



**ORIGINAL RESEARCH PAPER**

**Pathology**

**FINE NEEDLE ASPIRATION CYTOLOGY OF LYMPH NODES - IS IT A BOON?**

**KEY WORDS:** Fine Needle Aspiration Cytology (FNAC).

<b>Dr Vartika Mishra</b>	3rd Year Resident,
<b>Dr Sudha Iyengar</b>	Professor
<b>Dr Rajesh Gaur</b>	Professor And Head of Department
<b>Dr Santosh Jayant*</b>	3rd Year Resident *Corresponding Author

**ABSTRACT**

Fine needle aspiration cytology (FNAC) is a simple and rapid diagnostic procedure to identify etiology in an enlarged lymph node. **Aim:** We studied malignant lymph nodes .Most common site aspirated, age & sex distribution and spectrum of diagnosis was presented in our result. **Methods:** We retrospectively reviewed malignant lymph node aspirates over a period of three years from June 2019 to May 2022 in Department of Pathology, Gajraraja Medical College, Gwalior, India. We excluded tubercular and reactive lymph nodes. **Results:** A total of 1026 lymph node aspirates were identified during this period. 198 cases (12.1%) were identified as malignant. Age distribution was 5 to 88 years. Male to female ratio was 5.8:1. In metastatic lymph nodes Cervical lymph nodes (174/201; 86.56%) were the main group. 173 cases ( 86 %) showed metastatic deposits which was more common compared to 28 cases ( 13.9%) of primary lymphomas. Malignancies, included 143 cases (71.1%) of SCC (metastasis) and 22 cases (78.5%) of Non Hodgkins lymphoma. **Conclusion:** Cervical lymph node was the most common malignant lymph node aspirated. Squamous cell carcinoma and Non Hodgkins lymphoma were the most common primary and secondary malignancies. We can conclude FNAC as a one-step routine OPD procedure as mostly lymph nodes are easily accessible and can be reported within 5 days thus saving time and reducing discomfort of biopsy. Majority of benign etiologies can be triaged, thereby focusing more on malignant cases. FNAC thus proves to be a boon for diagnosing lymph node malignancies.

**INTRODUCTION**

FNAC is a safe, easy and minimally invasive diagnostic procedure which can be performed in office settings [1]. FNAC is gaining popularity as a first line diagnostic procedure. This is cost effective procedure is especially useful in low-resource countries like India. Majority of cases can be diagnosed and managed on FNAC alone [2]. It also helps to triage the selective cases like malignancies which need further work up. It plays an important role to confirm or exclude metastasis in a lymph node in a known case of malignancy, thereby avoiding unwanted surgery. In many other circumstances, FNAC may be the first investigation to clinch a diagnosis of an occult malignancy [3].

The aim of this study was to analyze the spectrum of malignant and primary lymph node malignancies among the various guided FNACs performed in our hospital. The most common site aspirated, the commonest age of presentation , age and sex distribution of various malignancies and the spectrum of diagnosis was presented as our result.

**MATERIALS AND METHODS :**

The present study is a retrospective review of malignant lymph node aspirates including the guided fnacs over a period of two years from June 2019 to May 2022.

FNAC was performed following strict aseptic precautions. Inadequate aspirates were excluded from the study. Relevant clinical details including age, sex of the patient and investigations were noted in all cases.

**Procedure:**

The site and size of the lymph nodes being aspirated was noted before performing the procedure. A 22/23 gauge needle attached to 20ml syringe mounted on Cameco handle was used for obtaining the material. The needle was inserted into the swelling and full suction pressure was applied. The needle was moved briskly in different directions in the swelling till sufficient material was visualized in the stem of the needle. The negative pressure of the syringe was released

and the needle was taken out. The aspirated material was blown out on clean glass slides. At least 4 good aspirate smears were prepared. Two smears were air dried and stained with Giemsa stain. Another two smears were alcohol fixed and stained with Papanicolaou Stain (PAP stain) each.

Smears prepared by usg guided technique from abdominal and mediastinal lymph nodes were received along with full history.

All cytological smears were evaluated for adequacy, cellularity, type of cells, arrangement of cells and nuclear as well as cytoplasmic features. Background was evaluated in all smears for any specific findings like necrosis or presence of mucin.

Statistical analysis The results were collected and analyzed on a Microsoft Excel sheet and percentages were calculated.

**RESULTS**

**Patient Characteristics** A total of 1026 lymph nodes were aspirated during this study period. Out of all these cases, 201 cases (19.6 %) were identified as malignant lymph node aspirates. The age of patients in malignant lymph node aspirates ranged from 5 years to 87 years. There were males 162 ( 80.6 %) and females 39 ( 19.4 % ). The male to female ratio was 5.8:1. Two malignancies ( 0.99%) were identified in pediatric population (< 18 years), 137 cases (68.2%) in adults (18-65 years) and 62 cases ( 30.8% ) in geriatric age group (> 65 years). In malignant lymph nodes Cervical lymph nodes (127/201; 49.7%) were the main group of enlarged lymph nodes identified, followed by submandibular (42/201 , 20.8 %) supraclavicular lymph nodes (08/201; 3.9%), axillary lymph nodes (04/201; 1.9%) and inguinal lymph nodes (11/201; 5.5%) respectively as shown in (Figure 1). Among all 201 cases, 173 cases ( 86 %) showed metastatic deposits and 28 cases ( 13.9%) were identified as primary lymphomas. Among metastatic malignancies, SCC ( 143 cases; 71.1%) was the most common malignancy identified followed by adenocarcinoma ( 20 cases; 9.9%), and single cases of ( 0.5%

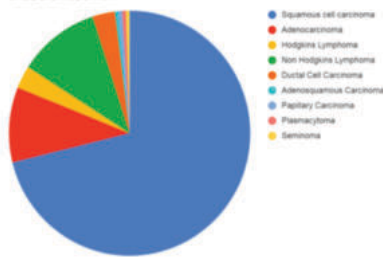
each ) adenoquamous, papillary, mucoepidermoid, seminoma respectively. Twenty eight cases of primary lymphomas were identified on FNAC. These cases were classified as NHL (22 cases , 78.5%) and Hodgkin's lymphoma (6cases , 21.5% ). In non hodkins lymphoma ,fourteen cases ,17 males and 05 cases were identified . Five cases of Hodgkin's lymphoma were identified in males and one case in females. All lymphoma cases were advised excision biopsy for confirmation and immunohistochemistry for further characterization of lymphoma cases.

**Cytological features:**

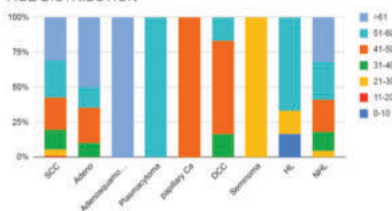
The characteristic cytological features seen in making a diagnosis of. Certain cells on PAP smear revealed orangeophilia. Background revealed necrosis and keratin debris. Forty four cases were identified as adenocarcinoma. These cases revealed clusters of malignant cells with coarse nuclear chromatin, prominent nucleoli and moderate cytoplasm with vacuolations in many. Many cells revealed acinar formation as shown in (Figure 2a). Metastatic deposits from duct cell carcinoma were mainly identified in axillary lymph nodes (08 cases) and one case in cervical lymph node. Cytological features in these cases revealed many single and clusters of malignant cells. Cells revealed moderate to severe nuclear atypia, enlargement, pleomorphism and irregular nuclear chromatin. At places, tubule formation was noted.. One case showed metastatic deposits from papillary carcinoma thyroid. On cytology, these cases revealed papillae with and without fibrovascular cores and sheets of tumor cells. The cells had minimal pleomorphism, powdery nuclear chromatin, nuclear grooves and intranuclear inclusions as shown in (Figure 2b).

Types of Malignancy	Number of Cases
Squamous cell carcinoma	143 (71.1%)
Adenocarcinoma	20 (9.9%)
Hodgkins Lymphoma	06(2.9 %)
Non Hodgkins Lymphoma	22 (10.9%)
Ductal Cell Carcinoma	06 (2.9 %)
Adenosquamous Carcinoma	01 (0.5% )
Papillary Carcinoma	01(0.5%)
Plasmacytoma	01(0.5%)
Seminoma	01(0.5%)

CASE DISTRIBUTION

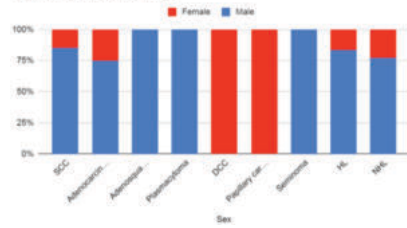


AGE DISTRIBUTION



Age in years	SCC	Adeno	Adeno squamous	Plasmacytoma	papillary Ca	DCC	Seminoma	HL	NHL
0-10	00	00	00	00	00	00	00	01	00
11-20	01	00	00	00	00	00	00	00	00
21-30	07	00	00	00	00	00	01	01	01
31-40	20	02	00	00	00	01	00	00	03
41-50	33	05	00	00	01	04	00	00	05
51-60	38	03	00	01	00	01	00	04	06
>=61	44	10	01	00	00	00	00	00	07

GENDER DISTRIBUTION



Sex	SCC	Adenocarcinoma	Adenosquamous Carcinoma	Plasmacytoma	DCC	Papillary carcinoma	Seminoma	HL	NHL
Male	122	15	01	01	00	00	01	05	17
Female	21	05	00	00	06	01	00	01	05

LOCATION WISE DISTRIBUTION

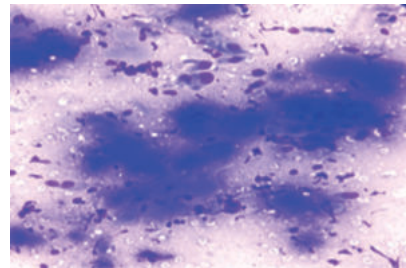
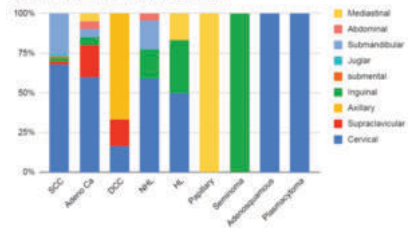


Figure: Keratinizing Squamous Cell Carcinoma MGG stain (400x)

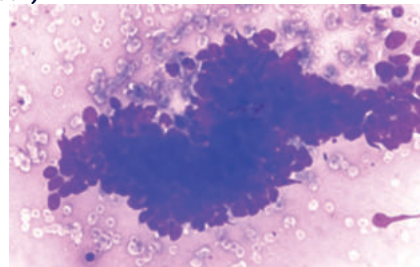


Figure: Keratinizing Squamous Cell Carcinoma MGG stain (400x)

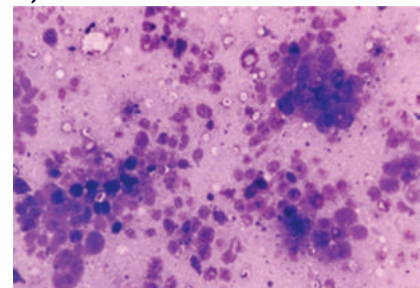


Figure: Adenocarcinoma MGG stain (400x)

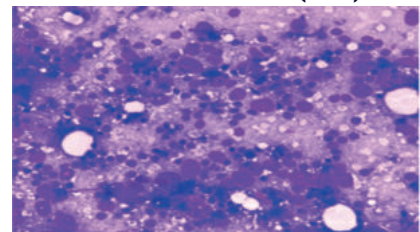


Figure: Ductal Cell Carcinoma of Breast MGG stain (400x)



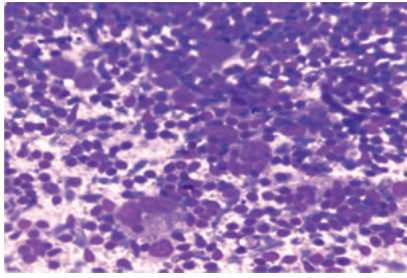


Figure: Hodgkins Lymphoma MGG stain (400x)

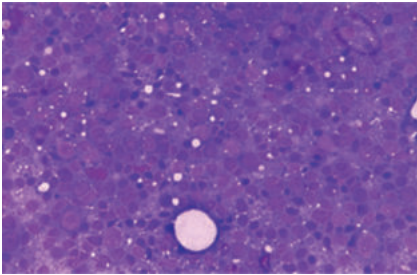


Figure: Non Hodgkins Lymphoma MGG stain (400x)

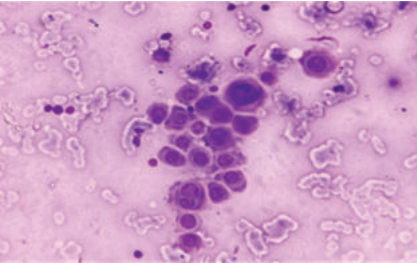


Figure: Plasmacytoma MGG stain (400x)

**DISCUSSION**

In many cases, LAP may be the first presenting sign of an underlying malignancy [4]. FNAC plays a pivotal role in making diagnosis in the superficial, easily accessible lymph nodes. It is an easy, cost-effective and rapid diagnostic procedure. The main importance of FNAC is that this simple diagnostic procedure can be easily performed in any peripheral center with minimal resources [5]. 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 diagnosed and managed on FNAC. Appropriate cases which need further evaluation can be easily identified by this procedure. This is important in advanced stage patients where exposure to anaesthesia or excision biopsy cannot be performed due to health constraints. Secondly, the procedure helps in identifying an occult malignancy which was not clinically suspected in a patient [6]. In our study, 1026 lymph nodes were aspirated during 2 year period. Similar to previous studies, majority of cases were reported as a benign pathology ( 825/1026; 80.4%) [3,7]. Previous studies report incidence of malignancies in lymph nodes varying from 5.8% to 25.03% [2,3,8]. In our audit, we recorded more cases of metastatic carcinoma (173/201; 86%) than primary lymphomas ( 28/201; 13.9%). The results are in agreement with the previous studies [10,11]. The age range was wide from 05 years to 87 years. Only 02 malignancies were identified in pediatric population.

These cases were Hodgkin's lymphoma (05 years), Squamous cell carcinoma (12 years ). Malignant lymph node aspirate identified in males (162 cases) were significantly higher than in females (39 cases). This may be attributed to higher incidence of head and neck carcinomas in males due to higher consumption of tobacco products and more smoking in male population. Similar to other studies, SCC was the most common carcinoma metastasizing to lymph nodes in our study [5, 12]. Cervical lymph nodes (140/188; 74%) were the

main group of lymph node involved by malignant pathology. This finding is also in agreement with other studies [10-12]. Adenocarcinoma was the next common metastasizing tumor. In our study we identified 20 cases of NHL and 10 cases of Hodgkin's lymphoma. NHL revealed monotonous atypical lymphoid cells population. Hodgkin's lymphoma revealed characteristic Reed Sternberg cells in a background of pleomorphic cell population comprising of mature lymphocytes, eosinophils and plasma cells. The aim of FNAC in primary lymphomas is to identify these cases which can be advised further work up. It is important to subtype the lymphomas based on WHO classification as the treatment protocols may vary in different subtypes [13,14]. This can be achieved by excision biopsy of the involved lymph node along with immunohistochemistry for proper characterization of lymphomas. So the importance of FNAC in lymphomas is to triage such cases for further work up.

**CONCLUSION**

FNAC should be considered as an effective first line investigation in making a diagnosis in superficial lymph nodes. This is important in a low resource rural setting where majority of cases can be managed by this cost effective simple investigation. It also helps to triage the appropriate malignancy cases which may be provided a rapid diagnosis and timely intervention. Further, it will be extremely useful in advanced stage patients especially in elderly age group as these cases may need only palliative care based on the FNAC diagnosis. It also proves itself as a first investigation in clinching diagnosis of an occult malignancy in many cases.

**REFERENCES**

- Hafez NH, Tahoun NS. Reliability of fine needle aspiration cytology (FNAC) as a diagnostic tool in cases of cervical lymphadenopathy. J Egypt Natl Canc Inst. 2011; 23: 105-14. <https://goo.gl/GqCWST>
- Hirachand S, Lakhey M, Akhter J, Thapa B. Evaluation of fine needle aspiration cytology of lymph nodes in Kathmandu Medical College, Teaching hospital. Kathmandu Univ Med J (KUMJ). 2009; 7: 139-42. <https://goo.gl/1DXJMd>
- Wilkinson AR, Mahore SD, Maimoon SA. FNAC in the diagnosis of lymph node malignancies: A simple and sensitive tool. Indian J Med Paediatr Oncol. 2012; 33:21-4. <https://goo.gl/HY9YA5>
- Alam K, Khan A, Siddiqui F, Jain A, Haider N, Maheshwari V. Fine needle aspiration cytology (FNAC): A handy tool for metastatic lymphadenopathy. Int J Pathol. 2010; 10: 2. <https://goo.gl/Yh4dAh>
- Khajuria R, Goswami KC, Singh K, Dubey VK. Pattern of lymphadenopathy on fine needle aspiration cytology in Jammu. JK Sci. 2006; 8: 157-9. <https://goo.gl/9gkkJE>
- Bagwan IN, Kane SV, Chinoy RF. Cytologic evaluation of the enlarged neck node: FNAC utility in metastatic neck disease. Int J Pathol. 2007; 6: 2. <https://goo.gl/is7a2t>
- Atul Shrivastav, Harsh A Shah, Neeru M Agarwal, Pravina M Santwani, Geetika Srivastava. Evaluation of peripheral lymphadenopathy by fine needle aspiration cytology: A three year study at tertiary center. J NTR Univ Health Sci. 2014; 3: 88-91. <https://goo.gl/wAUGlR>
- Sinha SK, Basu K, Bhattacharya A, Banerjee U, Banerjee D. Aspiration cytodiagnosis of metastatic lesions with special reference to primary sites. J Cytol. 2003; 20: 16-8.
- Gupta N, Rajwanshi A, Srinivasan R, Nijhawan R. Pathology of supraclavicular lymphadenopathy in Chandigarh, north India: An audit of 200 cases diagnosed by fine needle aspiration. Cytopathology. 2006; 17: 94-6. <https://goo.gl/hYIE4Z>
- Saluja JG, Ajinika MS. Comparative study of fine needle aspiration cytology, histology, and bacteriology of enlarged lymph node. Bombay Hosp J. 2000; 42: 1-7. <https://goo.gl/n4EYGO>
- Hoft S, Muhle C, Brenner W, Sprenger E, Maune S. Fine needle aspiration cytology of the sentinel lymph node in head and neck cancer. J Nucl Med. 2002; 43: 1585-90. <https://goo.gl/DPhxTQ>
- Bezabih M, Mariam DW. Determination of aetiology of superficial enlarged lymph nodes using fine needle aspiration cytology. East Afr Med J. 2003; 80: 559-63. <https://goo.gl/FkSiuU>
- Jaffer S, Zakowski M. Fine needle aspiration of axillary lymph nodes. Diagn Cytopathol. 2002; 26: 69-74. <https://goo.gl/kmeG6X>
- Anila KR, Nayak N, George PS, Jayasree K. Utility of fine needle aspiration cytology in evaluation of lymphadenopathy - An audit from a Cancer Centre in South India. Gulf J Oncolog. 2015; 1: 50-6. <https://goo.gl/aZ23bR>