

# Accuracy of Fine Needle Aspiration Cytology of Cervical Lymph Nodes in Cancer Patients: A Research Study in the Northern Province of India

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## ABSTRACT

**Aim:** To assess the efficacy of fine needle aspiration cytology (FNAC) in submandibular lymphadenopathy.

**Type and duration of study:** This prospective study was done in cancer patients at Dr OP Chaudhary Cancer Institute, Lucknow, India.

**Materials and methods:** A total of 120 patients were selected for the study with positive submandibular lymph node and clinically detectable lesion of the mandibular region of the oral cavity. All patients underwent thorough history-taking and clinical examination. Proper investigation was done for all patients with their consent. All patients underwent FNAC of the submandibular lymph node via direct and ultrasound-guided FNAC. This was followed by biopsy of the primary lesion. Samples were sent for investigation.

The FNAC result was compared with biopsy reports to evaluate the accuracy of FNAC.

**Results:** The study showed that out of 120 FNAC samples, 115 were positive for malignancy with an accuracy of 95.83%. Five samples (4.17%) did not show malignant cells.

**Conclusion:** Fine needle aspiration cytology can be a reliable diagnostic tool in lymphadenopathy cases to differentiate between benign and malignant lesions of the oral cavity.

**Keywords:** Biopsy, Lymphadenopathy, Malignancy, Ultrasound.

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## INTRODUCTION

Lymph node metastasis is a sequel of local metastasis of lymphatics of orofacial malignancies. Lymph nodes show malignant cells that can range from microscopic involvement to extranodal spread. Clinical evaluation in cases where involvement may be at only the microscopic level due to short duration of pathogenesis of malignancy and its appearance in the oral cavity may put clinicians into a diagnostic dilemma about lymph node metastasis. This phenomenon occurs because of enlargement and tenderness of lymph nodes in cases of other diseases of the oral cavity, like benign tumors, infections, trauma, ulceration of mucosa, and inflammatory conditions. Therefore, fine needle aspiration cytology (FNAC) of such lymph nodes may provide an important diagnostic clue for the assessment of node and nature of pathology.<sup>1</sup>

It is a simple technique that sometimes requires guidance from the technical field of ultrasound and computed tomography (CT) in cases when lymph nodes are deeply seated, when the patient is obese, or when the position of needle in such patients cannot be assessed. Submandibular lymph nodes are superficially placed anatomically; therefore, occasionally ultrasound-guided FNAC may be required in obese patients, but CT-guided FNAC may not be required in such cases.

Fine needle aspiration cytology poses certain complications like risk of hemorrhage and hematoma formation due to puncture of vessels in the vicinity of the nodes.<sup>2</sup> Another issue with the technique may be fear of needle track implantation, which may be because of use of large bore needles (i.e., 18 gauge).<sup>3</sup>

Different clinicians have performed various techniques associated with lymph nodes in the past and have advocated the use of the technique as essential in diagnosis making.<sup>4</sup>

## MATERIALS AND METHODS

The study was carried out in the surgical oncology department of the Dr OP Chaudhary Hospital and Research Centre, Lucknow, India, from March 2011 to March 2013.

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During this period, 120 patients were selected among 380 cases reported to the cancer center with malignancies of the oral cavity associated with cervical lymph node. Patients were selected irrespective of their sex, religion, and socioeconomic status. Selected cases were clinically assessed as malignancy with neck node involvement.

Inclusion criteria for the selection of cases were: based on age (i.e., 12–65 years), size (i.e., upto 2 cm; T1), presence of a primary lesion in the mandibular body region, mucobuccal fold of the body of the mandible, and positive submandibular neck nodes.

Exclusion criteria were: Patients did not fall in the desired age group, primary lesion could not be assessed, the size of the lesion was larger than 2 cm, the lesion involved other than the body, e.g., the lingual aspect of the mandible or the neck node fixed to the surrounding region.

All patients underwent routine essential investigations to perform the FNAC and biopsy. Preoperative antibiotics were given to all patients, i.e., capsule Mo×500 t.d.s., tablet Metrogyl 400 mg t.d.s., capsule Becosule 1-2 days before procedure for up to 5 days. The cytology was done without local anesthesia in all cases as a standard procedure including aspiration, slide making, fixing, and transporting to the lab in preservation media. Fifteen patients required ultrasound-guided FNAC of nodes due to their inability to assess the position of the needle, which could result in false aspiration. A cytological examination of the sample was done in the lab.

On the same visit, all patients underwent the biopsy procedure under local anesthesia as per biopsy procedure protocols. Samples were sent for histopathological examination.

Reports of cytology and histopathology were obtained and data were matched for a comparison of the presence of malignancy in both samples. This was done to evaluate the efficacy of FNAC in comparison to biopsy as histopathological reports of biopsy were considered as gold standard for evaluation.

## RESULTS

The analysis of results showed that 119 out of 120 patients showed the presence of malignant changes in histopathological reports, whereas 1 patient showed false negative result, which was confirmed via re-biopsy of the lesion. In the same patient, FNAC showed positive reports for malignancy. An analysis of cytological reports of the 120 patients showed positive results for malignancy in 115 patients, and 5 patients showed negative report for the presence of malignant cells and showed inflammatory and hyperplastic changes.

These reports showed that the accuracy of FNAC was 95.83% with 4.17% negative results. The interpretation of

results can indicate a high rate of accuracy of FNAC in metastatic nodes.

## DISCUSSION

Lymphadenopathy of the cervical region is a common finding in cases of orofacial diseases.<sup>5</sup> It alarms about the presence of any disease in the orofacial region, which may range from inflammation to malignancies. In India the most common cause for lymphadenopathy is tuberculosis.<sup>6</sup> Malignancies have metastatic potential, which is one of the hazardous sequelae of the disease. This metastasis occurs via hematogenous and lymphatic routes. Metastasis to adjacent areas is called local metastasis and to distant organs is called distant metastasis.

Local metastasis of the orofacial region occurs in the cervical region via a lymphatic route, which drains orofacial lymphatics. The different levels of lymph nodes in the neck are level I, II, III, IV, V, VI, and VII. Lymphatic spread in the cervical region occurs in a systematic way and involves these levels step by step. Rarely it spreads unsystematically when skip metastasis of nodes occur.

Malignancies from the oral region, especially from the mandible, spreads to the submandibular lymph node; therefore, we have chosen FNAC of the submandibular lymph node to focus on a precise pathway of metastasis. In our study we observed this established pathway of spread, and 4.17% of the cases that did not show malignant cells in lymphatic tissue may actually not be involved at that point of time because of the initial phase of origin of malignancy. An increase in size of the lymph node may be attributed to inflammation or infection associated with pathology. Another possibility of showing absence of malignant cells may be because of false aspiration of fluid because of inappropriate needle tip position, which may not be into the lymph node but in the surrounding tissues. An improper technique like drying of the aspirated fluid on slide due to delay in fixation may be one of the causes of negative results in FNAC; the phenomenon of skip metastasis can be one answer to such situations.

Screaton et al reported in their study that ultrasound-guided FNAC of the node has shown sensitivity of 98%, specificity of 100%, and accuracy of 98.7%.<sup>7</sup>

We have experienced some cases in our center that are not included in this study where there was involvement of cervical lymph nodes but the primary lesion was not identifiable clinically. In such cases FNAC can be a very important tool to distinguish between benign and malignant lesions.<sup>8,9</sup>

The technique is also useful in diagnosing tuberculosis and other lesions; therefore, we recommend that FNAC should also be considered as an important diagnostic

tool in case of dilemma of diagnosis, although it poses the risk of hemorrhage, false-negative aspiration, and chances of needle seeding of malignancy.<sup>10</sup> We have performed this procedure in conjunction with biopsy of the primary lesion to standardize FNAC results, but it is recommended that FNAC be widespread in all indicated cases to get better results.

## CONCLUSION

It can be concluded from this research that FNAC can be very useful in diagnosis making and saving time in cases of diagnostic dilemma; thus, it plays a vital role in treatment planning and early detection.

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