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Original Research Article

Cytomorphological Pattern of Lymph Node Lesions- A Retrospective Study Conducted at District Health Centre, Gujarat

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Abstract:

Introduction: Lymphadenopathy, often known as the swelling of lymph nodes, is a common illness that is often encountered in clinical settings. FNAC has become an essential diagnostic technique for identifying the root causes of lymphadenopathies. A new category approach for the classification and reporting of lymph node cytopathology was presented at the 20th International Congress of Cytology in Sydney in May 2019, bringing about a significant transformation in the discipline.

Materials and Methods: This retrospective study was carried out at a single center over the course of two years, and it involved the review of slides from cytology and histopathology by two pathologists with extensive experience. The objective of the study was to assess the performance of the Sydney system in terms of its diagnostic accuracy and clinical utility for reporting lymph node cytopathology.

Results: The findings showed that the majority of cases (41 cases) were discovered in patients between the ages of 11 and 20. There were 127 cases of lymphadenopathy in the cervical region, which was the region with the highest number of cases. The majority of instances, which totaled 143, were deemed to be benign. It is important to note that the Sydney method has a high diagnostic accuracy, as evidenced by the fact that the study discovered a Risk of Malignancy (ROM) of 100% in categories IV and V, 50% in category III, and 3.8% in category II.

Conclusion: This study demonstrates that FNAC is a safe, cost-effective procedure for diagnosing lymph node lesions. Furthermore, the Sydney system provides an effective framework for classifying and reporting lymph node cytopathology, aiding in patient management and treatment decisions.

Keywords: Lymph node, FNAC, Sydney.

Introduction

Lymphadenopathy, the condition characterized by the swelling of lymph nodes, is frequently observed in clinical practice. Fine Needle Aspiration Cytology (FNAC) is a crucial diagnostic method for lymphadenopathies, particularly in economically disadvantaged nations like India, due to its efficiency, affordability, and little complications.

In this investigation, Fine Needle Aspiration Cytology (FNAC) was performed on all palpable deep lymph nodes, regardless of their location, patient age, or presenting symptoms. [1]

After development of these classifications for categorizing cytology of the cervical, thyroid, and salivary glands. [2,3,4] During the 20th International Congress of Cytology in Sydney in May 2019, a proposal was made to provide a novel framework for categorizing and documenting lymph node cytopathology. The Sydney system utilizes a combination of clinical and imaging data to categorize lymph node FNAC diagnosis and ascertain the optimal treatment approach. It has received support from the European Federation of Cytology Societies, the International Academy of Cytology (IAC), and the EFCS Congress in Malmo, Sweden, in 2019. [5]

The objective of the study was to employ the Sydney method for the categorization of lymph node lesions and thereafter compare these categories with histopathology results.

Materials and Methods

This detailed, retrospective study took place in the pathology lab at Shantabaa Medical College &

General Hospital, Amreli, from January 2022 to December 2023. Cases of lymph node aspirates from both sexes and all age groups were included, while non-lymph node aspirates were removed.

There were 170 cases that met the conditions for inclusion. FNAC was performed in each case with a 23-gauge needle under aseptic settings. Superficial and palpable lymph node aspirations were performed blindly, while non-palpable and deep lymph nodes were aspirated with ultrasound guidance.

Two pathologists looked at slides that had been stained with Hematoxylin and Eosin (H&E) and Papanicolaou stains. More smears were made on people who were thought to have tuberculosis and stained with Ziehl-Neelsen stain. Samples were also taken for CB-NAAT. This study got ethical approval from the institution where it was done. Cytological and pathological data that had already been reported were looked at and put into groups using the Sydney method. [5] The tests were put into five groups for diagnosis:

1. L1: Inadequate/Non-diagnostic
2. L2: Benign
3. L3: Atypical Lymphoid Cells of Uncertain Significance (ALUS) or Atypical Cells of Uncertain Significance (AUS)
4. L4: Suspicious
5. L5: Malignant

The second level of diagnosis was not met in any of the cases.

Results

A total of 170 aspirates were identified, with a male-to-female ratio of 1:1.03. The age of patients spans from 15 days to 90 years.

The majority of cases occurred in individuals aged 11 to 20, while the lowest numbers of cases were observed in individuals aged 80 to 90. Findings are given in table1.

Table 1: Age Wise Distribution

Age in Years	Total No. Of Patients (170)
0-10	25
11-20	41
21-30	39
31-40	18
41-50	14
51-60	16
61-70	11
71-80	04
80-90	02

A variety of lymph node groups were found, with the largest number located in the cervical, submandibular, submental, axillary, supraclavicular, inguinal, postauricular, preauricular, and suprasternal regions, in descending order. The cervical group had the highest number of instances, whereas the suprasternal group had the lowest number of cases. Findings depicted in table2.

Table 2 Site Wise Distribution of Lymph Node Lesions

Site	
Cervical	127
Inguinal	04
Supraclavicular	06
Axillary	07
Submandibular	12
Submental	08
Post auricular	03
Preauricular	02
Suprasternal	01

Out of 170 cases, 5 were classified as L1 (inconclusive, having only blood and mature lymphocytes). In the L2 group, there were 143 cases of granulomatous, reactive, non-specific, acute suppurative, and necrotizing lymphadenitis. Reactive lymphadenitis was the most common type. Shown in figure 1 and 2.

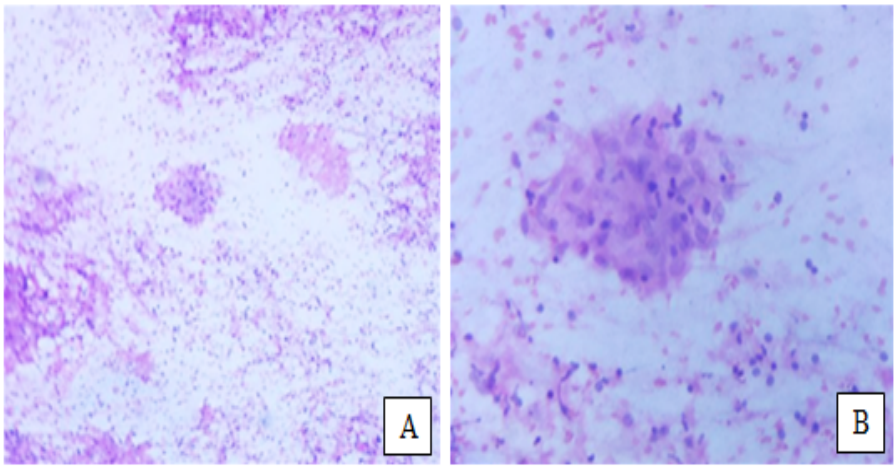

Figure 1: L2 Category: Granulomatous lymphadenitis A: Hematoxylin and Eosin (H&E): 10x; B: Hematoylin and Eosin (H&E): 40x

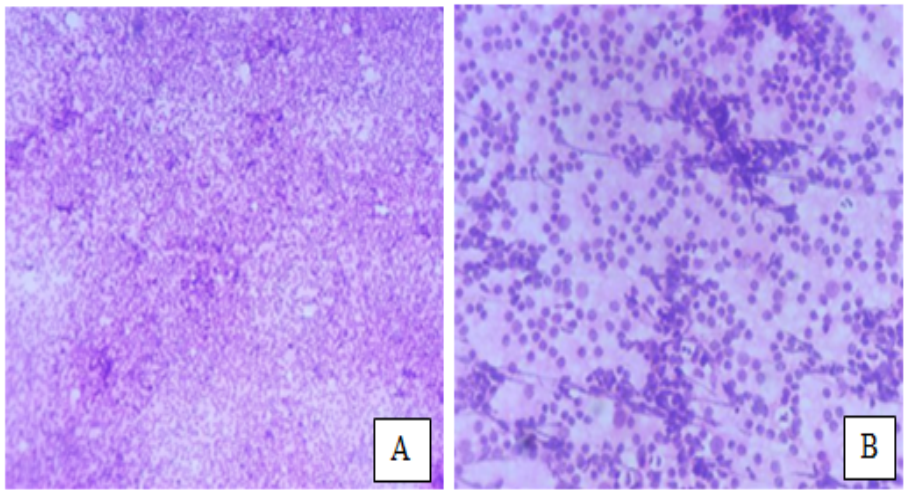

Figure 2: L2Category: Reactive lymphadenitis A: Hematoxylin and Eosin (H&E): 10x; B: Hematoylin and Eosin (H&E): 40x

Two of the cases in L3 were atypical cells, shown in figure3 and two of the cases in L4 were suspicious for lymphoma or metastasis. The L5 category includes 18 malignant cases, shown in figure 4 and 5. Given in table 3.

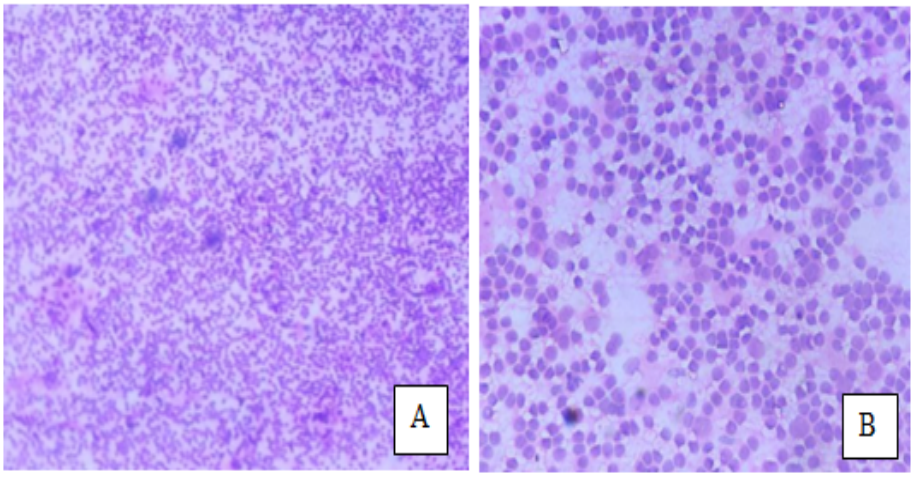

Figure 3: L3 Category: Atypical lymphocytes A: Hematoxylin and Eosin (H&E): 10x; B: Hematoylin and Eosin (H&E): 40x

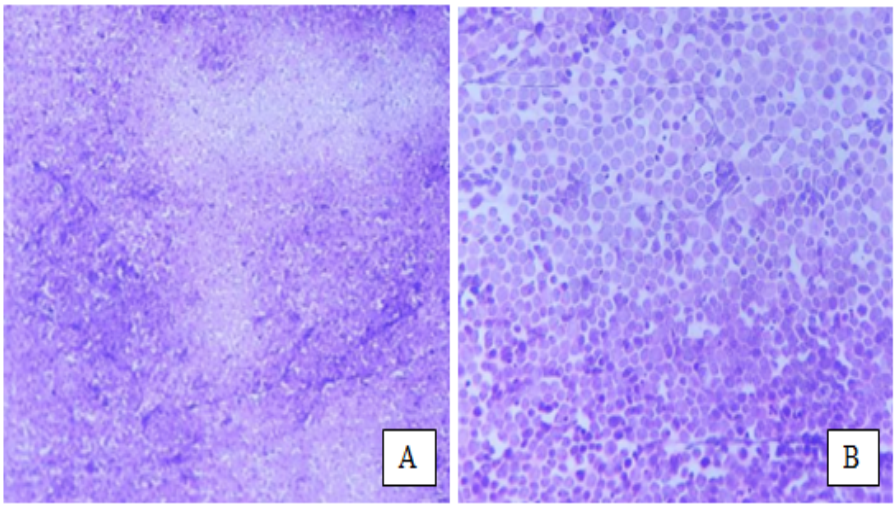

Figure 4: L5 Category: Lymphoproliferative disorder A: Hematoxylin and Eosin (H&E): 10x; B: Hematoylin and Eosin (H&E): 40x

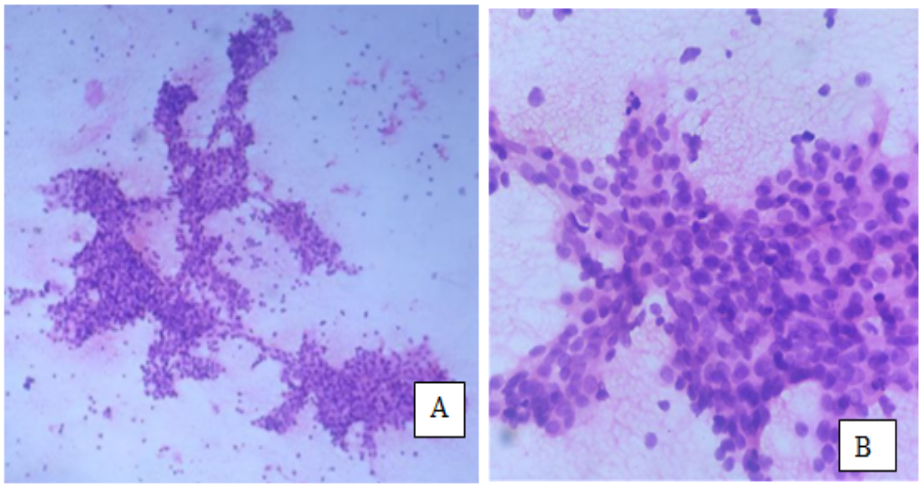

Figure 5: L5 Category: Metastasis for malignant epithelial lesion A: Hematoxylin and Eosin (H&E): 10x; B: Hematoylin and Eosin (H&E): 40x

Table 3: Sydney category wise distribution

S. No.	Category	Cytology diagnosis (n=170)
1	L1-Inconclusive (n=5)	Blood-04 Only few Mature Lymphocytes- 01
2	L2-Benign (n=143)	Granulomatous lymphadenitis-46 Reactive lymphadenitis-67 Non-specific lymphadenitis-14 Acute suppurative lymphadenitis-11 Necrotising lymphadenitis-05
3	L3-Atypia (n=2)	Atypical lymphocytes-2
4	L4- Suspicious (n=2)	Lymphomas- 1 Metastasis- 1
5	L5- Malignant (n=18)	Non-Hodgkin's lymphoma-1 Lymphoproliferative disorder-1 Metastasis-16

Histopathology follow-up was provided for several cases, allowing for the calculation of the Risk of Malignancy (ROM). There was follow-up on 26 of the 143 cases in L2, with 25 being benign and 1 being malignant. This means that the ROM was 3.8%. The ROM for L3 was 50%, with one case being normal and the other being malignant. Categories L4 and L5 had 2 and 18 cases, respectively, all of which were cancerous, resulting in a ROM of 100%. Provided in table4.

Table 4: Distribution of cases by Histopathology

Sydeny Category	Cytology cases	Histopathology follow up cases	Benign Cases	Malignant Cases	ROM
I	5	0	0	0	0
II	143	26	25	1	3.8%
III	2	2	1	1	50%
IV	2	2	0	2	100%
V	18	18	0	18	100%

Discussion:

Lymph node FNAC has been diagnostic tool since early days; however there was no reliable method for reporting. The Sydney method was made so that reporting and taking care of patients are always the same. [6, 7] This study showed that the Sydney method is a good way to diagnose lymph node lesions using FNAC.

In this study, 74.7% (n=127) of the patients had cervical lymphadenopathy, which could be either one-sided or two-sided. These results agreed with those of studies by Pandya et al., Gupta P et al., and Vigilar E et al. [5, 8, 9] You can see these results in table-5A. The highest percentage of cases in this study (74.7%) was in the L2 group, which is similar to the study by Pandya et al. [5] this could be because the sample size was small or because there were more cases of tuberculosis and other infections in the area where the study was done. On the contrary, studies by Gupta P et al., Vigilar E et al., [8, 9], showed equal distribution between normal and malignant lesion categories. The results can be seen in Table 5B.

Table 5: A. Comparison of sites of lymphadenopathy B. Distribution of cases in the present study with other studies [5, 8, and 9].

A. Site of lymphadenopathy	Present study	Pandya et al.[5]	Gupta P et al., [8]	Vigilar E et al., [9]
Cervical group	74.7%	67.5%	66.8%	45.3%
Axillary group	4.1%	12.3%	14%	18.3%
Inguinal group	2.3%	5.15%	8.1%	9.7%
Submandibular	7.0%	5.15%	2%	13.3%
Others	11.8%	9.7%	9.1%	13.4%
B. Categories	**Present study**	**Pandya et al.[5]**	**Gupta P et al., [8]**	**Vigilar E et al., [9]**
L1-Non diagnostic	2.9%	4.12%	4.1%	6.7%
L2- Benign	84.1%	61.34%	48.6%	34.7%
L3- Atypical	1.2%	3.09%	0.5%	8.3%
L4- Suspicious	1.2%	13.4%	1.4%	4.3%
L5-Malignant	10.6%	18.04%	45.5%	46%

In this study, ROM was compared to ROM from other studies. In the L1 group, ROM wasn't measured because smears only showed blood and mature lymphocytes, and there was no follow-up.

It was different from studies done by Pandya et al. (0.5% ROM) and Gupta P et al. (11.5%).[5,8] In our study, the ROM for group L2 was 3.8%, and was similar with work by Vigilar E et al. is 1.92%.[9] Findings are depicted in table6. The ROM for category L3 in this study is 50%, which is the same as what Pandya et al. found (50%) [5] and what Vigilar E et al. found (58.3%) [9], but different from what Gupta P et al. found (66.7%) [8].

The results are shown in table6. In our study ROM for category L4 and L5 was 100% which is in agreement with study done by Pandya et al., Gupta P et al., and Vigilar E et al. which is 100%, 99.6% and 88% respectively.[5,8,9] Findings are shown in table 6.

Table 6: Comparison of ROM

Sydeny Category	ROM of present study	ROM of Pandya et al.[5]	ROM of Gupta P et al., [8]	ROM of Vigilar E et al., [9]
I	0	0	27.1%	50%
II	3.8%	0.5%	11.5%	1.92%
III	50%	50%	66.7%	58.3%
IV & V	100%	100%	99.6%	88%

Conclusion

This study illustrates the diagnostic accuracy and clinical utility of the Sydney approach for identifying and reporting lymph node cytopathology. The findings show that FNAC remains a valuable, safe, and cost-effective diagnostic tool, particularly in resource-limited settings like India. The Sydney system helps to streamline reporting and patient management by offering a standardized classification framework.

The study's results are consistent with those of earlier research, validating the Sydney system's significance in diagnosing and managing lymph node lesions efficiently, contributing to uniform and comprehensive patient care.

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