JK SCIENCE pISSN: 0972-1177

ORIGINAL ARTICLE

Cytomorphological Patterns Of Malignant Lymph Nodes In A Tertiary Care Centre

Aishvarya Jandial, Subhash Bhardwaj, Akhil Mahajan[1]

Abstract

Background: The lymph nodes function as an antigen filter for the reticuloendothelial system. They form part of immune system and function to fight disease and infections. Thus, clinical recognition and urgent diagnosis of palpable lymphadenopathy is of paramount importance. The aim of this study was to analyse the cytomorphological patterns of malignant lymph nodes by using FNAC. **Material and Methods:** This is an observational study which includes fine needle aspiration cytology of 160 cases of lymphadenopathy presenting to the department of pathology for 2 years. **Results:** A total of 160 malignant lymph node lesions were aspirated, of which 127 (79.38%) were of metastatic origin and 33 (20.63%) were reported as lymphomas. The most common metastatic malignancy reported was squamous cell carcinoma (62.98%). The cervical lymph node was the most commonly involved lymph node. **Conclusion:** The head and neck was reported as the most common primary site in case of metastatic squamous cell carcinoma. FNAC is an effective, reliable and safe diagnostic modality for the diagnosis of malignant lymph node lesions.

Key Words

Fine Needle Aspiration Cytology (FNAC), Lymphadenopathy, Malignancy, Metastatic

Introduction

Lymphadenopathy can be caused by proliferation of cells intrinsic to the node, such as lymphocytes, plasma cells, monocytes or histiocytes or infiltration of cells extrinsic to the node such as neutrophils and malignant cells. [1] Lymphadenopathy may be the first sign of malignancy and use of FNA in the diagnosis of metastatic disease is well established. In patients with enlarged lymph nodes and previously documented malignancy, FNAC can obviate further surgery performed merely to confirm the presence of
metastasis. Lymphadenopathy is a common presentation in neoplastic conditions like primary lymphoid malignancies which are malignant neoplasm of cells native to the lymphoid tissue, B-cells, T-cells, NK cells and histiocytes, their precursors and their derivatives and are broadly divided into Hodgkin's lymphoma and non-Hodgkin's lymphoma while secondary lymph nodal malignancies are the result of metastases from various malignancies like lung cancer, breast cancer, prostate cancer, urinary bladder cancer, oral cavity cancers and gastrointestinal tract cancers. [2] Lymphadenopathy can be either acute or chronic. In acute condition, the nodes are enlarged and tender along with various constitutional symptoms like fever, malaise, local pain and tenderness whereas in chronic cases, the nodes are usually painless and nontender with delayed development of constitutional symptoms. To diagnose the cause of lymphadenopathy,

Post Graduate Departments of Pathology & [1]G Medicine, Government Medical College, Jammu, J&K India

Correspondence to: Dr. Aishvarya Jandial, Address: House no 58, sector 1A, Channi Himmat Colony, Jammu, Jammu & Kashmir, India

Manuscript Received: 28 Aug 2021; **Revision Accepted**: 17 Dec 2021;

Published Online First: 10 Jan 2022

Open Access at: https://journal.jkscience.org

Cite this article as: Jandial A, Bhardwaj S, Mahajan A. Cytomorphological Patterns of Malignant Lymph Nodes In A Tertiary Care Centre. JK Science 2022;24(1):23-27

medical history like the presence of B symptoms (fever, night sweats, unexplained weight loss>10% over 6 months) and other symptoms like fatigue, pruritus are quite helpful in reaching towards a diagnosis.[3] Along with medical history different diagnostic modalities being used are computed tomography (CT), magnetic resonance imaging (MRI), fine needle aspiration cytology (FNAC) and image guided core needle biopsy. [4] Among these FNAC is cheaper, safer, cost effective and faster technique with a high degree of accuracy. [5] FNAC in combination with immunophenotypic and genotypic studies has gained significant importance in providing an accurate diagnosis of malignant lymphoma in selected risk patients. Inspite of remarkable advances made in diagnostic procedures, the fine needle aspiration cytology has still occupied a significant role in diagnosing the etiology of lymphadenopathy.

Material and Methods

This is a 2 years observational study conducted from 1-11-2018 to 31-10-2020 in the Department of Pathology, Government Medical College and associated hospital, Jammu after getting valid, informed consent from the patients and after getting permission from the institutional ethics committee vide number: IEC/Pharma/Thesis/Research/2019/762. It includes 160 cases of lymphadenopathy, diagnosed as malignant on FNAC. After taking all aseptic precautions FNAC was carried out using a 22-24 gauze disposable needle and 10 ml syringe. Slides were stained with May Grunwald Giemsa (dry fixation) and Papanicolau stain (wet fixation). A thorough relevant history was taken along with complete local examination of the palpable lymph nodes and their location, size, consistency was noted. For superficial lymphadenopathy, direct fine needle aspiration was performed and for deep seated lymphadenopathy like those in retroperitoneum or in the mediastinum, ultrasound guided or CT guided FNAC was performed.

Inclusion Criteria:

1. All patients of lymphadenopathy diagnosed as malignant oncytology.

Exclusion Criteria:

1. All the cases of benign lymphadenopathy.
2. Cases with inadequate smears and which were not optimally preserved.
3. Abnormal coagulation profile in case of image guided FNAC.

Results

The present study included 160 cases who presented with lymphadenopathy, had undergone FNAC and were labelled as malignant. The age of the patients ranged from 5- 95 years with the mean age of 53.56 years. Out of 160 patients, 155 patients had undergone unguided FNAC whereas 5 patients had undergone image guided FNAC. In our study majority of patients (31.25%) were in the age group of 51-60 years. Males predominated the study group thus constituting 73.13% (117 cases) whereas females constituted 26.88% (43cases) with a male: female ratio of 2.7:1. Cervical group of lymph nodes were the most commonly involved lymph nodes that had presented as lymphadenopathy in 82 cases (51.25%), followed by supraclavicular 24 cases (15%), submandibular 23 cases (14.38%), posterior triangle 10 cases (6.25%), axillary 7 cases (4.38%), inguinal 6 cases (3.75%), preauricular and infraauricular 3 cases (1.88%) each, post auricular and retroperitoneal 1 case each (0.63%). Out of 160 cases labelled as malignant, 33 cases were labelled as lymphoma, thus constituted 20.63% of the total cases and the rest 127 cases were labelled as metastatic, which further constituted 79.38%. In this study, 32 cases were labelled as non-Hodgkin's lymphoma (NHL). Of these, 11 cases

Fig. I FNA Smears From Cervical Lymph Node Showing Mixed Small and Large Lymphoid Cells in a Case of Non-Hodgkin's Lymphoma (MGG 400x). Fig. II FNA Smears from Cervical Lymph Node Showing Low Grade Non-Hodgkin's Lymphoma (Pap 400x). Fig. III FNA Smears From Posterior Triangle Lymph Node Showing Classical Reed-Sternberg Cells in a Case of Hodgkin Lymphoma (Pap 400x).

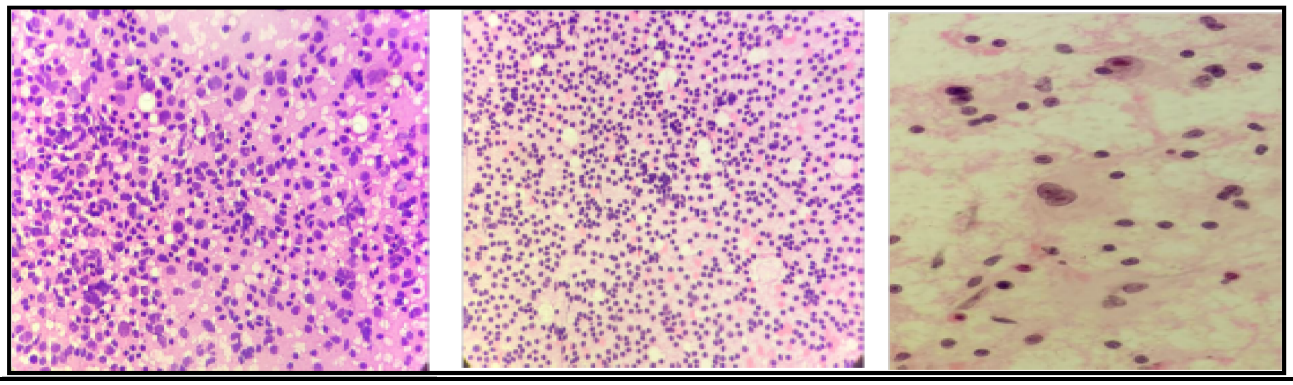


Table -1 Age Wise Distribution of Patients

Age (years)	Frequency	Percentage
<=10	4	2.50%
11-20	2	1.25%
21-30	13	8.13%
31-40	14	8.75%
41-50	28	17.50%
51-60	50	31.25%
61-70	35	21.88%
71-80	10	6.25%
>80	4	2.50%
Mean ± SD	53.56 ± 16.5	
Median (25th-75th percentile)	56 (45-65)	
Range	5-95	

Fig 1. Bar Graph Showing Distribution of Aspirated Lymph Nodes

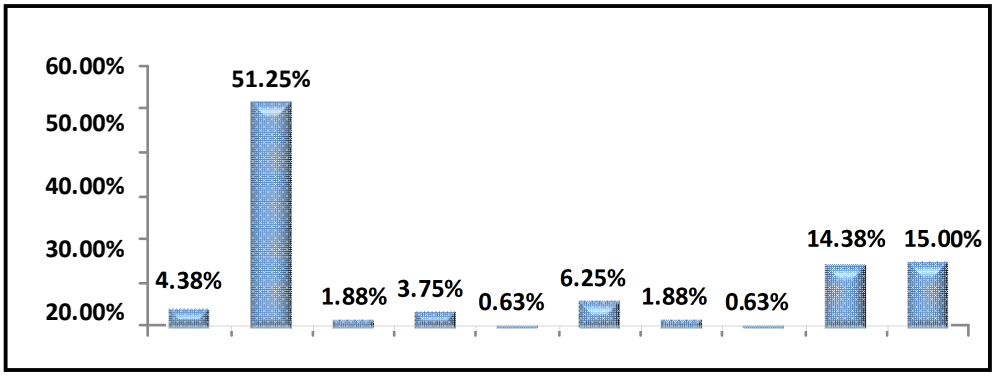


Fig 2. Pie Chart Showing Distribution of Malignancies in Patients

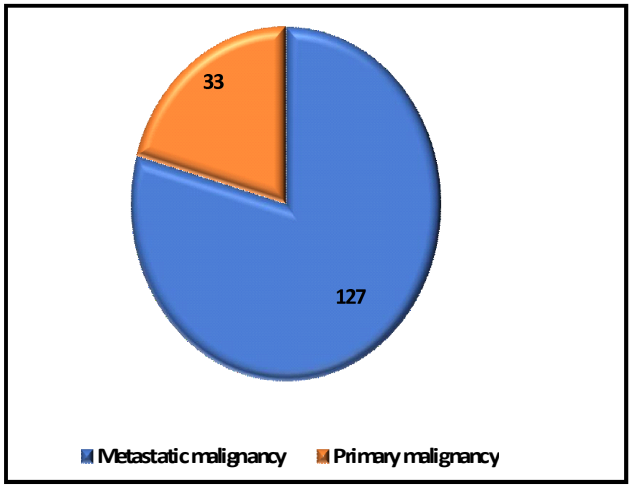
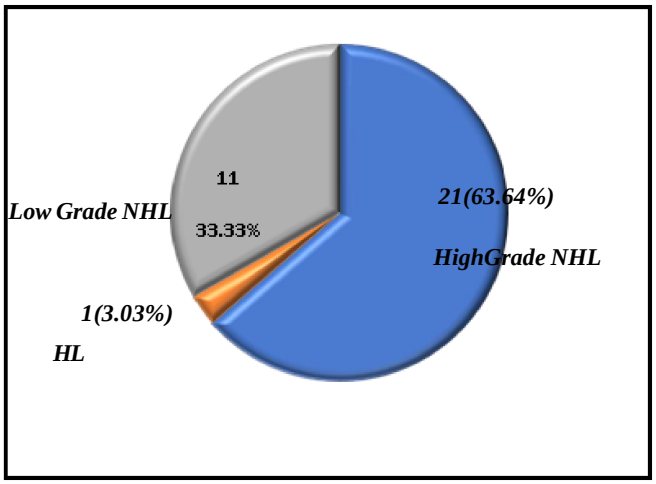


Fig 3. Pie Chart Showing Distribution of Primary Malignancies in Patients



(33.33%) were labelled as low grade NHL and 21 cases (63.34%) as high grade NHL. There was 1 case of Hodgkin Lymphoma which constituted 3.03 %. Out of 127 cases of metastatic malignancies, squamous cell carcinoma was the most commonly diagnosed metastatic malignancy and was seen in 80 patients (62.98%) followed by poorly differentiated carcinoma in 25 patients (19.69%), adenocarcinoma in 15 patients (11.81%), small cell carcinoma in 2 patients (1.57%), malignant melanoma, nasopharyngeal carcinoma, olfactory

Table 2. Distribution of Metastatic Malignancies in Patients

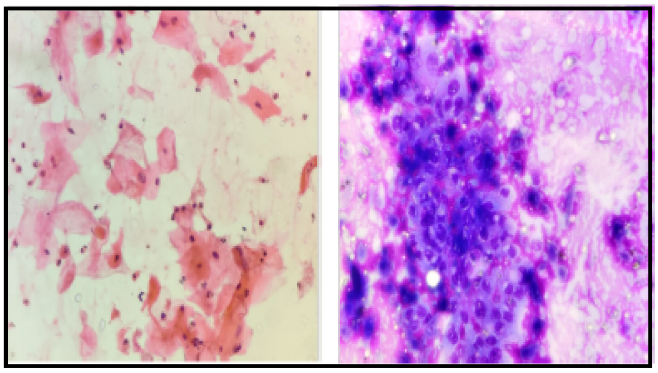
Metastatic malignancy	Frequency	Percentage
Metastatic Squamous cell carcinoma	80	62.98%
Metastatic Adenocarcinoma	15	11.81%
Metastatic Poorly differentiated carcinoma	25	19.69%
Metastatic Small cell carcinoma	2	1.57%
Metastatic Malignant melanoma	1	0.79%
Metastatic Nasopharyngeal carcinoma	1	0.79%
Metastatic Olfactory neuroblastoma	1	0.79%
Metastatic Renal cell carcinoma	1	0.79%
Metastatic Rhabdomyosarcoma	1	0.79%
Total	**127**	**100.00%**

neuroblastoma, renal cell carcinoma and rhabdomyosarcoma in 1 patient (0.79%) each. (*Table1,2 & Fig 1-4*)

Discussion

The burden of primary and secondary lymph nodal malignancy is rising worldwide as well as in India. So FNA acts as a valuable tool which saves a lot of time and enables the clinician to plan the treatment accordingly. The present study was carried out to properly quantify these malignancies and to describe the cytomorphological features by using FNAC. Symptoms and signs, although indicative of etiology, are not a substitute for morphological diagnosis so here FNAC offers various advantages. It is minimally invasive, produces a speedy result and is inexpensive. [6] Enlarged lymph nodes are a prime target for fine needle aspiration. The main importance of FNAC is that, this simple diagnostic procedure can be easily performed in any peripheral center with minimal resources. [7] The set up does not require any sophisticated machinery and can be performed in day care settings. This way majority of cases can be easily managed on FNAC. [8] In the present study the age of the patients ranged from 5- 95 years. The mean age was 53.56 years which was comparable with study carried out by Chakravarty- Vartak US *et al.* [9] Males predominated the study group with a male: female ratio of 2.7:1 which correlated with study by Vimal S *et al.* [10] The cervical group of lymph nodes were the most commonly involved lymph nodes that had presented as lymphadenopathy which was very similar to studies of Sharma M *et al* [11] Out of all malignant lymph nodes aspirated 127 (79.38%) lymph nodes were of metastatic origin and 33 (20.63%) were of lymphomas. These observations were similar to that of Dowerah *et al.* [12] and Batni G *et al.* [13] Non - Hodgkin's lymphoma was the most common primary malignancy while squamous cell carcinoma was the most common metastatic malignancy.

Fig. 4 FNA smears from cervical lymph node aspirate showing metastatic deposits of well differentiated squamous cell carcinoma (Pap 400x). Fig.V: FNA smears from cervical lymph node aspirate showing metastatic deposits of Poorly differentiated squamous cell carcinoma (MGG 400x).



These observations were comparable to other study carried out by Patro P *et al.* [14] Non Hodgkin's lymphoma is a heterogenous group of lymphoid malignancies.

The overall incidence and frequency of different histological subgroups varies according to age at diagnosis. A number of classification systems are available for NHL, the most common ones being Rappaport System, Luke's and Collin's System, Kiel Classification System, Working Formulation and WHO Classification. In the present study, Working Formulation was used owing to our extensive experience with this classification system and absence of immunophenotyping and flow cytometric techniques.

The 2016 revision of the World Health Organization (WHO) classification of lymphoid neoplasms reflects a consensus among haematopathologists, geneticists, and clinicians regarding both updates to current entities as well as the addition of a limited number of new provisional entities.

The revision clarifies the diagnosis and management of lesions at the very early stages of lymphomagenesis, redefines the diagnostic criteria for some entities, explains the expanding genetic molecular landscape of numerous lymphoid neoplasms and their clinical correlates and refers to investigations leading to more targeted therapeutic strategies.

Conclusion

Hence, proper cytological evaluation is quite useful in diagnosing metastasis with good degree of certainity. FNAC proved to be a useful diagnostic modality in the diagnosis of primary as well as metastatic malignancies due to its rapidity of diagnosis, ease of performance and

minimal complications. FNAC is an advantageous, economical and convenient alternative to surgical biopsy of lymph nodes; whose diagnostic accuracy can be further improved manifold when used in collaboration with other special techniques like immunocytochemistry, ultrastructural studies and cytogenetic parameters.

Financial Support and Sponsorship
Nil.

Conflicts of Interest
There are no conflicts of interest.

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