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**Research Article**

# Study of metastasis in lymph node by fine needle aspiration cytology: our institutional experience

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## ABSTRACT

**Background:** Fine needle aspiration cytology (FNAC) is a reliable as well as an inexpensive diagnostic method. It is suitable for the developing countries for the diagnosis of lymphadenopathy at any approachable site. Fine needle aspiration cytology not only confirms the presence of metastatic disease but also, in most cases, gives the clue regarding the origin of the primary tumor, prognosis as well in the management of patient for staging purposes. The aim of the study was to detect and diagnose metastasis in lymph nodes.
**Methods:** A study was done of all metastatic lymph node lesions reported in Department of Pathology, Govt. Medical College, Surat from May 2011 to April 2012**.**
**Results:** A total of 2355 cases of fine needle aspiration cytology were carried out of which 580 cases were of lymph node. Cytology results were positive for metastasis in 157 specimens (27.06%). The most common site was cervical lymph nodes. Maximum numbers of cases of metastatic tumors were in 41-50 yrs age group. There were 115 males and 42 females with a male predominance (Male:Female= 2.8:1). The most common malignancy was squamous cells carcinoma, seen in 118 cases (75.15%), followed by metastatic mammary carcinoma (13 cases, 8.29%). In 26 cases out of 580 cases, histopathological confirmation was done and diagnostic accuracy of FNAC was 100%.
**Conclusions:** Fine needle aspiration cytology of lymphadenopathy is a useful tool in diagnosing metastatic lesions with good certainty.

**Keywords:** Fine needle aspiration cytology, Lymphadenopathy, Metastasis

## INTRODUCTION

Lymphadenopathy is one of the most common clinical presentations of patients attending the outdoor department. Fine Needle Aspiration Cytology (FNAC) is a reliable, simple, safe, rapid and inexpensive method of establishing the diagnosis of lesions and masses at various sites and organs.[1] Aspiration cytology is a valuable diagnostic tool when used in proper clinical setting with appropriate clinico- pathological back up.[2] FNAC has been used extensively for the diagnosis of primary and secondary malignant disorders involving lymphnodes.[3] FNAC not only confirms the presence of metastatic disease, but also gives the clue regarding the nature and origin of primary malignancy, prognosis as well in the management of patient for staging purposes. FNAC is useful for the detection of recurrence and new metastasis.[4] Malignancies in lymph nodes in our country are predominantly metastatic in nature with an incidence varying from 65.7% to 80.4% and lymphomas range from 2% to 15.3% among lymph nodes aspirated from all sites.[5] It we get the enough material we can prepare cell block and with the help of ancillary techniques such as cytochemistry, histochemistry and immunohistochemistry differential diagnosis of metastatic lesions can be done. The aim of study was to highlight the role of FNAC's of lymph nodes in the

diagnosis of suspected and unsuspected lymph node malignancies.

## METHODS

The prospective study of Fine needle aspiration cytology in Lymphadenopathies was conducted between May 2011 to April 2012 at Department of Pathology, Government Medical College and New Civil Hospital, Surat.

Total 580 cases were studied in one year duration. Aspiration was done by using 22-24 gauge disposable needle and 10 ml syringe, and prepared slides were stained with May Grunwald Giemsa (dry fixation), Papanicolaou (wet fixation) and Hematoxylin and Eosin (wet fixation). Cytomorphological features like the overall cell population, predominant pattern were assessed by examination under low power. Then the individual cell morphology was studied under high power. Where ever necessary special stains like diastase resistant Periodic acid Schiff (PAS), cell block preparation and Immunocytochemistry was done. Final smear was reported after correlating the clinical data and other investigations.

## RESULTS

Total 2355 cases obtained in cytopathology section in this one year, out of which 580 (24.63%) cases were lymph node FNACs. Out of 580 cases of lymphadenopathies, 157 cases were diagnosed as metastatic tumors.

As shown in Table 1, Out of 157 cases of metastatic tumors, maximum no. of cases were metastatic squamous cell carcinoma (118 cases-75.15%).

**Table 1: Distribution of metastatic tumors on FNAC.**

| Metastatic tumors | No. of cases | % |
|---|---|---|
| Squamous cell carcinoma (SCC) | 118 | 75.15 |
| Adenocarcinoma (Adeno) | 3 | 1.91 |
| Papillary thyroid carcinoma (PTC) | 1 | 0.64 |
| Poorly differentiated carcinoma (Poorly diff.) | 12 | 7.64 |
| Germ cell tumors (GCT) | 3 | 1.91 |
| Malignant melanoma (Ma. mela) | 3 | 1.91 |
| Undifferentiated tumors (Undiff) | 4 | 2.55 |
| Mammary carcinoma (Mam ca) | 13 | 8.29 |
| Total | 157 | 100 |

As shown in Table 2, Maximum no. of cases of metastatic tumors were in 41-50 yrs age group. There were 115 males and 42 females with a male predominance [Male (M):Female (F)= 2.8:1].

As shown in Table 3, Metastatic tumors were common in cervical region (129 cases). Of these 129 cases, 115 cases were sub typed as Squamous cell carcinoma, 13 cases as mammary carcinoma and 12 cases as poorly differentiated carcinoma. 16 cases were aspirated from axillary region while 11 cases from inguinal region.

As shown in Table 4, In 26 cases out of 580 cases, histopathological confirmation was available.

**Table 2: Distribution of age & sex in relation to sub typing of metastatic tumors.**

| Age (Yrs) | Metastatic tumors | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SCC | | Adeno | | PTC | | Poorly diff. | | GCT | | Ma. mela | | Undiff | | Mam ca | |
| | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F |
| 0-10 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - |
| 11-20 | - | - | - | - | - | - | 1 | - | 1 | - | - | - | - | - | - | - |
| 21-30 | 1 | - | - | - | 1 | - | - | 1 | 1 | - | - | - | - | - | - | - |
| 31-40 | 17 | 6 | 1 | - | - | - | 2 | - | - | - | 1 | - | 1 | - | - | 5 |
| 41-50 | 24 | 7 | 1 | - | - | - | 4 | 1 | 1 | - | - | - | 2 | - | - | 5 |
| 51-60 | 22 | 7 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | 1 |
| 61-70 | 23 | 2 | - | 1 | - | - | - | - | - | - | 2 | - | - | - | - | 2 |
| >70 | 6 | 3 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - |
| Total | 93 | 25 | 2 | 1 | 1 | - | 9 | 3 | 3 | - | 3 | - | 4 | - | - | 13 |

**Table 3: Distribution of different sub types of metastatic tumors according to site of FNAC of lymph node.**

| Site | Metastatic tumors | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | SCC | Adeno ca | PTC | Poorly diff | GCT | Ma. mela | Undiff | Mam ca | |
| Cervical | 115 | 2 | 1 | 9 | - | - | 2 | - | 129 |
| Axillary | - | 1 | - | 2 | - | - | - | 13 | 16 |
| Inguinal | 3 | - | - | 1 | 2 | 3 | 2 | - | 11 |
| General. | - | - | - | - | 1 | - | - | - | 1 |
| Total | 118 | 3 | 1 | 12 | 3 | 3 | 4 | 13 | 157 |

**Table 4: Correlation of cytological and histological diagnosis.**

| No. of cases | Cytological diagnosis | Histological diagnosis | Accuracy rate (%) |
|---|---|---|---|
| 16 | Mets. SCC | Mets. SCC | 100 |
| 2 | Mets. poorly diff. ca | Mets. poorly diff. ca | 100 |
| 2 | Mets. poorly diff. ca | Undiff. NPC | 100 |
| 1 | Mets. Mam. Ca | Mets. Mam. Ca | 100 |
| 3 | Mets. Mali. Melanoma | Mets. Mali. Melanoma | 100 |
| 1 | Mets. PTC | Mets. PTC | 100 |
| 1 | Mets. GCT | Mets. GCT | 100 |

## DISCUSSION

FNAC is of considerable value in disease staging and documentation of metastasis in known primary and occult tumors. FNAC is a reliable diagnostic tool for lymphadenopathy in adult patients who are suspected for malignancy as it has less complication, is a simple invasive procedure and can be repeated easily. More than 90% of cases of lymph node metastasis are diagnosed by initial aspiration.[4] The diagnosis given on the cytological material is often the only diagnosis accepted and sometimes there is no further correlation with histopathology, especially in cases of advanced malignancies. It also provides clues for occult primaries with the help of ancillary techniques like cytochemistry and Immunocytochemistry and sometimes also surprises the clinician who does not suspect a malignancy.[5] Squamous cell carcinoma shows HMWCK positivity and can be differentiated from adenocarcinoma. In metastatic mammary carcinoma lobular carcinoma and invasive ductal carcinoma (IDC) can be differentiated by doing E cadherin which will be positive in IDC. In the submandibular region metastatic squamous cell carcinoma can be differentiated from high grade mucoepidermoid carcinoma with the help of diastase resistant PAS which is positive in mucinous cell of mucoepidermoid carcinoma.[6]

The most common age group affected in metastatic tumour, in present study was 41-50 yrs which correlate with other study of A.K. Kochhar et al.[1] However, Khajuria et al[7] and A.B. Pandav et al[8] found maximum cases in age group 51-60 yrs. This difference is due to early age of starting smoking and tobacco chewing in our area. Male preponderance was noted in our study, which correlates with other studies of Khajuria et al,[7] A.K. Kochhar et al[1] and A.B. Pandav et al.[8] This is because of smoking and tobacco consumptions are much more common in male population in our area.

Out of 157 cases of metastatic tumors and maximum no. of cases were metastatic squamous cell carcinoma (75.15%) followed by mammary carcinoma (8.29%). Our findings were correlate with other studies of A.K. Kochhar et al,[1] Wilkinson et al[5] and A.B. Pandav et al.[8] In present study, maximum no. of cases were found in cervical region and metastatic squamous cell carcinoma was the most frequent subtype. Similar findings were observed by Khajuria et al,[7] A.K. Kochhar et al[1] and Wilkinson et al.[5]

In present study, high accuracy rate (100%) of FNAC in diagnosis of lymphoma and metastatic tumours was found which correlate with findings of S. Shamshad et al,[9] Hirachand et al[10] and A.B. Pandav et al,[8] also found 100% accuracy rate in diagnosis of metastatic tumours.

## CONCLUSION

FNAC of lymph nodes is a very useful and simple tool in the diagnosis of lymph node malignancies. It may be the only tool in the diagnosis of metastatic lesions in the lymph nodes and can help to detect occult primary malignancies. Hence, the cytopathologist plays a vital role in the diagnosis of lymph node malignancies. Cytology evaluation along with proper clinico-radiological correlation and ancillary techniques such as cytochemistry, Immunocytochemistry and cell block preparation is quite useful in diagnosing metastasis with good degree of certainty and accuracy.

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