

Original Research Article

Fine needle aspiration: a simple and handy tool to diagnose malignant lymphadenopathy

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ABSTRACT

Background: Fine needle aspiration cytology (FNAC) of the lymph node is a simple useful screening test to diagnose suspected and unsuspected secondary and primary lymph node malignancy. The aim of the present study is to know the role of FNAC in the diagnosis of clinically suspected and unsuspected lymph node malignancies. Study design: prospective cohort study.

Methods: Study material comprise of '76' lymph nodes aspirates reported as malignant on cytology, out of total 445 cases of lymph node aspiration in two years period i.e. from October 2014 to September 2016. These 76 smears were studied and tabulated according to their cytomorphology and the lymph node group affected was noted. The clinical and radiological data were also noted.

Results: Males were found more affected than females. cervical lymph node is the commonest group involved. Metastasis from squamous cell carcinoma was the most common diagnosis made on cytology.

Conclusions: FNAC is found simple and very useful tool for diagnosing malignant lesions of lymph nodes especially in case of metastasis.

Keywords: FNAC, Lymph node, Metastasis

INTRODUCTION

Fine needle aspiration cytology is a cheap and accurate first line investigation in diagnosing lymphadenopathy. Because of early availability of results, simplicity, minimal trauma and complication, the aspiration cytology is now considered as a valuable diagnostic aid.¹

Lymph nodes are common site of metastasis for different cancers. Thus, clinical recognition and urgent diagnosis of palpable lymphadenopathy is of paramount importance specially to differentiate between inflammatory lesions or metastatic or primary neoplastic tumor.² In conjunction with radiologic studies, FNAC provides ease in following patients with known malignancy and ready identification of metastasis or recurrence.³ It can avoid the need for

excisional biopsy in most of the cases and allow rapid onset of therapy.⁴

FNAC has been predominantly used for lymphoma staging and to confirm recurrent or residual disease and now-a-days used in the primary diagnosis and sub classification of lymphomas. This is mainly due to the application of ancillary investigations, which increase the accuracy of diagnosis when compared to cytological examination alone.⁵ FNAC does not give same architectural details as histology but it can provide cells from the entire lesion as many passes through the lesion can be made while aspirating.⁶ The aim of the present study is to highlight the role of FNAC of lymph node in the diagnosis of suspected and unsuspected malignancies.

METHODS

This was a prospective cohort study conducted over two years period from October 2014 to September 2016 by cytology section of pathology department at government medical college and general hospital, Anantapuramu, Andhra Pradesh, India. All patients with complaints of Lymphadenopathy sent for FNAC were included in this study.

A detailed history, clinical examination and relevant investigations were documented. Procedure was explained and written consent was taken. FNAC of the enlarged lymph node was performed using 23G needle attached with 10 ml syringe taking aseptic precautions.

Smears were prepared from aspirated material. Smears were fixed in ethanol and stained by H and E stain. All stained smears were evaluated by cytopathologist and reported.

Data were coded and entered Microsoft excel worksheet. out of a total of ‘445’ lymph nodes aspirated during that period inadequate smears were excluded from the study. Only patients with metastatic lymphadenopathy were included in this study comprising of 76 malignant lymph node aspirates (17.08%). These 76 smears were studied and tabulated according to their cytomorphology and the lymph node group affected was noted. The results were analyzed and expressed in percentages and proportions.

RESULTS

Out of the 76 malignant cytological smears studied, 68 (89.47%) were metastatic lesions and 8 (10.53%) were lymphomas. The age group varied from 15 to 82 years,

with males (59 cases, 77.63%) being more involved than females (17 cases, 22.37%).

The lymph node involved by malignancy were 1.5cm or more in size. Malignancy was clinically unsuspected in 7 cases. Cervical group of lymph nodes were most commonly involved (47 cases; 47/76) followed by supraclavicular (15 cases; 15/76), axillary (11 cases; 11/76), Inguinal (2 cases; 3/76) lymph nodes and abdominal (1 case) as shown in Table 1.

Table 1: Distribution of number of cases according to the groups of lymph nodes involved.

| Site of lymphadenopathy | No. of cases | % |
|-------------------------|--------------|-------|
| Cervical | 47 | 61.84 |
| Supraclavicular | 15 | 19.74 |
| Axillary | 11 | 14.47 |
| Inguinal | 2 | 2.63 |
| Abdominal | 1 | 1.32 |

Table 2 shows the cytological diagnosis made on the lymph node aspirates. Among the metastatic tumors, squamous cell carcinoma (41 cases:53.95%) was the most common tumor followed by carcinoma breast (12 cases: 15.79%) and adenocarcinoma (8 cases: 10.53%).

The metastasis had occurred from primary carcinoma in lung, stomach, colon and rectum. The 12 Breast carcinoma metastasis cases (15.79%) had already known primary, hence they were kept under breast carcinoma. Two cases of malignant melanoma were noted in the inguinal lymph node with bizarre nucleus, prominent nucleolus and intracellular melanin pigment. Three cases showed papillary thyroid carcinoma metastasis to cervical lymph node.

Table 2: Involved lymph node group.

| Type of malignancy | Cervical | Axillary | Supraclavicular | Inguinal | Total no. of cases | Percentage |
|-----------------------------|----------|----------|-----------------|----------|--------------------|------------|
| Metastatic | | | | | | |
| Squamous cell carcinoma | 32 | 0 | 9 | 0 | 41 | 53.95 |
| Adenocarcinoma | 6 | 0 | 2 | 0 | 8 | 10.53 |
| Duct cell carcinoma breast | 0 | 9 | 3 | 0 | 12 | 15.79 |
| Papillary thyroid carcinoma | 3 | 0 | 0 | 0 | 3 | 3.95 |
| Malignant melanoma | 0 | 0 | 0 | 2 | 2 | 2.63 |
| Small cell carcinoma | 1 | 0 | 1 | 0 | 2 | 2.63 |
| Primary | | | | | | |
| Hodgkin’s lymphoma | 4 | 2 | 0 | 0 | 6 | 7.89 |
| Non-Hodgkin’s lymphoma | 1 | 0 | 0 | 1 | 2 | 2.63 |
| Total | 47 | 11 | 15 | 3 | 76 | 100 |

Out of 8 cases (10.53%) of lymphomas, Hodgkin’s lymphomas (6 cases) was more common than Non-

Hodgkin’s lymphoma (2 cases). The ratio of Non-Hodgkin’s to Hodgkin’s lymphomas was 1:3.

DISCUSSION

Lymphadenopathy is a commonly encountered clinical condition requiring prompt and accurate diagnosis so that a proper treatment protocol can be started as early as possible.⁷ Enlarged cervical lymph nodes are always accessible for FNAC and therefore, this procedure is of immense importance in the diagnosis of lymph node disorders.⁸ It plays a significant role in developing countries like India, as it is a relatively cheap procedure, simple to perform and practically has almost no complications.⁸

FNAC as a first line screening method has been recommended in suspected malignancy.⁹ It also provides clues for occult primaries and sometimes also surprises the clinician who does not suspect a malignancy.¹⁰ FNAC is a popular technique used in the evaluation of lymph nodes for the diagnosis of lymphomas. In conjunction with Immunophenotyping and molecular studies, it has gained acceptance in many centers as an initial diagnostic tool.¹¹

In the present study overall frequency of malignancy was found to be higher in males (M:F=3.47:1) This may be because of increased incidence of addictions in males when compared to females. Similar observations were noted by Alam et al.² In this study, out of 76 malignant lymph node aspirates, Metastasis to lymph nodes was seen in 68 cases (89.41%) and primary malignancies i.e. lymphomas in 8 cases (10.53%). These findings are in comparison with the studies conducted by Sheikh S et al and Wilkinson et al which showed 84.72%; 90% of metastatic lesions and 14.28% ,10% of primary lymphomas respectively.^{10,12}

The maximum number of aspirations were done from cervical lymph nodes (61.84%). This may be due to the easy accessibility of cervical nodes for examination and evaluation. The same findings were made in Alam K et al, Sheik S et al and Rathod G et al.^{2,12,13}

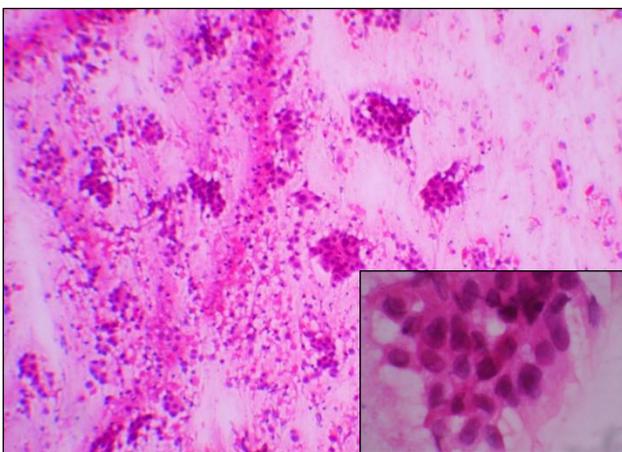
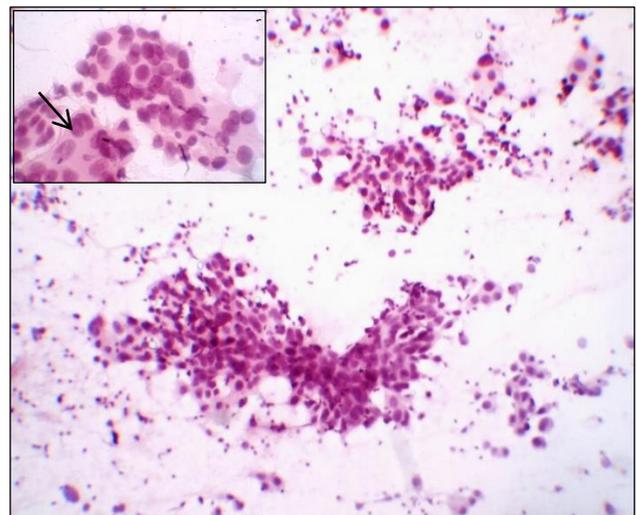


Figure 1: Squamous cell carcinoma metastatic deposits in lymph node (10X and 40X).

Metastatic squamous cell carcinoma (as shown in Figure 1) was the most common entity in present study which was comparable with other studies.^{2,3,10,12,13} Tumor cells were seen mostly in sheets and singly scattered. In well differentiated squamous cell carcinoma, the individual tumor cells show intracellular keratinisation with necrotic material in the background. So, in case of scanty cellular smear, with background showing plenty of necrosis, careful search must be done to identify the tumor cells.

In current study, metastatic ductal cell carcinoma breast was seen in 12 cases (15.79%) which was the second most common lesion as compared to other studies.^{2,10,12} All these cases had palpable breast lumps diagnosed as duct cell carcinoma breast-invasive on biopsy.

In the present study adenocarcinoma was seen in 8 cases (10.53%). The smears showed cells with acinar and occasionally papillary arrangements and singly scattered. The individual cells are large, cuboidal to columnar with moderate amount of cytoplasm and pleomorphic nuclei with prominent nucleoli. In this study three cases (3.95%) showed papillary thyroid carcinoma metastasis (as shown in Figure 2) which is slightly higher as compared to study done by Rathod G et al, who reported 1.25% of cases.¹³ The reason for this may be higher incidence of thyroid lesions in our locality which were left untreated and under diagnosed for many years.



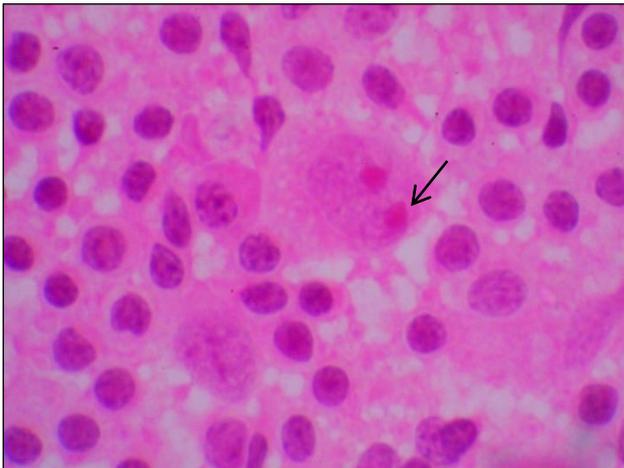
Arrow indicating intranuclear grooves.

Figure 2: Papillary carcinoma metastatic deposits in lymph node (10X and 40X).

Two cases of Metastatic small cell carcinoma were seen in cervical and supraclavicular lymph nodes for which the primary was localised in lung with other relevant investigations. Hence, FNAC can give a clue to the physician to search for primary.

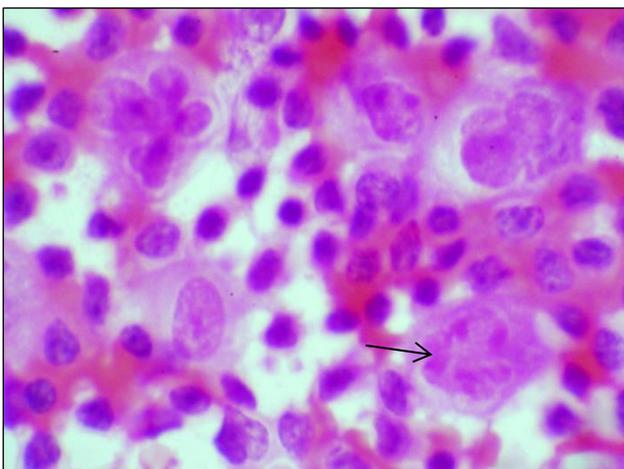
Two cases showed malignant melanoma metastasis in the inguinal lymph nodes, identified by the presence of

melanin pigment, prominent nucleoli which was like the study conducted by Rathod G et al.¹³



Arrow indicating RS cell with mirror image nuclei and prominent nucleoli.

Figure 3: Classical RS cell in Hodgkin's lymphoma (100X).



Arrow indicating popcorn cell.

Figure 4: Popcorn cells in Hodgkin's lymphoma (100X).

Among the 8 lymphoma cases studied 6 cases (7.89%) were of Hodgkin's type characterised by the presence of classical RS cells and popcorn cells (shown in Figure 3 and 4) and 2 cases (2.03%) were of Non-Hodgkin's type.

In the study conducted by Ahmed SS et al, the ratio of Non-Hodgkin's to Hodgkin's lymphoma was 2:1, present study revealed ratio of 1:3, concluding that Hodgkin's Lymphoma was more common than Non-Hodgkin's lymphoma.³ This difference may be attributed to the cases of Hodgkin's disease in present study had exposure to risk factors; two patients with Hodgkin's lymphoma had history of HIV and one patient had family history of Hodgkin's lymphoma.

CONCLUSION

FNAC of lymph nodes is a very simple and handy tool with almost no complication in the diagnosis of lymph node malignancies, especially in developing country like India with limited resources.

The diagnosis of Metastatic tumor to the lymph node on cytological smear is crucial and highly reliable. This would be the sole indication for searching the primary tumor, especially in cases of occult carcinoma and it can be used to follow up the patients where the primary tumor is known.

FNAC helps in defining the tumor type while clinical history and investigations help in identifying the tumor site. FNAC is a good screening tool for diagnosing lymphomas.

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

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