

Assessment of disease pattern of lymphadenopathy among patients presenting to Rural tertiary care teaching hospital of western Maharashtra

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Abstract

Background: Lymph nodes are widely distributed and easily accessible lymphoid tissue, which are frequently examined for diagnostic purposes. In the past lymph nodes were the first organs to be sampled by FNA. FNAC is useful before an open biopsy where the patients present with multiple lymph node enlargements. The study intends to find out systematically the various pathological conditions presenting with enlarged lymph nodes and cytomorphological appearance of these conditions in tertiary rural hospital in western Maharashtra. **Materials & methods:** A total of 247 patients were included in present study. These patients were clinically evaluated and informed consent was obtained for the procedure. Lymph node to be aspirated was first examined thoroughly to determine the site of aspiration. Under aseptic precautions the node was held between the left index finger and thumb, followed by insertion of a 22 or 23 gauge needle fitted to a 10 ml syringe for routine lymph node aspiration. Two smears were immediately fixed in 95% ethyl alcohol and two were air dried. Alcohol fixed and air dried smears were stained with Papanicolaou stain and May-Grunwald-Giemsa stain respectively. Ziehl-Neelsen stain was done for all the cases where necrotic material was aspirated or clinically suspected tuberculosis and HIV. Data regarding relevant radiological, biochemical and haematological investigations done for diagnostic purposes were collected. Histopathological study was done separately and then results of cytological and histopathological study were correlated to evaluate efficacy of the procedure. **Results:** Age of the patient varied between 1.5 years to 85 years. Out of 223 satisfactory smears, 118 (47.8%) constituted benign lesions, 92 cases (37.2%) were of metastasis and 13 (5.3%) cases were of lymphoma. Out of total non-neoplastic lesion, reactive hyperplasia was seen in 52.5% of cases whereas tubercular lymphadenitis constitutes 22.9% cases. Metastatic squamous cell carcinoma commonly involved the submandibular and cervical groups. While, the axillary and supraclavicular nodes showed involvement by metastatic deposits of infiltrating ductal carcinoma in maximum cases. Children and adolescents were commonly involved by chronic nonspecific reactive hyperplasia while metastatic squamous cell carcinoma was seen affecting elderly and older individuals. **Conclusion:** FNAC is a simple, rapid & accurate diagnostic technique in evaluation of lymphadenopathies. It helps the clinicians to take early decision for management and avoid unnecessary surgery.

Keywords: Lymphadenopathy, Rural, Maharashtra

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Introduction

Lymph nodes are widely distributed and easily accessible lymphoid tissue, which are frequently examined for diagnostic purposes. They are discrete encapsulated structure, which contains well organized B-cell and T-cell zone. Lymphadenopathy refers to nodes that are abnormal in size, consistency or number. The knowledge of the pattern of etiological factor that causes lymphadenopathy in a specific region must be known for suspecting a disease or making a definitive diagnosis. Fine needle aspiration cytology (FNAC) is usually performed without local anesthesia and the patient does not require any previous preparation [1-3]. In the past lymph nodes were the first organs to be sampled by FNA. Today they are the most frequently sampled tissue. As a result of pioneering work of Franzen et al (1960) and the widespread current acceptance of the technique, aspiration of lymph nodes has become a standard laboratory

procedure. The use of FNAC in the investigation of lymphadenopathy has become an acceptable and widely practiced minimally invasive technique, which is safe, simple, rapid and relatively pain-free [4,5]. FNAC is useful before an open biopsy where the patients present with multiple lymph node enlargements. The technique has been found most useful for the selection of a representative node for biopsy, for the diagnosis of lymphoma, for staging the extent of the disease, and for monitoring treatment. This has inevitably led to acceptance of FNAC as a method which is comparable to histopathology in diagnostic accuracy [5-7]. The study intends to find out systematically the various pathological conditions presenting with enlarged lymph nodes and cytomorphological appearance of these conditions in tertiary rural hospital in western Maharashtra.

Materials & methods

All the patients with enlarged lymph nodes clinically, referred to the Department of Pathology for FNAC were included in the study. All the patients referred to the department of Pathology, for FNAC of palpable lymph node lesions were enrolled for the study. FNAC was done and the standard method for the procedure was adopted. All the slides were reviewed and diagnosis was given. A total of 247 patients were included in present study. These patients were clinically evaluated and informed consent was obtained for the procedure.

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Lymph node to be aspirated was first examined thoroughly to determine the site of aspiration. Under aseptic precautions the node was held between the left index finger and thumb, followed by insertion of a 22 or 23 gauge needle fitted to a 10 ml syringe for routine lymph node aspiration. The needle with syringe was introduced into the node; the plunger of the syringe was pulled to create a negative pressure. With the negative pressure intact, the needle was moved to and fro within the node at least two to three times, to aspirate adequate material. The negative pressure was released and the needle along with the syringe was withdrawn from the node. Pressure was applied to the area with a cotton swab after the needle was withdrawn. The needle was detached from the syringe, air was drawn into the syringe, needle was reattached and the material was dispensed on to glass slides. Two smears were immediately fixed in 95% ethyl alcohol and two were air dried. Alcohol fixed and air dried smears were stained with Papanicolaou stain and May-Grunwald-Giemsa stain respectively. Ziehl-Neelsen stain was done for all the cases where necrotic material was aspirated or clinically suspected tuberculosis and HIV. Smears were examined and cytological diagnosis offered. Data regarding relevant radiological, biochemical and haematological investigations done for diagnostic purposes were collected. Histopathological study was done separately and then results of cytological and histopathological study were correlated to evaluate efficacy of the procedure.

Results

Age of the patient varied between 1.5 years to 85 years. Majority of the patients were in the age group of 31-60 years. Out of 247 patients 132 (53%) were male and 115 (47%) were females. There was male

preponderance. Out of 247 cases, 24 (9.7%) cases were inadequate for opinion even after repeated aspiration. Out of 223 satisfactory smears, 118(47.8 %) constituted benign lesions, 92cases (37.2%) were of metastasis and 13(5.3%) cases were of lymphoma. Out of total non-neoplastic lesion, reactive hyperplasia was seen in 52.5% of cases whereas tubercular lymphadenitis constitutes 22.9% cases. Granulomatous lymphadenitis and abscess were seen in 12.7% and 11.9% of cases respectively. Cytologically, metastasis was present in 37.2% cases. of these squamous cell carcinoma was present in 55.4% cases, 22.8% cases were of infiltrating ductal carcinoma whereas 10.9% cases were of poorly differentiated carcinoma. Other metastatic lesions included 5.4% cases of adenocarcinoma, 4.3% cases of malignant melanoma and 1.1% case of nasopharyngeal carcinoma. Cervical lymph nodes were most commonly involved in all age groups. Maximum cases were in pediatric and adolescent age group. Axillary lymph nodes were commonly involved in 50-70 years age group. While inguinal, submandibular and supraclavicular were seen commonly involved in 40-50 years of age group. Patients with cervical group of lymph nodes were commonly affected by chronic nonspecific reactive hyperplasia. Metastatic squamous cell carcinoma commonly involved the submandibular and cervical groups. While, the axillary and supraclavicular nodes showed involvement by metastatic deposits of infiltrating ductal carcinoma in maximum cases. Children and adolescents were commonly involved by chronic nonspecific reactive hyperplasia while metastatic squamous cell carcinoma was seen affecting elderly and older individuals.

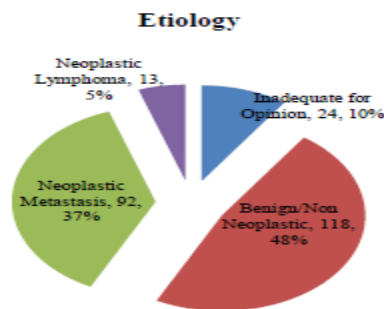


Fig 1: Distribution of patients according to etiology

Table1: Age wise distribution of cases

Age	No.of cases	Percentage
0-10	34	13.8
11-20	30	12.1
21-30	23	9.3
31-40	36	14.6
41-50	39	15.8
51-60	33	13.4
61-70	36	14.6
71-80	14	5.7
81-90	2	0.8
Total	247	100

Age of the patient varied between 1.5 years to 85years. Majority of the patients were in the age group of 31-60 years. Table I gives age distribution in the study group.

Table 2:Sex wise distribution of cases

Sex	No.of cases	Percentage
Male	132	53
Female	115	47
Total	247	100

Out of 247 patients 132 (53%) were male and 115 (47%) were females. There was male preponderance.

Table 3: Site of involvement

Site of Node	No. of Cases	Percentage
Cervical	121	49.0
Sub Mandibular	37	15.0
Inguinal	36	14.6
Supraclavicular	26	10.5
Axillary	25	10.1
Aortic	2	0.8
Total	247	100.0

Cervical lymphnodes (n=121, 49%) were the most commonly involved group followed by submandibular (n=37, 15%), inguinal (n=36, 14.6%), supraclavicular (n=26, 10.5%), axillary (n=25, 10.1%) and aortic (n=2, 0.8%).

Table 4: Distribution of non-neoplastic/benign lesions

FNAC Diagnosis	No. of Cases	Percentage
Reactive Hyperplasia	62	52.5
Tubercular Lymphadenitis	27	22.9
Granulomatous Lymphadenitis	15	12.7
Acute/Abscess	14	11.9
Total	118	100.0

Table 5: Distribution of patients according to metastatic lesions

Metastatic Lesions	No. of Cases	Percentage
Squamous cell carcinoma	51	55.4
Infiltrating ductal carcinoma	21	22.8
Poorly differentiated carcinoma	10	10.9
Adenocarcinoma	5	5.4
Malignant melanoma	4	4.3
Nasopharyngeal carcinoma	1	1.1
Total	92	100.0

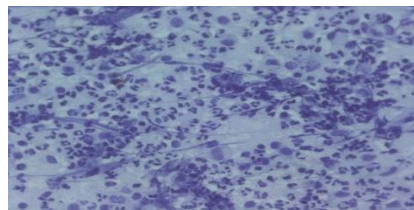


Fig 1:Suppurative lymphadenitis:Smear shows acute inflammatory cells, variable number of lymphocyte and cellular debris on a necrotic background [PAPx400].

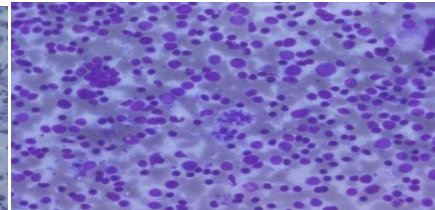


Fig 2:Reactive Hyperplasia:Smear shows polymorphous population of lymphocytes and tingible body macrophages (MGG stain x 400)

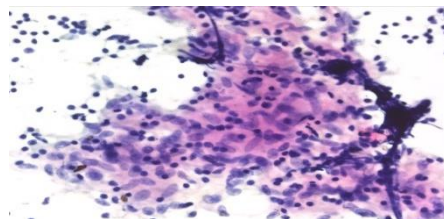


Fig 3:Granulomatous lymphadenitis: Smear shows non necrotizing epithelioid cell granuloma in a background of lymphocytes. [PAPx400].

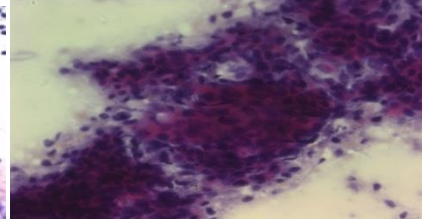


Fig 4:Metastatic squamous cell carcinoma: Smear shows clusters of keratinizing malignant squamous cells. [PAPx400].

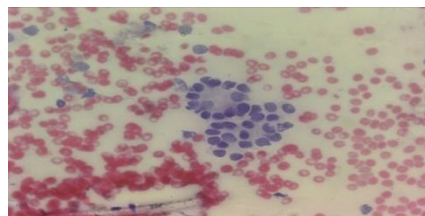


Fig 5:Metastatic adenocarcinoma: Smear shows malignant cells arranged in a glandular pattern. [PAPx400].

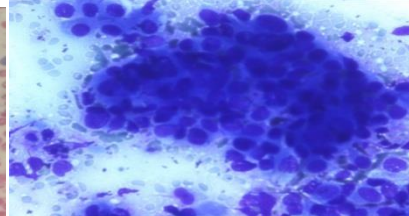


Fig 6:Metastatic infiltrating ductal carcinoma: Smears shows atypical cells arranged in dyscohesive clusters with scant to moderate cytoplasm pleomorphic nuclei with prominent nucleoli. [PAPx400].

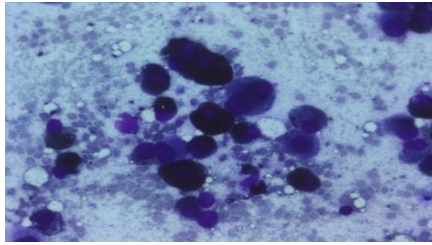


Fig 7: Metastatic malignant melanoma: Smear shows pleomorphic population of tumor cells with cytoplasmic melanin pigment. [PAPx400].

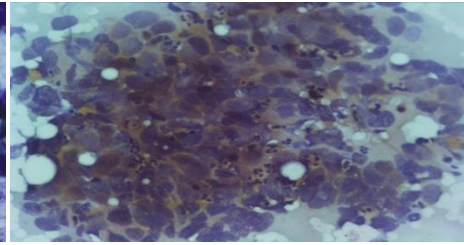


Fig 8: Metastatic nasopharyngeal carcinoma: Smear shows tumor cells with vesicular nuclei, prominent nucleoli in a lymphocytic background and prominent mitosis. [PAPx400].

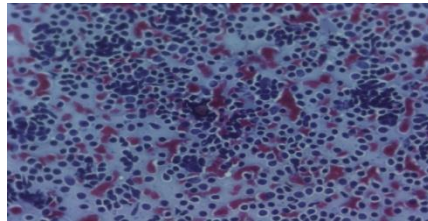


Fig 9: Non Hodgkin lymphoma (SLL): Smear shows monotonous population of slightly enlarged atypical lymphoid cells with coarsely granular chromatin. [PAPx400].

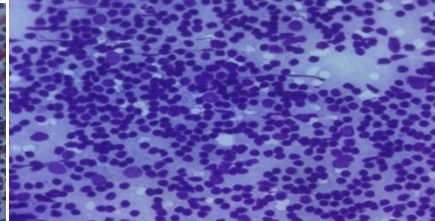


Fig 10: Non Hodgkin lymphoma (DLBCL): Smear showing predominance of large centroblastic lymphoid cells with pale nuclei, scant cytoplasm and multiple, often peripheral, nucleoli. [PAPx400].

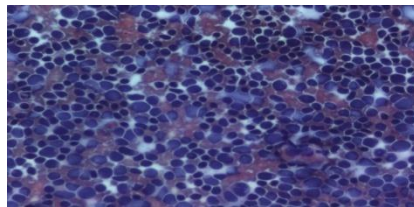


Fig 11: Leukemic infiltrate (ALL): Smear shows small to medium sized lymphoid cells with cleaved nuclei and smudge cells. [PAPx400].

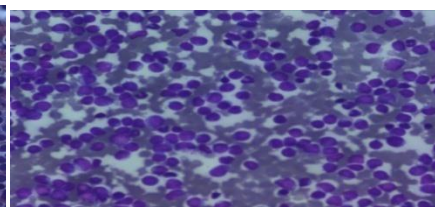


Fig 12: Leukemic infiltrate (AML): Smear shows myeloblasts with large nucleus and multiple nucleoli. [MGG x400].

Discussion

Squamous cell carcinoma was the most common metastatic tumor in our study. Similar results were seen in studies of More et al, Wilkinson et al, Hirsch et al, Satish et al and Pandav et al, as shown in table. Cervical lymph nodes were the most commonly involved lymph nodes. Males were more commonly involved. The primary sites of origin are malignancies of head and neck region and lung [10-14]. Peripheral lymphadenopathy is one of the common conditions associated with HIV infection. FNAC is regarded as the gold standard initial investigation in the diagnosis of condition responsible for peripheral lymphadenopathy. Among 247 cases HIV status was positive in 12 cases. Cervical lymph nodes were most commonly involved. Tubercular hyperplasia was the most common cytological diagnosis followed by reactive hyperplasia. Similar finding was seen in study of Kumar et al. In the present study female preponderance was seen, while in study of Kumar et al males outnumbered females. This may be due to geographical variations [16]. Out of a total 247 cases of lymph node aspirations 6 lymph node excision biopsy was done and available for histopathological study and correlation. Amongst them were 2 cases of granulomatous lymphadenitis, both on cytological and histopathological evaluation. 1 case was of metastatic squamous cell carcinoma and 1 case of metastatic adenocarcinoma on cytological and histopathological evaluation. Out of 11 cases diagnosed as Non-Hodgkin's lymphoma excision biopsy was done in 2 cases. Both of these cases were diagnosed as Non-Hodgkin lymphoma. The overall accuracy of the procedure was 100% in the present study. Similar

results were seen in study of Khursid et al. While in study of Satish et al the diagnostic accuracy was found to be 90% [12,15]. Bilal JA et al determined the causes of CLA in Sudanese children and to evaluate the value of routine laboratory tests in determining the etiology. Demographic and clinical data were prospectively collected from eighty children with palpable cervical nodes. Children were then subjected to complete blood count, ESR, Mantoux test, aspiration cytology of a lymph node and serological tests for HIV agglutination test, ELISA for Epstein-Barr virus and toxoplasma gondii. The age ranged 1-13 years with a mean of 5.8 ± 3.1 SD years with no gender difference. Specific etiologies of CLA were determined in 62.5% of patients. Ninety five percent of the causes were due to non-specific reactive hyperplasia of lymph nodes (NSRH) (37.5%), toxoplasmosis (27.5%), infectious mononucleosis due Epstein-Barr virus (13.8%), tuberculous adenitis (10%), acute adenitis (6.2%), whereas malignancy (Hodgkin's lymphoma) constituted 5% of causes of CLA. The clinical characteristics were insignificantly associated with the causes of lymphadenopathy ($p > 0.05$). However, mobile lymph nodes were significantly associated with inflammatory conditions ($P < 0.05$) [17].

Conclusion

FNAC is a simple, rapid & accurate diagnostic technique in evaluation of lymphadenopathies. It helps the clinicians to take early decision for management and avoid unnecessary surgery.

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