>[2]</sup> The presence of positive LNs is a significant adverse prognostic factor for survival.<sup>[3,4]</sup> The rate of metastases to cervical LNs probably reflects the aggressiveness of the primary tumor. Between 10% and 52% of clinical LN negative (cN0) in neck are pathological LN positive (pN+). Due to this high proportion of occult metastases,

radical neck dissection or selective neck dissection are traditionally used for treatment of cN0 as well as clinical LN positive (cN+) in neck. However, the proportion of occult metastases depends on the sensitivity of the initial diagnostic methods employed, example, palpation and imaging.<sup>[5]</sup>

The course of OSCC is unpredictable, but the T-tumor size, N-nodal metastasis, M-distant metastasis (TNM) stage of the primary tumor correlates well with the survival rate. The prognosis is best when the primary tumor is small and there is no evidence of regional LN involvement or distant metastasis. In fact, the 5-year survival rate of persons with early stage oral SCC according to the TNM staging system may reach 80% to 90%, whereas the 5-year survival rate for advanced-stage oral SCC is about 40%.<sup>[6]</sup> Hence, we correlated the results of cervical LNs status by TNM staging with fine needle aspiration cytology (FNAC) in oral cancer patients to assess the discrepancy index (DI).

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## MATERIALS AND METHODS

The study group comprised of 63 patients (29 females and 34 males) aged from 30 to 85 years, who reported to Mahatma Gandhi Postgraduate Institute of Dental Sciences, Puducherry for treatment. Patients with clinically diagnosed oral cancer with enlarged cervicofacial LNs were included in the study. Subjects with other known causes for cervicofacial lymphadenopathy such as oral infection, tuberculosis, sarcoidosis, etc. were excluded from the present study. For every subject, thorough clinical examination was performed, history of any harmful habit such as tobacco chewing, smoking, alcohol consumption, was recorded and the exact location of all lesions were recorded in a case sheet. Panoramic radiograph was also performed to screen bony changes due to carcinomatous lesion. TNM staging<sup>[7]</sup> was also performed for all the study subjects. The following clinical criteria were used for differentiating malignant LNs:

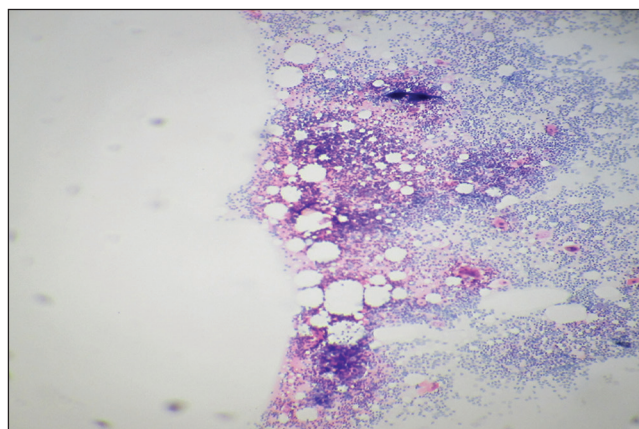
1. LN with approximate size larger than 1 cm in diameter; and
2. LN with hard or indurate consistency.

Following informed written consent from the subjects, FNAC procedure for cervical LN was performed.

Cervical LN status through TNM staging and FNAC results were matched and DI ( $DI = \frac{\text{number of negative results of LN through FNAC}}{\text{number of total patients}} \times 100$ ) was calculated. In addition, the epidemiological parameters were also recorded. The data obtained in the study were subjected to descriptive and analytical statistical analysis.

## RESULTS

In our study subjects, males had higher prevalence of oral cancer in sixth decade or older age group while among female patients prevalence of oral cancer had equal



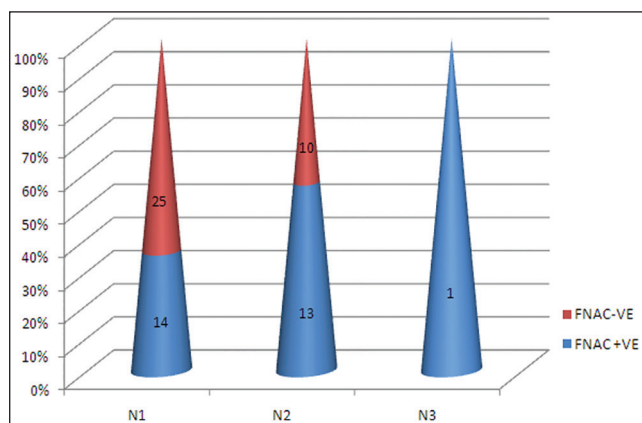
**Figure 1:** Malignant squamous cells detected in the lymph node smear

distribution in sixth and seventh decades. Habit of smoking and chewing tobacco was most common among females and males, respectively. Metastatic malignant squamous cells were detected in the LN smears [Figure 1]. The distribution of cancer patients based on LN staging and FNAC findings are presented in Figure 2. We observed that from N1 to N2 to N3, the tendency for observation of positive result on FNAC increased. DI was observed to be 64.10% ( $=\frac{25}{39} \times 100$ ) and 43.47% ( $=\frac{10}{23} \times 100$ ) for LN status N1 and N2, respectively. It was not feasible to calculate the DI for nodal status N3 as there was only one study sample with nodal status N3.

## DISCUSSION

Cancers of the oral cavity and oropharyngeal region are the sixth most common cancers globally.<sup>[8]</sup> OSCC continues to affect more males than females with a ratio of 1.5:1<sup>[9-11]</sup> which is consistent with our observations in this study. High proportion of cases among males may be due to high prevalence of tobacco consumption habits in them, coupled with smoking whereas in our society females less commonly indulge in tobacco smoking.<sup>[12]</sup> Diagnosis of OSCC is usually at the fifth or sixth decade of life, although there is increase in the trend (~6%) of oral cancer affecting young people under the age of 45 years. In the Asian population, the buccal mucosa is commonly affected due to betel quid/tobacco chewing habits.<sup>[9,12]</sup> In our study, chewing tobacco habit was most prevalent in male patients while smoking tobacco was most common in female patients.

The current TNM classification<sup>[7]</sup> is the widely used system for predicting the clinical prognosis of OSCC. In our study, N1 tumors lacking distant metastasis, showed significant cervical LNs metastasis (35.89%) on FNAC. However, a higher percentage (56.52%) of patients with N2 had shown the cervical LNs metastasis through FNAC. These findings



**Figure 2:** Distribution of oral cancer patients based on lymph node staging and fine needle aspiration cytology results

suggest that the percentage of FNAC results increases with increase of LN status (N2 > N1). The findings of the present study are in accordance with previous report.<sup>[13]</sup> Although the TNM system includes acceptable prognostic parameters however, the biological properties of the tumor cannot be predicted. Hence, the fixity of LNs and the sentinel node biopsy should also be assessed. Fixity of the LN is usually suggestive of malignancy,<sup>[14]</sup> while sentinel node biopsy enhances the chances of detecting the nodal metastasis and improves the accuracy of staging.<sup>[15]</sup>

In our study, DI in case of N1 nodal status patients was 64.10%, which suggests a significant discrepancy between the nodal status of TNM staging and FNAC results of cervical LN metastasis. With similar previous reports,<sup>[16]</sup> it is reasonable to suggest that conventional FNAC technique is unreliable method for detecting cervical LN metastasis, which necessitates use of additional imaging techniques (computed tomography [CT], magnetic resonance [MR] imaging, and ultrasonography) to improve reliability of detecting metastasis. In our study, in case of N2 nodal status patients DI was 43.47%, which is suggestive of increase of sensitivity of method to diagnose cervical LN metastasis with increase of nodal size (N2 > N1) and its correlation with TNM staging.

We also emphasize that deep-seated LNs may be difficult to access using FNAC and can be confused with complex anatomical structures in the head and neck because of the lack of accuracy in needle tip localization and possible risk of injury to surrounding vital tissues. Nevertheless, FNAC can be performed under imaging guidance to improve outcomes.<sup>[17-19]</sup> However, despite its limitations and pitfalls, FNAC appears to be a good first line method for investigating the cases of cervical lymphadenopathy in oral cancer patients because FNAC has proved to be a quick, relatively easy, safe, and repeatable method of obtaining tissue for microscopic examination and allows rapid interpretation of the specimen. This procedure can be performed as an office procedure with or without the use of a local anesthetic, thus relieving the patient's anxiety, and it permits an early and efficient treatment planning process.<sup>[20,21]</sup> We concluded that reliance solely on clinical examination and routine diagnostic test like FNAC in assessment of OSCC may not be appropriate and other diagnostic modalities should be considered. Although histopathological examination is the gold standard, use of additional imaging modality (CT, MR imaging, and/or ultrasound scanning) can increase the accuracy of detecting LN metastasis.

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