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FNAC as a Diagnostic Tool in the Evaluation of Lymphadenopathy-A Tertiary Hospital Experience

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Materials and Methods: The present study comprises of 396 patients who presented with lymphadenopathy in the department of pathology, Giansagar medical college and hospital, Ramnagar, Patiala, Punjab from April 2008 to March 2011 (3 years). All the patients were subjected to FNAC using a 10 ml syringe and 22 gauge needles. 70 cases were subjected to lymph node biopsy. The cytological results were compared with the histological findings wherever possible.

Keywords: *lymphoma, lymph nodes.*

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FNAC as a Diagnostic Tool in the Evaluation of Lymphadenopathy-A Tertiary Hospital Experience

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Observations & Results: Cervical lymph nodes were the commonest ones that were sampled (216) followed by axillary (115) and inguinal lymph nodes (65). FNAC diagnosis was divided into malignant and non malignant lesions. Metastatic cancer was the commonest malignancy observed whereas reactive hyperplasia was the commonest non malignant condition followed by granulomatous pathology. The cytological diagnosis correlated well with the histopathological diagnosis with the best correlation found in metastatic cancer (100%)

Conclusion: FNAC of lymph nodes proved to be a very useful tool in the diagnosis and early evaluation of enlarged lymph nodes. It is useful in diagnosis of both neoplastic as well as non neoplastic conditions.

Keywords: lymphoma, lymph nodes.

I. INTRODUCTION

Fine needle aspiration cytology (FNAC) is a simple and rapid diagnostic technique. It is an accepted procedure to diagnose lesions in the thoracic and abdominal cavities as well as superficial lumps in the body⁽¹⁾. Since this technique lends itself to outpatient diagnosis, it is eminently suited for use in peripheral medical centers⁽²⁾.

Lymphadenopathy is one of the commonest clinical presentations in the outdoor patients. Etiology

can vary from an inflammatory process to a malignant condition^(1,3). FNAC is a safe accurate, repeatable, sensitive, specific and a cost-effective procedure in the diagnosis of lymphadenopathy^(1,3,4). In the past, the assessment of lymphadenopathy was made indirectly from the clinicopathological parameters or biopsy, but with the resurgence of FNAC as a diagnostic tool, procedure of biopsy is mostly avoided^(3,5). The cytomorphological features obtained in needle aspiration frequently correlate very well with histological appearance and in some cases has qualities of a micro biopsy⁽¹⁾.

FNAC can be more useful than open biopsy in cases where there is multiple lymphadenopathy. On open biopsy, the surgeon can excise only those lymph nodes accessible through the incision. Severe inflammation around the lymph nodes can hinder the identification of tissues and excised specimen may not be representative. With FNAC, nearly all the palpable nodes can be aspirated, thus providing better sampling and a higher diagnostic yield^(3,5,6).

The advent of Human immunodeficiency virus (HIV) infection makes FNA particularly attractive for surgeons as it involves lesser risk to the performer than open biopsies. Acquired immunodeficiency syndrome (AIDS) related lymphadenopathy has definite patterns like florid reactive hyperplasia, folliculolysis, explosive follicular hyperplasia, lymphocytic depletion. Though FNAC cannot clearly demarcate all these lesions, it has definite identifiable reactive patterns described and is useful in detecting specific infective etiologies^(7,8).

FNAC remains the first line investigation in cases of lymphadenopathy. Besides initial diagnosis of lymphoma, it helps in diagnosis of residual disease, recurrence, progression of low grade to high grade lymphoma and also the detection of metastasis as lymph nodes are a common site of metastasis of different cancers⁽³⁾.

FNAC is also a very useful tool for the diagnosis of various infectious diseases particularly tuberculosis as acid fast staining can be easily done on the aspirates. This is very important in view of high prevalence of tuberculosis in our country, atypical presentation of tuberculosis and due to the fact that AFB are mostly seen in purulent aspirate smears which don't show any granulomas and can be dismissed as acute

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suppurative lymphadenitis in the absence of Ziehl-Neelsen staining^(2,4,10).

FNAC sometimes does pose problems in diagnosing lymphomas^(2,11). Diagnosis and particularly their subclassification is still controversial and cytological diagnosis of lymphoma is usually followed by biopsy^(3,12). The diagnosis of lymphoma on FNAC can further be improved if combined with various specialized techniques i.e. ultrasound (USG) and computed tomography (CT) guidance, cytochemistry, immunophenotyping, molecular diagnosis and flow cytometry^(3,13).

II. MATERIALS AND METHODS

The present study comprises of 396 patients who presented with lymphadenopathy in the department of pathology, Giansagar medical college and hospital, Ramnagar, Patiala, Punjab from April 2008 to March 2011 (3 years).

All the patients were subjected to FNAC using a 10 ml syringe and 22 gauge needles. Some of the slides

were air dried and the rest were put in 95% ethanol and stained with May Grunwald Giemsa (MGG) stain and Papanicolaou (PAP) stain respectively. Additional stains i.e. Ziehl-Neelsen (ZN) stain, Periodic acid Schiff (PAS) were performed wherever necessary.

The detailed history of the patient i.e. age, sex and duration of involvement and other investigations performed, were recorded. The patients were followed up. 70 cases were subjected to lymph node biopsy. The cytological results were compared with the histological findings wherever possible.

III. OBSERVATIONS AND RESULTS

- A total of 396 patients were included in the study.
- The age of the patients ranged from 4 to 88 years. Male to female ratio was 1.3:1.
- Cervical lymph nodes were the commonest ones that were sampled (216) followed by axillary (115) and inguinal lymph nodes (65).

FNAC diagnosis was divided into malignant and non malignant lesions. (Fig 1, 2)

Figures

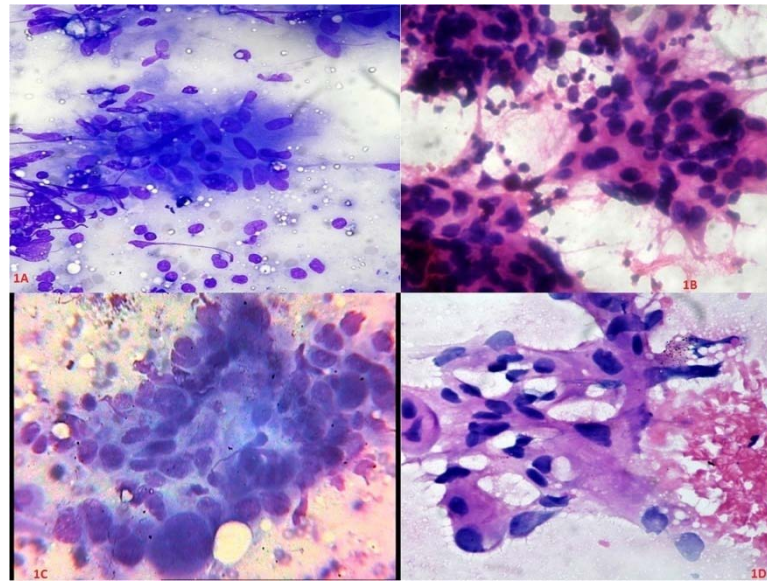


Figure 1

Fig 1 A : Granulomatous lesion – A cluster of epithelioid cells and few lymphocytes (MGG x 400)

Fig 1 B : Metastatic Adenocarcinoma – Neoplastic cells with delicate cytoplasm and pleomorphic, hyperchromatic nucleus arranged in cell clusters and glandular pattern (Papx 400)

Fig 1 C : Metastatic Squamous cell carcinoma – A cluster of neoplastic squamous cells with highly pleomorphic cells having ample basophilic cytoplasm (MGG x 400)

Fig 1 D : Metastatic Squamous cell carcinoma – A cluster of neoplastic squamous cells with highly pleomorphic cells having ample eosinophilic cytoplasm (Pap x 400)

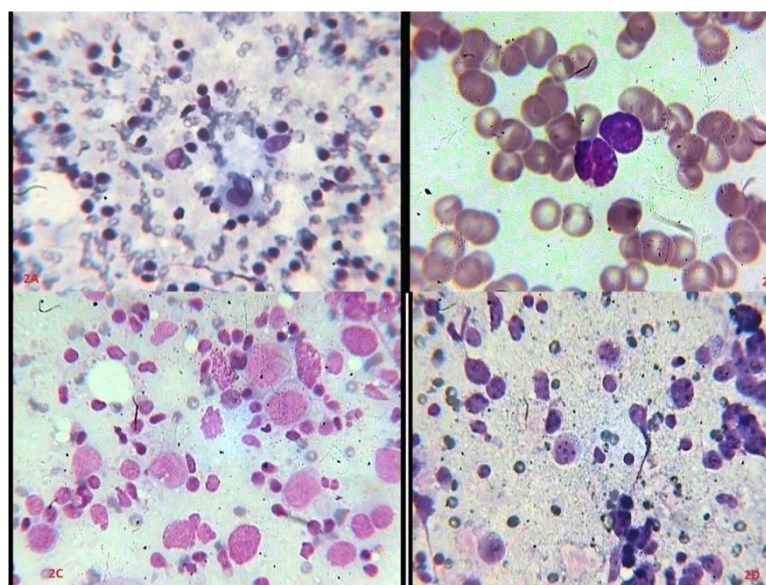


Figure 2

Fig 2 A : Hodgkin's Lymphoma: A Reed Sternberg cells (RS cell) present in a background of mixed Inflammatory cells (MGGx400)

Fig 2 B : Follicular Lymphoma (Blood film): An atypical lymphoid cell with abnormal chromatin and cleaved nucleus (Leishmann stainx1000). The blood film was examined due to the presence of increased lymphoid cells in the FNAC with atypical features.

Fig 2 C : Diffuse large B cell lymphoma: Large cells with increased N:C ratio, multiple nucleoli present against a dirty background. (MGGx400). On IHC, these cells were CD19,20,22 positive.

Fig 2 D : Anaplastic large cell lymphoma: Large cells with abundant cytoplasm, pleomorphic, irregular nuclei and multiple nucleoli. (MGGx400). On IHC, these cells were CD 30 positive.

Table I : shows the distribution of malignant lesions

Hodgkins lymphoma (HL)	11	
Non Hodgkins lymphoma (NHL)	25	
NHL with Leukemic infiltration	02	
Metastatic	51	
Total	89	

Table II : shows the distribution of non-malignant lesions

Reactive lymphadenopathy	185	
Acute suppurative lesion	41	
Granulomatous with necrosis	51	
Granulomatous without necrosis	24	
Total	301	

6 cases were excluded from the study as the material was insufficient for diagnosis.

Biopsy of the lymph node was done in 70 cases. FNAC diagnosis of these was as follows.

HL: 11

NHL: 27

Metastatic: 20

Granulomatous lesion: 12

Histopathological diagnoses of the above cases were as follows.

1) All the cases of HL on FNAC were confirmed by biopsy. 7 were mixed cellularity and 4 were nodular sclerosis. These cases were confirmed by immunophenotyping. They were positive for CD 15 and CD 30. However 1 case of HL was diagnosed as granulomatous lesion on FNAC due to intense granulomatous response. Also 2 cases of HL were diagnosed as NHL on FNAC but turned out to be HL on histopathology. Therefore, FNAC showed a sensitivity of 78.6% in diagnosing HL whereas the

specificity was 100% considering histopathology as the gold standard.

- 2) 25 out of 27 cases diagnosed as NHL on FNAC were confirmed by biopsy. 2 cases turned out to be lymphocyte predominant HL which were confirmed by immunophenotyping. Thus the sensitivity of FNAC in diagnosing NHL was 100% where as specificity was 95.7%. 25 cases of NHL were further sub typed as follows on immunophenotyping.
 - Follicular lymphoma
 - Small lymphocytic lymphoma
 - Diffuse large B cell lymphoma
 - Burkitt's lymphoma
 - Anaplastic large cell lymphoma
- 3) All the metastatic lesions diagnosed by FNAC were confirmed on histopathology. Their distribution was as follows:
 - Squamous cell carcinoma:11
 - Adenocarcinoma:07
 - Small cell carcinoma: 1
 - Undifferentiated carcinoma: 1

Therefore, FNAC showed a high sensitivity and specificity of 100% in diagnosing metastatic lesions.

- 4) Out of 12 granulomatous lesions diagnosed on FNAC, 11 showed positive correlation on histopathology, 1 was diagnosed to be a case of HL with granulomatous reaction. This case was missed on FNAC due to intense granulomatous reaction which obscured the presence of Reed Sternberg (RS) cells. Thus the sensitivity of FNAC was 100% in these cases. Specificity was found to be 97.67%.
- 5) All 58 malignant cases diagnosed on FNAC, which were subjected to biopsy were confirmed on histopathology. Thus the sensitivity and specificity of FNAC in diagnosing metastasis was found to be 100% each.

IV. DISCUSSION

FNAC is a simple, safe, cost effective, quick as well as an efficient diagnostic procedure with relatively no contraindications and no side effects. It forms an important tool for diagnosing various causes of lymphadenopathy^(1,2,4).

In our study, there was a slight male preponderance with male:female ratio of 1.3:1. This is in accordance with various other studies with similar findings^(1,4,5).

Lymph node enlargement can occur in a diverse age group from very early age to elderly. The youngest patient in our study was 4 years of age where as the oldest was 88 years. These figures compare to the findings in other studies^(1,4,5,7,9).

The commonest lymph nodes sampled were cervical, followed by axillary and inguinal. These findings are also consistent with those observed in other studies^(1,2,3,5,7).

The causes of lymphadenopathy are diverse and range from innocuous reactive hyperplasia, suppurative pathologies and granulomatous lesions to dreaded malignancies i.e. lymphomas and metastatic carcinomas. Out of a total of 396 patients in our study, 89 were diagnosed as malignant and 301 as non malignant on FNAC. 6 patients were excluded from the study as the material was insufficient and the patient was lost for follow up. These values are also in accordance with results of other studies^(1,3,4,7,8,13). The predominance of infective conditions in the etiology correlates well with the fact that in our country, the infectious diseases outnumber the malignant ones and also because the malignancies tend to be examined at a later age in contrast to the western countries where malignancies are reported earlier.

Majority of the cases were reactive in nature (47.5%). These results correlate well with other studies^(1,3,9).

Granulomatous pathology accounted for 75 cases (19.2%). 51 were with necrosis and 24 without necrosis. The incidence of AFB positivity was more in cases with necrosis (35/51) in contrast to those without necrosis (04/24). This is due to the reason that abundant necrosis is seen in individuals with immune-compromised status which leads to greater AFB positivity whereas in patients with a good immune status, there is formation of more granulomas, less necrosis and less AFB positivity.

Among the malignancies, metastatic carcinomas constitute the predominant group constituting a total of 51 cases (13.07%). All the cases which were subjected to histopathology (20) showed positive correlation. The majority of the metastatic carcinomas were Squamous cell carcinoma which was in accordance with various other studies^(1,3,12,13,14,15).

Lymphomas on FNAC constituted 38 of the total cases (9.74%) which correlated well with other studies^(1,2,11). 11 were diagnosed as HL and 27 as NHL on FNA. 02/27 diagnosed as NHL also showed leukemic infiltration in the peripheral blood and were diagnosed as follicular lymphoma on histopathology. All the cases of HL on FNAC were confirmed by biopsy. 7 were mixed cellularity and 4 were nodular sclerosis. These cases were confirmed by immunophenotyping. They were positive for CD 15 and CD 30. However 1 case of HL was diagnosed as granulomatous lesion on FNAC due to intense granulomatous response. Also 2 cases of HL were diagnosed as NHL on FNAC but turned out to be HL on histopathology. Therefore, FNAC showed a sensitivity of 78.6% in diagnosing HL whereas the specificity was 100% considering histopathology as the gold standard.

25 out of 27 cases diagnosed as NHL on FNAC were confirmed by biopsy. 2 cases turned out to be lymphocyte predominant HL which were confirmed by immunophenotyping. Thus the sensitivity of FNAC in

diagnosing NHL was 100% where as specificity was 95.7%.

V. CONCLUSION

FNAC of lymph nodes proved to be a very useful tool in the diagnosis and early evaluation of enlarged lymph nodes. It is useful in the diagnosis of both neoplastic and non neoplastic conditions with good sensitivity and specificity. In many cases, it reduces the need for a surgical procedure to be performed on the patient.

- FNAC showed a sensitivity of 78.6% in diagnosing HL whereas the specificity was 100% considering histopathology as the gold standard.
- The sensitivity of FNAC in diagnosing NHL was 100% where as specificity was 95.7%.
- FNAC showed a high sensitivity and specificity of 100% in diagnosing metastatic lesions.
- The sensitivity of FNAC in diagnosing granulomatous lesions was 100%. Specificity was found to be 97.67%.
- The sensitivity and specificity of FNAC in diagnosing metastasis was found to be 100% each.

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