

CYTOMORPHOLOGICAL EVALUATION OF LYMPHADENOPATHY ON FINE NEEDLE ASPIRATION CYTOLOGY- A HOSPITAL BASED RETROSPECTIVE STUDY

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ABSTRACT: INTRODUCTION: Lymphadenopathy is a common and frequent clinical problem and is associated with negligible to very serious underlying pathology. FNAC is regarded as a simple, safe and minimally invasive screening procedure with early documentary evidence of nature of lesion.

METHODS AND MATERIAL: The study was conducted on 297 patients presented with significant lymphadenopathy and subjected for FNAC for the same from January 2013 to December 2013.

RESULTS AND OBSERVATION: In this retrospective observational study maximum patient were less than 40 years constituting 61.27% with M: F ratio of 1.65:1. The most frequently involved lymph node was of the cervical region followed by the supraclavicular lymph node. Reactive hyperplasia was the commonest cause of lymphadenopathy followed by metastatic carcinomas. Squamous cell carcinoma contributing (14.14%) of cases followed by adenocarcinoma contributing 10.43%. Granulomatous inflammation contributed 22.55% of cases where 9.42% showed positivity for tubercular bacilli on AFS stain and were reported as tubercular lymphadenitis. **CONCLUSION:** Lymphadenopathy is commonly caused by benign disease and FNAC offers early cytodiagnosis in most of the cases and gives appropriate direction towards ancillary investigation modality in rest of the cases.

KEYWORDS: FNAC of lymph node, Cytomorphology of lymph node

INTRODUCTION: Human beings have approximately 600 lymph nodes some of which are like submandibular, axillary or inguinal may normally be palpable in healthy people.^[1] Lymph nodes are encapsulated kidney shaped organ composed of lymphoid tissues that are distributed throughout the body along the course of lymphatic vessel and play an important role in the body defense against microorganism and spread of tumor cells.^[2]

Lymphadenopathy refers to nodes which are abnormal in size, consistency and number.^[3] The degree and pattern of the morphological changes are dependent on the inciting stimulus and the intensity of the response. So, lymphadenopathy may be an incidental findings and/or primary or secondary manifestation of underlying diseases which may be neoplastic or non-neoplastic.^[4]

The underlying etiology of lymphadenopathy can be diagnosed by good clinical history and examination, radiological examination, cytology, histology and other lab investigations. In all, FNAC offers an immediate, preliminary, reliable, minimally invasive and cost effective diagnostic modality to find out the cause of lymphadenopathy.

OBJECTIVE OF STUDY: The present study was undertaken to analyze the cytomorphological pattern of various diseases process involving the lymph node.

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MATERIAL AND METHODS: The present retrospective study was conducted in the pathology department of SRMS-IMS over a period of one year from January 2013 to December 2013 and total of 297 patients were selected who presented to the department with palpable localized or generalized lymphadenopathy from ward / or OPD basis.

Superficial lymph nodes were aspirated in the cytology section of department of pathology using 22-23 gauge needles under aseptic conditions with informed consent of the patients. Before doing the procedure brief history of the patients, any other complaints/ any investigation done previously were recorded. In some cases where deep seated abdominal lymphadenopathy was reported on ultrasound, aspiration was done under radiological guidance using 22-23 G spinal needle.

Multiple passes were done and obtained material was smeared on slides to be stained routinely with MGG and PAP. For wet fixed slides material aspirated were immediately immersed in 95% ethanol for fixation and further staining by Papani Colaou method (PAP). The air dried smears were routinely stained by May Grunwald Gimesa (MGG) stain. Special stains like Ziehl - Neelson (Z N) stain for acid fast bacilli (AFB) and Alcian blue - PAS for mucin were applied where ever required. All the stained smears were reported by cytopathologist and the diagnosis was solely based on cytomorphological evaluations of aspirated smears under study in the background of relevant clinical findings.

RESULTS AND OBSERVATIONS:

- 1) A total of 297 patients visited our hospital in one year were studied. Out of 297 patients who presented with superficial or deep lymphadenopathy, 185 were male and 112 were female with a M: F ratio of 1.65:1.
- 2) The study subjects were in the age group of 1 year - 90 years. The age group affected most frequently was 11 - 20 years followed by 21-30, 1-10 and 41-50 years. 61.27% of cases were of less than 40 years of age. (Table - 1).

Sl. No.	Range	Frequency/ Percentage
1	1-10	44(14.81%)
2	11-20	57(19.19%)
3	21-30	45 (15.15%)
4	31-40	36 (12.12%)
5	41-50	44(14.81%)
6	51-60	29(9.76%)
7	61-70	32(10.77%)
8	71-80	9(3.03%)
9	81-90	1(0.33%)

Table 1: Age wise distribution

- 3) The commonest lymph node affected was cervical contributing 68.01% followed by supraclavicular (8.75%), inguinal (8.08%), abdominal (6.73%), axilla (6.39%) and epitrochlear lymph node (0.67%). In 4 patients aspiration was done from multiple sites (1.34%). (Table - 2).

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Sl. No.	Site	Frequency
1	Cervical	202 (68.01%)
2	Supraclavicular	26 (8.75%)
3	Inguinal	24 (8.08%)
4	Abdominal	20 (6.73%)
5	Axilla	19 (6.39%)
6	Epitrochlear	2 (0.67%)
7	Multiples site	4 (1.34%)

Table 2: Site wise distribution

4) Out of 297 patients under study, 165 patients were diagnosed as having benign lesion contributing 55.55% of cases. The reactive hyperplasia constituted the major group and was found in 82 cases (27.60%) followed by granulomatous inflammation(22.55%). 39 cases were having granulomatous inflammation with negative AFS for tubercular bacilli. 28 cases were having granulomatous inflammation with positive AFS for tubercular bacilli. 16 were diagnosed as suppurative lesion.

93 cases were diagnosed as metastatic carcinoma. 18 cases were diagnosed as lymphoproliferative disorders favouring lymphoma out of which 15 were Non-Hodgkin's and 3 were Hodgkin's lymphoma. 1 case of metastatic osteosarcoma was also found. 3 cases were reported as suspicious favouring malignant lesion. 17 aspirates were found bloody and no opinion were drawn and reported as inconclusive. (Table - 3)

Sl. No.	Cytological diagnosis	Frequency/ Percentage
1	Reactive	82 (27.60%)
2	Granulomatous(AFS negative)	39 (13.13%)
3	Granulomatous (AFS positive)	28 (9.42%)
4	Suppurative	16 (5.38%)
5	Hodgkin's lymphoma	3 (1.01%)
6	Non-Hodgkin's lymphoma	15 (5.05%)
7	Metastatic carcinoma	93 (31.31%)
8	Metastatic sarcoma	1(0.33%)
9	Suspicious	3 (1.01%)
10	Inconclusive	17 (5.72%)

Table 3 : Cytological diagnosis wise distribution

5) Benign lesion is most common in cervical region followed by inguinal, abdominal, supraclavicular, axillary and epitrochlear area.(table-4)

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Benign	Cervical	Supra Clavicular	Axillary	Abdominal	Ingunial	Epitrochlear	Multiple sites
Reactive	63	-	2	5	10	1+1with microfilaria	-
Granulomatous AFS -ve	29	4	2	-	4	-	-
Granulomatous AFS +Ve	23	2	1	-	1	-	1
Suppurative	14	1	-	1	-	-	-
Inconclusive	9	-	-	2	1	-	-

Table 4: Distribution of benign condition region wise

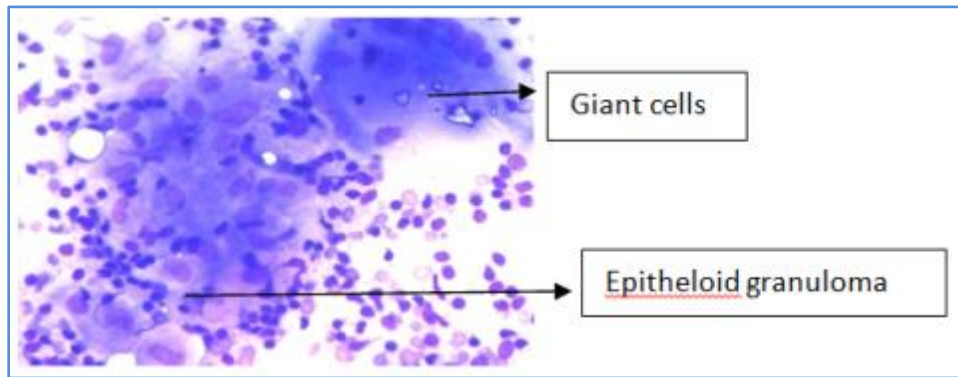


Fig. 1: Epitheloid granuloma with giant cells (MGG 40x)

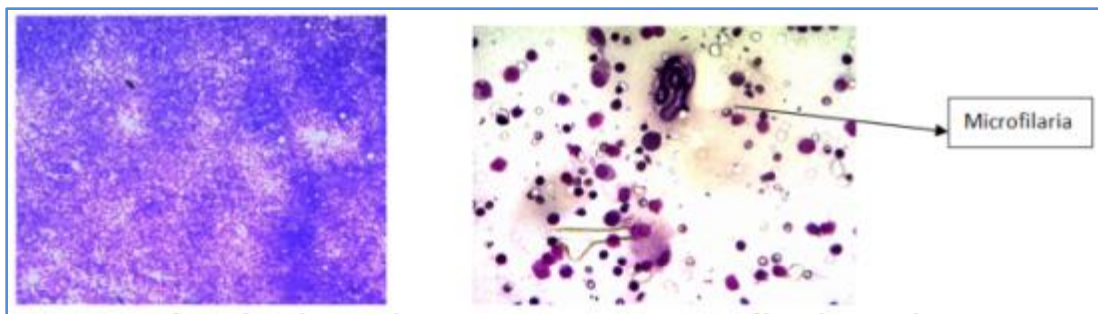


Fig. 2: Reactive hyperplasia (MGG 10X)

Fig. 3: Microfilaria (MGG 10X)

- 6) Cervical lymphadenopathy is the most common site for metastatic lymphadenopathy and most commonly caused by squamous cell carcinoma. Supraclavicular lymphnode is the 2nd most

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commonly affected site and commonly by adenocarcinoma. The most frequent malignant lesion causing lymphadenopathy was squamous cell carcinoma followed by adenocarcinoma. (table-5)

Malignant lesion	Cervical	Supraclavicular	Axillary	Abdominal	Inguinal	Multiple sites
Squamous cell carcinoma	34	4	2	-	2	-
Adenocarcinoma	6	12	9	4	-	-
Poorly differentiated carcinoma	10	1	-	-	2	-
NHL	5	-	3	2	2	3
HL	2	-	-	1	-	-
Anaplastic carcinoma of thyroid	1	-	-	-	-	-
Carcinoma ex pleomorphic adenoma (parotid)	1	-	-	-	-	-
Nasopharyngeal carcinoma	2	-	-	-	1	-
Small cell carcinoma	-	2	-	-	-	-
Urothelial carcinoma	-	-	-	1	-	-
Osteosarcoma	-	-	-	-	1	-
Suspicious	3	-	-	-	-	-
Inconclusive	-	-	-	4	1	-

Table 5: Site and incidence of malignant lesion

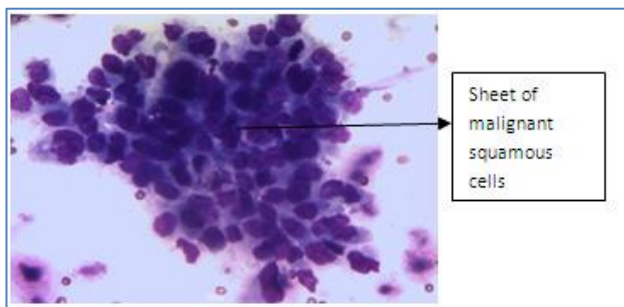


Fig. 4: Squamous Cell Carcinoma(MGG 40X)

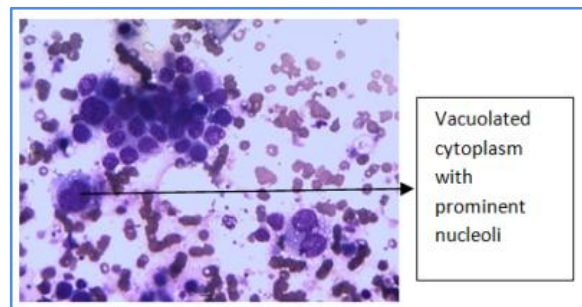


Fig. 5: Adenocarcinoma (MGG 40X)

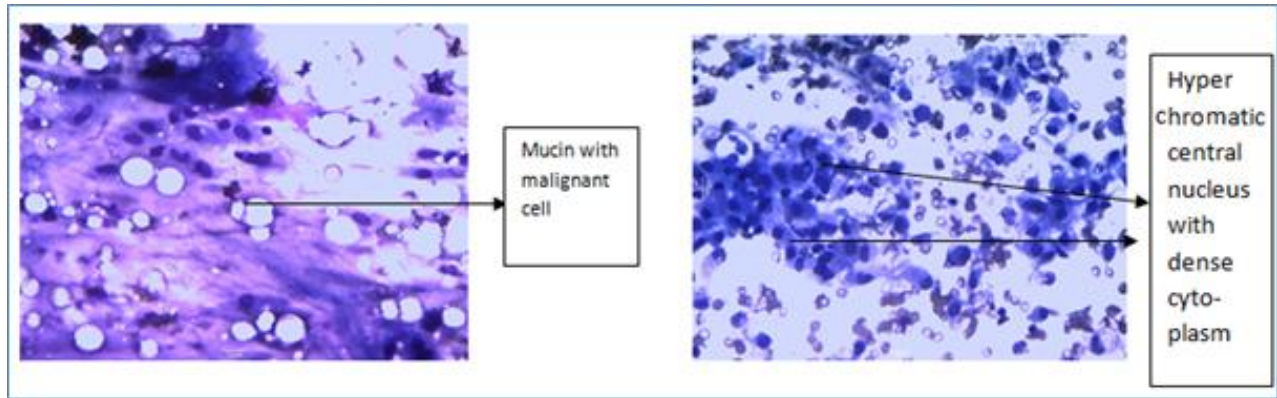


Fig. 6: Adenocarcinoma (Mucin Producing) (MGG 40X)

Fig. 7: Metastatic Urothelial Carcinoma (MGG 40X)

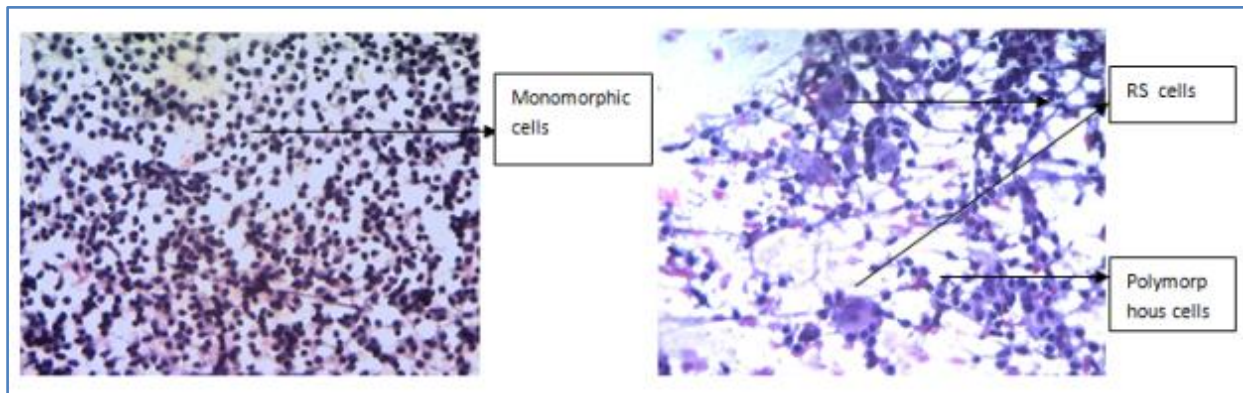


Fig. 8: Non Hodgkin's Lymphoma (PAP 40X)

Fig. 9: Hodgkin's Lymphoma (PAP 40X)

DISCUSSION: Lymphadenopathy is a clinical manifestation of local and systemic diseases which serves as an excellent clue to the underlying diseases process.^[5] In majority of patients, FNAC of lymph nodes serves as an excellent and rapid first line investigation modality to establish the nature of lesion. We conducted a retrospective study in pathology department of SRMS-IMS over a period of one year from January 2013 to December 2013 and 297 patients were selected who presented with palpable, localized or generalized lymphadenopathy.

Out of 297 patients presented with superficial or deep lymphadenopathy, 185 were male and 112 were female with a sex ratio of 1.65:1. Quadri S K. et al.^[1] found sex ratio of 1.5:1, Hirachand S. et al.^[6] got a sex ratio of 1:0.9 whereas Nidhi et al.^[7] and Ageep et al.^[8] found slightly increased in numbers of female patients with M: F ratio of 1:1.2. The study subjects were in the age group of 1 year - 90 years. The age group commonly affected in this study was 11- 20 years. 61.27% patients were less than 40 years. Khajuria R et al.^[9] conducted a study on 656 patient and showed 79.57% were in the age group less than 40 years of age. Kochar A et al.^[10] in their study showed 43.33% in the above age group.

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In this study, the commonest lymph node affected was cervical contributing 68.01% followed by supraclavicular (8.75%), inguinal (8.08%), abdominal (6.73%), axilla (6.39%) and epitrochlear lymph node (0.67%). Pandit et al.^[11] Ahmad et al.^[12] Nidhi et al.^[7] and Kochar A et al.^[10] also found cervical lymph node as the most common site of involvement. Out of 297 patients, 165 cases were reported benign and constituted 55.55%. Another retrospective study which was conducted on 1597 cases with lymphadenopathy in department of pathology, Sher -I -kashmir institute of medical sciences during 2009 to 2011 found 50.5% cases to be benign.^[1] Ahmad et al.^[12] reported 86.4% benign lesion.

In the benign lesion pattern, reactive lymphoid hyperplasia was the commonest cytological diagnosis constituting 27.60% followed by granulomatous pattern in 67 cases (22.55%). Out of 67 cases of granulomatous lymphadenitis characterized by epitheloid granuloma with or without giant cells and with or without necrosis, AFS for tubercular bacilli was found in 28 cases (9.42%) and reported as tubercular lymphadenitis. Hirachand et al.^[6] reported 41.55% reactive lymphadenopathy followed by tubercular lymphadenitis in 28% and granulomatous in 9.2%. Shakya et al.^[15] reported 50.4 % of reactive lymphadenitis followed by 22.4% of tubercular lymphadenitis.

In contrast to the findings in the present study Khajuria R et al.^[9] and Kochar A et al.^[10] reported 52.3 % and 35.33% of tubercular lymphadenitis as the commonest cause followed by reactive hyperplasia constituting 37.2% and 25.33%. A study from Sudan conducted by Ageep et al.^[8] also found tubercular lymphadenitis(39.5%) as the commonest cause of lymphadenopathy followed by metastatic carcinoma (24.7%).

In the present study acute suppurative lesion constituted 5.38% which was comparable with the study done by other workers, Patra et al.^[17] reported 5.8%, 3% by Hirachand et al.^[6] and 4% by Kochar A et al.^[10]. Khajuria R et al.^[9] and Bhaskaran et al.^[18] reported a bit lower incidence of suppurative lymphadenitis, 1% and 1.5% respectively. In the present study all the cases of suppurative lymphadenitis were stained with AFS for tubercular lymphadenitis and were grouped accordingly.

In the present study malignant lesion including metastatic malignancy and lymphoma contributed 115 cases, out of which 93 cases (31.64%) were reported as metastatic carcinoma whereas one case was of metastatic osteosarcoma. 3 cases were highly suspicious for malignant neoplasm. Similar reports were observed by Kochar A et al.^[10] and Qadri Sk et al.^[1] They have reported 32.6% and 38.2 % of metastatic lymphadenopathy respectively.

In one study from Pakistan, Javed et al.^[13] found 42.8% of metastatic malignancy as the commonest cause of lymphadenopathy. Steel et al. found metastatic malignancy in 53.8% cases and this is supported by other western studies.^[14]

The most frequently diagnosed metastatic malignancy was squamous cell carcinoma contributing 14.14% followed by adenocarcinoma in 10.43 % and poorly differentiated carcinoma in 4.04%. In most of the cases the cytomorphological features are highly characteristic for typing the tumor. The most frequently involved site for metastatic malignancy was cervical group of lymph node followed by supraclavicular lymph node.

Study done by Qadri S K et al.^[1] also found the similar findings where squamous cell carcinoma was the commonest metastatic malignancy (32.2%) followed by adenocarcinoma (22%) and the site was cervical lymph node. Similar findings were observed by Kochar A et al.^[10] where SCC was the commonest metastatic carcinoma (81.63%) followed by adenocarcinoma (6.12%) in the cervical

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lymph node. Other studies by Khajuria R et al., Hirachand S et al. and Wilkinson et al.^[16] also found squamous cell carcinoma as the most common metastatic malignancy.

Lymphoma including HL and NHL was found in 18 cases (6.06%) which was comparable with the observation made by Fatima et al.^[19] 5.2%, Hirachand S et al.^[6] 6.1% and 4.5% by Ahmad et al.^[12]. In present study NHL contributed 5.05% and HL contributed 1.01% which was comparable with the Indian study, Patra et al.^[17] NHL (4.8%) and HL (1.01%), Bhaskaran et al.^[18] NHL (2.23%) and HL (0.74%). In sharp contrast to this a study from Egypt by Hafez et al.^[20] reported that cases suspicious for NHL were 32.5% contributing to most common cause of lymphadenopathy.

CONCLUSION: The present study highlighted the various cytomorphological pattern of lymphadenopathy and revealed a huge burden of benign lymph node with a common predilection to cervical area. Reactive hyperplasia is the commonest cytomorphological abnormality commonly affecting young one whereas malignant lymphadenopathy affect middle age to elderly age group. FNAC offers preliminary screening and tissue diagnosis which can be supplemented with relevant investigation modality if clinically indicated.

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LIST OF ABBREVIATIONS:

FNAC	FINE NEEDLE ASPIRATION CYTOLOGY
SCC	SQAMOUS CELL CARCINOMA
NHL	NON HODGKIN'S LYMPHOMA
HL	HODGKIN 'S LYMPHOMA

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