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Original Article

Cytomorphological Spectrum of Malignant Lymph node Lesions diagnosed by Fine needle aspiration cytology in Tertiary Care Hospital

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ABSTRACT

Background: Lymphadenopathy is a common clinical presentation with etiology ranging from reactive inflammatory conditions to malignant neoplasms. Fine Needle Aspiration Cytology (FNAC) is a simple, rapid, minimally invasive, and cost-effective diagnostic tool for the evaluation of lymph node lesions. Malignant lymph node lesions include various type of Non-Hodgkin lymphoma (NHL), Hodgkin lymphoma (HL)and various metastatic carcinoma like squamous cell carcinoma (SCC), ductal carcinoma of breast etc.
Aim: To evaluate the cytomorphological spectrum of malignant lesions of lymph nodes diagnosed by FNAC in a tertiary care hospital.
Materials and Methods: This hospital-based observational study was conducted in the department of Pathology from January 2024 to December 2024. A total of 50 lymph node aspirates diagnosed as malignant on FNAC were included. FNAC and staining were performed using standard techniques. Cytomorphological features were analysed, and lesions were categorized as primary malignancies and secondary malignancies with their age & sex wise distribution.
Results: Among the 50 malignant lymph node lesions, metastatic malignancies constituted the majority (60%), followed by NHL(30%) and HL (10%) with male predominance. The highest incidence was observed in the 60–69-year age group (34%) with cervical lymph nodes most commonly involved (54%). Among metastatic lesions, SCC was commonly found (50%).
Conclusion: FNAC is a reliable, safe, rapid, and economical diagnostic modality for the evaluation of malignant lymph node lesions. It effectively differentiates primary from secondary malignancies and provides valuable guidance for further diagnostic workup and patient management.

Keywords*: Lymph node lesions, FNAC, Primary malignancy, Secondary malignancy.*

INTRODUCTION

Lymphadenopathy is most common clinical presentation and one of the major cause of morbidity.[1] The causes of lymphadenopathies are vary from inflammatory process to malignant disease.[2] It plays an important role in the diagnosis of both primary and secondary malignant lymph node lesions.[3] FNAC not only confirms the presence of metastatic disease but also gives clues regarding the nature and origin of the primary tumor.[3,4]

It is simple, safe, repeatable, cost effective, relatively less traumatic, without complications and helps the clinician for the initial assessment of malignant lymphadenopathy.[5] FNAC provides rapid preliminary diagnosis based on characteristic cytomorphological features and helps identify cases requiring further histopathological examination and immunohistochemical studies for definitive classification thus aiding in staging, prognosis and therapeutic planning. [6,7] This study was designed to evaluate cytomorphological spectrum of various malignant lymph node lesions like HL, NHL and various metastatic lesions and its age and sex wise distribution.

Aim

To evaluate the cytomorphological spectrum of malignant lymph node lesions diagnosed by Fine Needle Aspiration Cytology (FNAC) in a tertiary care hospital.

Objectives

1. To analyse the cytomorphological spectrum of various malignant lymph node lesions diagnosed by FNAC.
2. To study the age-wise and sex-wise distribution of malignant lymph node lesions.
3. To categorize malignant lymph node lesions into primary malignancies and secondary malignancies.
4. To assess the diagnostic utility of FNAC in the evaluation of malignant lymph node lesions.

Inclusion Criteria:

All patients of lymphadenopathy diagnosed as malignant cytological findings

Exclusion Criteria:

1.All the cases of benign lymphadenopathy
2.Cases with inadequate smears and which were not optimally preserved

MATERIAL AND METHOD

This was the hospital -based observation study, done from January 2024 to December 2024 in department of Pathology at Tertiary care hospital and included 50 lymph node aspirates which were diagnosed as malignant lesions by FNAC.
Patients included in this study after written consent. Patient's age, sex, chief complaints, personal history, past history, family history and site of lymphadenopathy were noted and full clinical examination was done to look out for other lymph node enlargement. FNAC was done from the enlarged lymph node as per standard protocol and nature of aspirate was noted. Cytosmear were made and kept in fixatives. slides were stained with routine stains like Papanicolaou, Geimsa & Hematoxylin &Eosin stain. Cytomorphological finding like cell population, type of necrosis and patterns were noted and also correlated with clinical findings. The data was collected. Cases showing cytological features of malignancy were further categorized into primary malignancy like various type of lymphoma and secondary malignancy including various metastatic malignancy. In cases of lymphoma, lymph node biopsy and IHC were advised for further sub classification. Age & sex wise distribution of various malignant lymph node lesions was carried out.

RESULTS

Total 50 lymph node aspirates, which were diagnosed as malignant lesions by FNAC from January 2024 to December 2024 in department of Pathology at Tertiary care hospital included in present study and results were analysed as follows

TABLE: 1 Cytomorphological diagnosis of malignant lesions of aspirated lymph node

Malignant lymph node lesion	Cytomorphological diagnosis	Number of cases	% of cases
Primary malignancy	Hodgkin's lymphoma	5	10 %
	Non-Hodgkin's lymphoma	15	30 %
Secondary malignancy	Metastasis	30	60 %

Among malignant lesions, most common lesion was of metastatic lesions (60%) followed by NHL (30%). HL was only found in 10 % of cases. In primary malignancy of lymph node, NHL was the most common lesion (15/20 cases).

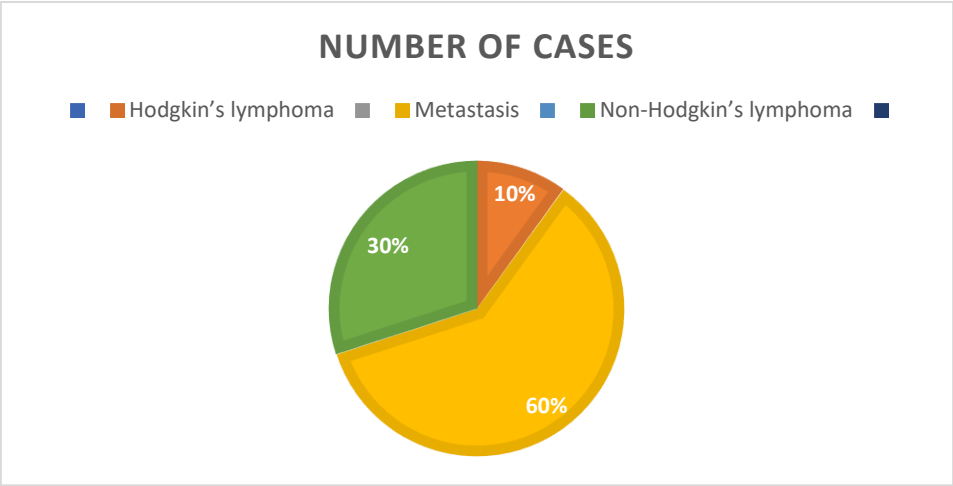


TABLE :2 Sex wise distribution of malignant lymph node lesions

Cytological diagnosis of malignant lymph node lesions	Female	Male	Total number of cases
Primary Malignancy			
Non-Hodgkin's lymphoma (NHL)	3 (20%)	12 (80 %)	15
Hodgkin's lymphoma (HL)	1 (20)%	4 (80%)	5
Secondary Malignancy			
Metastasis	15 (50%)	15 (50%)	30
Total	19 (38%)	31 (62%)	50

On FNAC, male preponderance (62%) observed among 50 cases of malignant lesion comprising of 15 cases of metastasis ,12 cases of NHL lymphoma and followed by 4 cases of Hodgkin's lymphoma. While females also showed metastatic lesions commonly followed by Non-Hodgkin's lymphoma. Both HL and NHL cases mainly found in male sex (80%), while metastasis cases showed equal frequency in both gender.

TABLE :3 Age wise distribution of malignant lesions of aspirated lymph node

Age Group In Years	Primary malignancy		Secondary malignancy	Number of cases	% of cases
	Hodgkin's lymphoma	Non -Hodgkin's lymphoma	Metastasis		
0-9	1	2	0	3	6 %
10-19	3	0	0	3	6 %
20-29	1	0	0	1	2 %
30-39	0	2	1	3	6 %
40-49	0	2	10	12	24 %
50-59	0	2	2	4	8 %
60-69	0	3	14	17	34 %
70-79	0	4	3	7	14 %
Total	**5**	**15**	**30**	**50**	**100 %**

In this study, Malignant lymph node lesion most commonly found in age group 60-69 years followed by 40-49 years and 70-79 years age group.

Total 20 cases showed primary malignant lymph node lesions while 30 cases showed secondary malignant lymph node lesions. Among primary malignancy, NHL cases (15/20 cases) were more common, followed by HL cases. In primary malignancy, NHL observed predominantly in 70-79year age group. HL was predominantly found in age group 10-19 year. Among total 50 cases, secondary malignancy, in the form of metastasis was found in more than 30 years of age and predominantly found in age group 60-69 years (34%) followed by 40-49 years (24%).

TABLE 4: Site wise distribution of malignant lesions of aspirated lymph node

Site of lymphadenopathy	Primary malignancy		Secondary malignancy	Total Number cases	% of cases
	Hodgkin's lymphoma	Non -Hodgkin's lymphoma	Metastasis		
Axilla	0	2	11	13	26 %
Cervical	5	6	16	27	54 %
Post – auricular	0	1	0	1	2 %
Submandibular	0	4	1	5	10 %
Supraclavicular	0	1	2	3	6 %
Inguinal Region	0	1	0	1	2 %
Total	**5**	**15**	**30**	**50**	**100 %**

Most common site in both primary and secondary malignancy was cervical lymph node (54%) followed by axilla and submandibular lymph node.

TABLE 5: Age and sex wise distribution of malignant lesions of aspirated lymph node.

Age group	Hodgkin's lymphoma		Non Hodgkin's lymphoma		Metastasis		Total number cases	% of cases
	F	M	F	M	F	M		
0-9	0	1	1	1	0	0	3	6 %
10-19	0	3	0	0	0	0	3	6 %
20-29	1	0	0	0	0	0	1	2 %
30-39	0	0	1	1	1	0	3	6 %
40-49	0	0	0	2	7	3	12	24 %
50-59	0	0	0	2	2	0	4	8 %
60-69	0	0	1	2	4	10	17	34 %
70-79	0	0	0	4	1	2	7	14 %
Total	**1**	**4**	**3**	**12**	**15**	**15**	**50**	**100 %**

In male cases of HL, most of the cases were found in age group 10-19 year followed by 0-9 year while only one female HL case found in age group 20-29 year. In male cases of NHL, most of the cases were found in age group 70-79 year, while in female NHL cases, different age groups were affected. Among metastatic lesions, female of age group 40-49 year was mainly affected followed by 60-69 year, while in male age group 60-69 year was mainly affected.

TABLE 6: Age group wise distribution of metastatic lesions of aspirated lymph node

Age groups	Metastatic squamous cell carcinoma	Metastatic ductal cell carcinoma	Metastatic poorly differentiated carcinoma	Metastatic undifferentiated carcinoma	Total no. of cases	% of cases
0-9	0	0	0	0	0	0%
10-19	0	0	0	0	0	0%
20-29	0	0	0	0	0	0%
30-39	1	0	0	0	1	3.3 %
40-49	3	6	0	1	10	33.3 %
50-59	0	2	0	0	2	6.7 %
60-69	9	3	1	1	14	46.7 %
70-80	2	0	1	0	3	10 %
Total	**15**	**11**	**2**	**2**	**30**	**100 %**

In metastatic lesions, squamous cell carcinoma was most commonly found in age group of 60-69 year followed by 40-49 year and 70-80 year. In ductal cell carcinoma, most commonly involved age group was 40-49 year followed by 60-69 year.

TABLE 7: Gender wise distribution of metastatic lesions of aspirated lymph node

Cytological diagnosis	Male	Female	Total number of cases	% of total cases
Metastatic Squamous cell carcinoma	11	4	15	50 %
Metastatic ductal cell carcinoma	0	11	11	36.68 %
Metastatic poorly differentiated carcinoma	2	0	2	6.66 %
Metastatic undifferentiated carcinoma	2	0	2	6.66 %
Total	**15**	**15**	**30**	**100 %**

The most common tumor metastasizing to lymph nodes were the squamous carcinoma (50%) followed by ductal carcinoma (36.68%), poorly differentiated carcinoma (6.66%) and undifferentiated carcinoma (6.66%). Metastatic squamous cell carcinoma was most commonly observed in male while in female metastatic ductal carcinoma was observed.

TABLE 8: Site wise distribution of metastatic lesions of aspirated lymph node

Site of FNAC	Metastatic squamous cell carcinoma	Metastatic ductal cell carcinoma	Metastatic poorly differentiated carcinoma	Metastatic undifferentiated carcinoma	Total number of cases	% of cases

Axilla	0	11	0	0	11	36.67 %
Cervical	12	0	2	2	16	53.33 %
submandibular	1	0	0	0	1	3.33 %
supraclavicular	2	0	0	0	2	6.67 %
Total	**15**	**11**	**2**	**2**	**30**	**100.00 %**

In metastatic lesions, squamous cell carcinoma was most commonly found in cervical lymph node followed by supraclavicular and submandibular lymph node. Ductal cell carcinoma was found in axillary lymph node and poorly differentiated and undifferentiated carcinoma were found in cervical lymph node.

DISCUSSION

This hospital-based observational study was conducted in the Department of Pathology from January 2024 to December 2024. A total of 50 lymph node aspirates diagnosed as malignant lesions on FNAC were included. Lesions included various type of NHL, HL, various metastatic carcinoma and their age, sex and lymph node site wise distribution was done. In the present study, metastatic lesions constituted the majority of malignant lymph node lesions (60%), followed by NHL (30%) and HL (10%). This finding is comparable with the studies conducted Jandial et al., who observed metastatic lesions in 79.38% of cases, followed by NHL (20 %) and HL (0.62 %), similar to the studies by Dowrerah et al and Batni G et al.[8,9,10]In present study NHL was the most common primary malignancy (15/20 cases) while The present study demonstrated a male predominance, with 62% males and 38% females, resulting in a male-to-female ratio of 1.6:1. Similar findings were reported by Mishra et al., who also observed male-to-female ratio of 6.1:1 while in Jandial et al it was 2.7:1[8,13].

The most common age group affected in metastatic tumor, in present study was 60-69 years similar as Mishra et al (51-70 years), Bhavani et al, Khajuria et al, Pandav et al.[13,14,15,16]

In present study metastatic lesions, squamous cell carcinoma was most commonly found in age group of 60-69 year (50 %) predominant in male Similarly, Mishra et al. [13] reported maximum cases of squamous cell carcinoma in the 51–60 years of age group (43.7%) predominant in male.

Cervical lymph nodes were the most frequently involved nodal group in the present study, accounting for 54% of cases, followed by axillary lymph nodes (40%). Similar findings have been comparable with findings were reported by Goyal et al. (71.79%), Jandial et al and Sharma M et al.[8,17,18]

In present study metastatic SCC found in 50 % of total metastatic lesion. Similar findings were reported by Jandial et al. (62.98 %).[8]

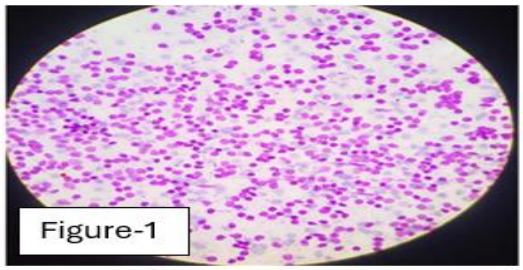
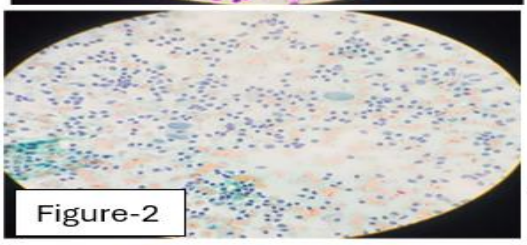


Figure-1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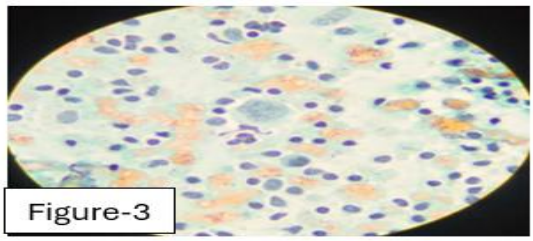
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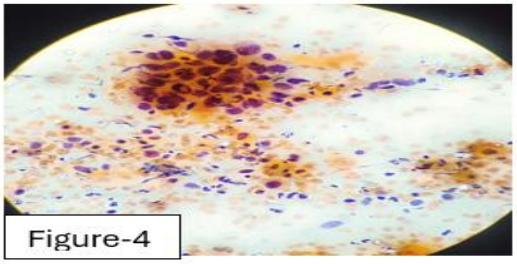
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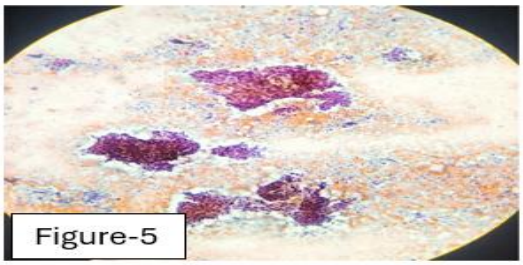
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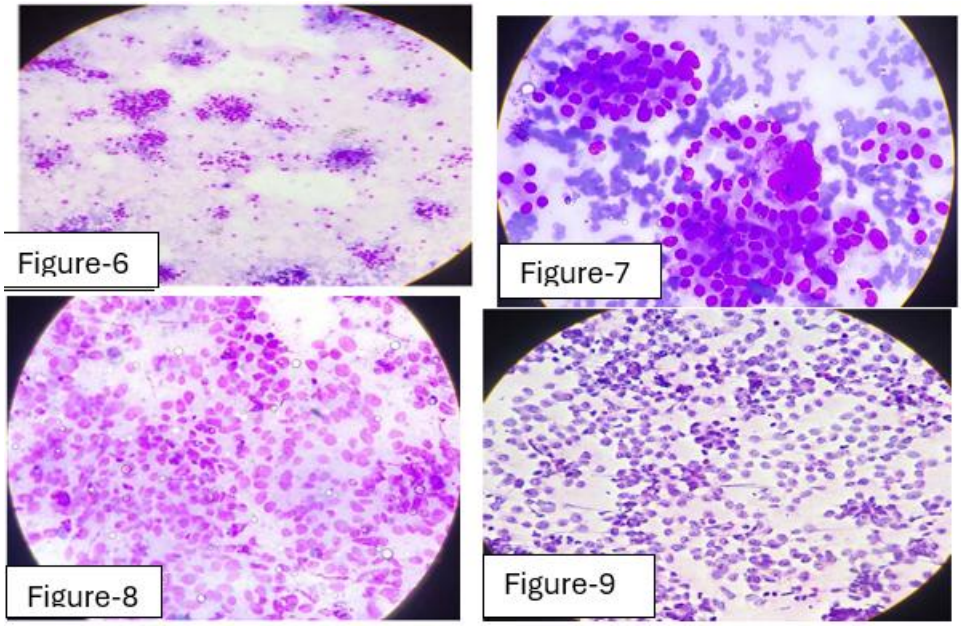

Fig-1: Smear shows monotonous population of slightly enlarged lymphocytes with coarsely granular chromatin (H&E stain -40x) in case of NHL. Fig -2(PAP stain-40x) & Fig-3 (PAP Stain100x): Smear shows mononuclear Reed Sternberg cell in the background of lymphocytes in case of Hodgkin lymphoma. Fig-4 Smear shows well differentiated metastatic squamous cell carcinoma (PAP stain-40x). Fig-5 Smear shows cluster of malignant squamous cell with lymphocytes in the background (PAP Stain10x). Fig-6 Smear shows malignant ductal cells are arranged singly and in groups with scattered lymphocytes in background in case of metastatic ductal carcinoma. (Giemsa stain -40x). Fig-7 Smear shows malignant ductal cells are arranged in groups with intact cytoplasm and one highly pleomorphic cell is seen in the case of metastatic ductal cell carcinoma. (Giemsa stain -40x). Fig-8 Smear shows both loose cohesive groups of cells with fine nuclear chromatin with scattered lymphocytes in background (Giemsa stain -40x) in the case of metastatic poorly differentiated carcinoma. Fig-9 Malignant cells are round to oval, prominent central nucleoli. The cytoplasm is thin, stripped off with blue streaks and scattered lymphocytes seen in smears in the case of metastatic undifferentiated carcinoma. (H&E stain-40x)

Limitations

Cytological evaluation along with proper clinicoradiological correlation is useful in diagnosing malignant lesions of lymph node, However study for longer period with a larger sample size is needed for better representation of the community.

CONCLUSION

In present study, cytological evaluation of 50 lymph node aspirate showed mainly metastatic malignancy followed by Non-Hodgkin lymphoma and Hodgkin lymphoma with male predominance. Metastatic lesions were predominantly observed in patients older than 30 years, while HL mainly found in younger age group.

Metastatic squamous cell carcinoma was the most common metastatic lesion among males, predominantly affecting the 60–69 years age group and most frequently involving the cervical lymph nodes. while, metastatic ductal carcinoma was the predominant metastatic lesion among females, occurring mainly in the 40–49 years age group and most commonly involving the axillary lymph nodes.

The present study proved that FNAC is a useful diagnostic modality in diagnosis of primary as well as metastatic malignancies due to rapidity of diagnosis, ease of performance, minimal complication and convenient alternative of surgical biopsy of lymph node. When FNAC is used in collaboration with special technique like immunocytochemistry and cytogenetic parameters, it increases diagnosis accuracy.

REFERENCE

1. Bazemore, A. W., & Smucker, D. R. (2002). Lymphadenopathy and malignancy. *American Family Physician, 66*(11), 2103–2110.
2. Ferrer, R. (1998). Lymphadenopathy: Differential diagnosis and evaluation. *American Family Physician, 58*(6), 1313–1320.
3. Frable, W. J. (1983). Thin-needle aspiration biopsy. *Human Pathology, 14*(1), 9–28. https://doi.org/10.1016/S0046-8177(83)80129-5
4. Kocjan, G. (2016). *Diagnostic cytopathology essentials*. Elsevier.

5. Orell, S. R., Sterrett, G. F., & Whitaker, D. (2020). *Orell & Sterrett's fine needle aspiration cytology* (6th ed.). Elsevier.
6. Gray, W., & Kocjan, G. (2010). *Diagnostic cytopathology* (3rd ed.). Elsevier.
7. WHO Classification of Tumours Editorial Board. (2022). *WHO classification of tumours of haematolymphoid tumours* (5th ed.). International Agency for Research on Cancer.
8. Jandial, R., et al. (Year). Cytomorphological spectrum of malignant lymphadenopathy diagnosed by FNAC. *Journal Name, Volume*(Issue), Pages.
9. Dowrerah, P., et al. (Year). Cytological evaluation of malignant lymph node lesions. *Journal Name, Volume*(Issue), Pages.
10. Batni, G., et al. (Year). Study of malignant lymphadenopathy by FNAC. *Journal Name, Volume*(Issue), Pages.
11. Patro, P., et al. (Year). Cytological spectrum of metastatic lymph node lesions diagnosed by FNAC. *Indian Journal of Pathology and Oncology, Volume*(Issue), Pages.
12. Wilkinson, A. R., Mahore, S. D., & Maimoon, S. A. (2012). Fine needle aspiration cytology in the diagnosis of lymph node lesions: A study of 50 cases. *Indian Journal of Pathology and Microbiology, 55*(1), 78–81.
13. Mishra, S. D., et al. (Year). Cytological evaluation of metastatic lymphadenopathy by FNAC. *Journal Name, Volume*(Issue), Pages.
14. Bhavani, C., et al. (Year). Cytomorphological study of metastatic lymph node lesions. *Journal Name, Volume*(Issue), Pages.
15. Khajuria, R., Goswami, K. C., Singh, K., & Dubey, V. K. (2006). Pattern of lymphadenopathy on fine needle aspiration cytology in Jammu. *JK Science, 8*(3), 157–159.
16. Pandav, A. B., Patil, P. P., & Lanjewar, D. N. (Year). Cytological evaluation of lymphadenopathy by FNAC. *Indian Journal of Pathology and Oncology, Volume*(Issue), Pages.
17. Goyal, R., et al. (Year). Role of FNAC in diagnosis of lymph node lesions. *National Journal of Laboratory Medicine, Volume*(Issue), Pages.
18. Sharma, M., et al. (Year). Cytomorphological study of lymph node lesions diagnosed on FNAC. *International Journal of Medical Research Professionals, Volume*(Issue), Pages.