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Role of Sydney system in the reporting of lymph node cytology

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Abstract

Background: Lymph node enlargement requires thorough evaluation. Fine-needle aspiration cytology (FNAC) is a primary diagnostic tool, particularly for infectious conditions and distinguishing benign from malignant lesions. To address this, the Sydney system for reporting of lymph node cytology was established to promote standardized reporting and optimal patient care.

Aims & Objectives: The present study aims to assess the applicability and accuracy of the system in the diagnosis of lymph node cytology.

Materials and Method: This study included 135 patients who presented to the Cytopathology Department at B.J. Medical College, Civil Hospital, Ahmedabad, between April 2024 and June 2024. The cytological features were evaluated and the cases were classified according to Sydney System.

Result: Total 135 cases were evaluated cytologically. The distribution of cases into different categories was as follows L1-Inadequate/Non-Diagnostic (2.96%), L2- Benign (82.22%), L3- Atypical: ALUS/AUS (5.92%), L4- suspicious for malignancy (2.96%), L5-Malignant (5.92%). The ROM for non-diagnostic, Benign, ALUS/AUS, Suspicious for malignancy, Malignant were 0%, 4.76%, 50%, 100%, and 100%, respectively.

Conclusion: The Sydney system for reporting of lymph node cytology is an essential tool for standardizing reporting and preoperatively stratifying cases. The findings of this study reinforce the value of Sydney system in enhancing diagnostic accuracy, stratifying malignancy risk, and facilitating collaborative patient management between cytopathologists and clinicians, highlighting the need for ongoing refinement and widespread adoption.

Keywords: Sydney system, lymph nodes, fine needle aspiration cytology

Introduction

Fine-needle aspiration cytology (FNAC) has emerged as the preferred initial approach for evaluating lymphadenopathy of unknown origin. Its widespread acceptance can be attributed to several advantages including Minimal invasiveness, Rapid turnaround time, Cost-effectiveness and Ability to provide material for various ancillary techniques. These benefits make FNAC an invaluable tool in the assessment of lymphadenopathy [1].

The conventional system of reporting lymph node smears lacks standardized diagnostic classification, a common language of reporting among cytopathologists and clear communication to clinicians about risk of malignancy and further management [5-6].

To address this problem, The Sydney System, proposed at the 20th International Congress of Cytology in May 2019 held in Sydney, introduces a categorical system for performance, classification, and reporting of lymph node cytopathology [3].

This system is based on well-documented international cytopathology studies, as well as years of experience of the contributing authors from all over the world. It allows for the categorization of LN-FNA diagnoses, provides a management algorithm, and has been endorsed by the International Academy of Cytology and the European Federation of Cytology Societies [2-3]. According to this system, the aspirates from lymph nodes should be categorized into 5 categories based on the specific cytologic features. The categories are as follows category I/L1: inadequate/non-diagnostic, Category II/L2: benign, category III/L3: atypical cells of undetermined significance/atypical lymphoid cells of uncertain significance, category IV/L4: suspicious for malignancy and category V/L5: malignant [3-4].

Materials and Methods

The study was carried out in the cytopathology department at B.J.medical college, Ahmedabad during the period of April 2024 and June 2024.

A total of 135 patients with Lymph node lesions who were sent to Pathology department for FNAC were aspirated and subsequently examined.

After proper history, consent was taken from the patient for the procedure, fine needle aspiration cytology was performed under strict aseptic conditions. FNAC was conducted by 10 ml disposable syringes connected with 22 to 24 bore hypodermic needles and aspirating cytological material from lesions of lymph node. The air dried cytological smears prepared from the aspirate were stained with May-Grunwald-Giemsa stain and alcohol fixed smears were stained by Haematoxylin &Eosin stain and Papanicolaou stain. Special stain such as modified Ziehl-Neelsen stain, for acid-fast bacilli (AFB) was used wherever necessary. After staining, the slides were mounted with DPX and then observed under the microscope.

The cytomorphology of lymph node aspiration were evaluated and the cases were classified according to Sydney System as follows:

L1: Inadequate/Non Diagnostic

L2: Benign

L3: Atypical Cells Of Undetermined Significance/Atypical Lymphoid Cells Of Uncertain Signifiicance (Aus/Alus)

L4: Suspicious

L5: Malignant

To validate the cytological diagnoses, we compared them with Histological reports and Clinical follow-up data (where available).

Risk of Malignancy (ROM) Calculation

For each category, we calculated the ROM by dividing the number of malignant cases confirmed by histopathology by the total number of patients with available histopathological reports.

ROM Formula

ROM (%) = (Number of malignant cases on histopathology / Total number of patients with histopathological reports) x 100

This calculation enabled us to assess the likelihood of malignancy for each cytological category."

Results

Total 135 lymph node fine needle aspiration smears were reviewed during study period. Out of which, 72(53.33%) were females and 63 (46.67%) were male. Most common site for FNA was cervical lymph nodes, comprising 79.25% (n=107) cases. Second most common site was axillary lymph nodes with 8.88% (n=12) cases, followed by submandibular lymph nodes 3.7% (n=5) cases, inguinal lymph nodes 1.48% (n=2) cases, and 6.66% (n=9) cases from other sites including submental, Preauricular, Angle of mandible lymph nodes. The most common age group undergoing lymph node FNA in the study was age 11 to 20 years group shown in table 1.

The study categorized lymph node fine needle aspiration (FNA) smears into five groups

A total of 2.96% (n=4) cases were reported as the non-diagnostic/inadequate category (L1), with one showing only necrotic material and the 3 cases containing only blood and no cellularity. The most common category was benign cytological diagnoses (L2), accounting for 82.22% (n=111) cases. Among these, tuberculosis was the most prevalent diagnosis, seen in 71 cases (63.96%). Other benign diagnoses included reactive lymphadenitis, acute lymphadenitis with abscess formation, and chronic nonspecific lymphadenitis.

Atypical Cells of Undetermined Significance/Atypical Lymphoid Cells of Uncertain Significance (Aus/Alus) (L3) included 5.92% (n=8) cases.

4 cases (2.96%) were categorized as suspicious for malignancy (L4) include suspicious of Hodgkin Lymphoma and suspicious of Non Hodgkin lymphoma.

Malignant lesions (L5) were seen in 8 cases (5.92%), include Metastatic Squamous Cell Carcinoma, Metastatic Poorly differentiated carcinoma, Metastatic Adenocarcinoma, DLBCL. metastatic squamous cell carcinoma from the oral cavity or penis and metastatic adenocarcinoma from breast.

Distribution of cases according to Sydney system given in table no.2 Histopathological (HP) correlation was available for 30 cases. In the L1 non-diagnostic category, histopathology correlation was available for 2 cases and both are diagnosed as chronic non specific lymphadenitis. The ROM for this category was 0%.

In the L2 category of benign cytology, histopathology was available for 21 cases out of which 1 showed features of malignancy (Hodgkin lymphoma). The ROM for this category was 4.76%.

In the L3 category, HP was available in two cases; one proved to be a reactive lymph node, and the other proved to be Poorly differentiated Squamous Cell Carcinoma probably metastatic origin. The ROM for this category was 50%.

Histopathological correlation was available for only one case in Category L4 (Suspicious for Malignancy), and it confirmed the presence of Hodgkin Lymphoma. The ROM for this category was 100%.

In L5, 4 cases (50%) had HP correlation. HP confirmed malignancy in all the 4 cases. Among the four metastases cases, three were metastatic squamous cell carcinomas and one metastatic adenocarcinoma. The ROM for this category was 100%.

Discussion

Aspiration cytology is a commonly used initial diagnostic tool for evaluating lymphadenopathy of unknown origin. Its advantages include rapid results, cost-effectiveness, minimal invasiveness, and versatility in assessing lymphadenopathy. Additionally, aspiration cytology provides material that can be used for various supplementary procedures [7-8]. The evaluation of lymph nodes in cytology can be challenging. Use of lymph node FNAC reporting is still not accepted uniformly by clinicians. This is brought about by absence of guidelines and standard reporting procedures. In 2020 proposal of Sydney system for lymph node was proposed to keep uniform reporting and better communication.[8] The present study categorized lymph node fine-needle aspiration cytology (FNAC) samples using the Sydney system. In the current study the age range of patient undergoing FNA was from 1year to 80 years. The current study had more number of female patients undergoing lymph node FNA.

The present study revealed that 79.25% (n=107) of patients presented with cervical lymphadenopathy, affecting both unilateral and bilateral lymph nodes and Second most

common site was axillary lymph nodes with 8.88% (n=12). Similar trends were also observed in studies conducted by Gupta P *et al*. and Vigilar E *et al*. [9-10].

In the present study, the L2 category demonstrated a higher prevalence (82.22%), which may be attributed to the relatively small sample size and/or the increased incidence of tuberculosis in the study area. In contrast, studies by Gupta P *et al*. [9] and Vigilar E *et al*. [10] reported a more balanced distribution between benign and malignant lesion categories. In Gupta P *et al*. benign and malignant lesions were 48.6% and 45.5% respectively. In Vigilar E *et al*. benign and malignant lesions were 34.7% and 46% respectively.

In the category L2, only 1 case of the benign lesion was misinterpreted as reactive lymphadenitis which on histopathological examination was diagnosed as Hodgkin Lymphoma therefore the ROM was 4.76%. This finding was comparable to the study by Rivas HE *et al*. [11], which reported a ROM of 3%. Vigilar E *et al*. [10] and Gupta P *et al*. [9] reported ROM for this category as 1.92% and 11.5% respectively.

In Category L3, the Rate of Malignancy (ROM) was found to be 50%. This result was comparable to the study by Baruah *et al*. [1], which reported a ROM of 54.5% in the L3 category. Where as in study of Gupta P *et al*. [9], total 16 cases were discordant in the category L3 and the ROM was 66.7. Similarly, the ROM for category L3 was 58.3% in a study by Vigilar E *et al*. [10]. In the category L4 and L5 the risk of malignancy was found to be 100%, similar to Vigilar E *et al*. [10] and Gupta P *et al*. [9] where the ROM was reported to be 88% for L4 and 99.6% for L5.

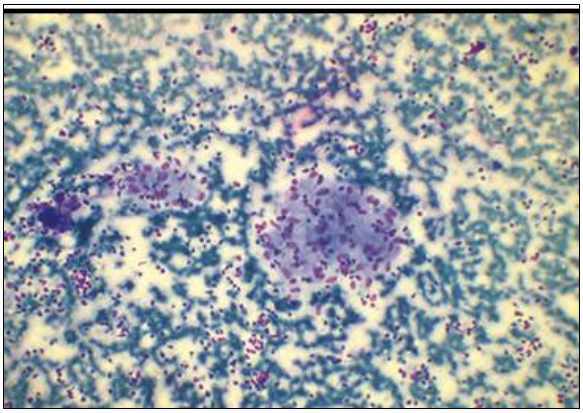

Fig 1: Smear shows Multiple epitheloid granuloma in a background of Lymphocytes (MGG 4X)

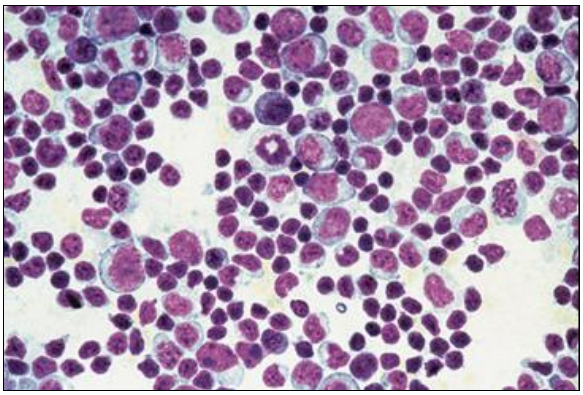

Fig 2: Smear shows Polymorphic cell populations of RLH (MGG 40X)

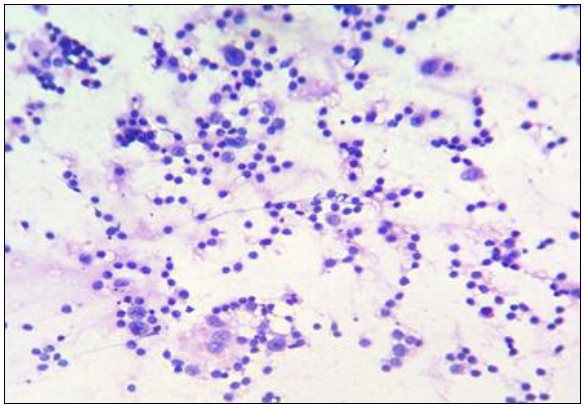

Fig 3: Smear shows Reed-sternberg cells with multilobed nuclei and prominent nucleoli on mixed inflammatory background-hodgkin lymphoma

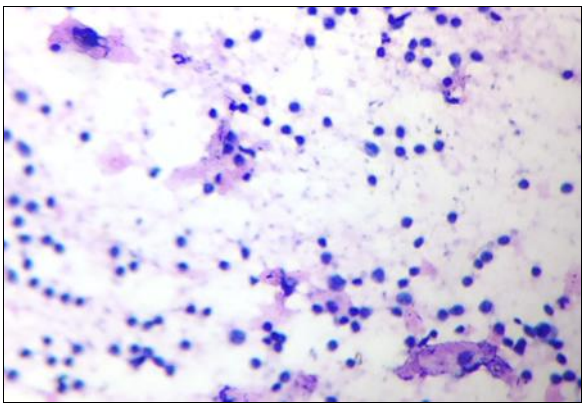

Fig 4: Smear shows Dysplastic squamous cell in background of lymphocytes.- Metastatic Squamous cell carcinoma

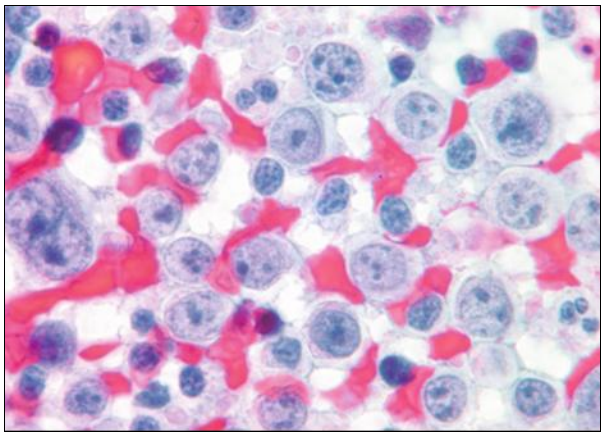

Fig 5: Smear shows Neoplastic cells with Nuclei which is two to three Times larger than small lymphocytes- Diffuse Large B Cell Lymphoma (DLBCL)

Table 1: Age Distribution of lymphnode lesions (N = 135)

Age	Number of cases	Percentage
1-10	9	6.67%
11-20	29	21.48%
21-30	32	23.7%
31-40	28	20.74%
41-50	14	10.37%
51-60	14	10.37%
>60	9	6.67%
Total	135	100%

Table 2: Distribution of cases according to Sydney system

Sr. No.	category	Cytological diagnosis (n=135)	Percentage
1.	L1: Inadequate/Non-Diagnostic (n=4)	Blood -3 Necrosis -1	2.96%
2.	L2: Benign(n=111)	Tuberculous lymphadenitis- 37 Koch's Abscess-24 Caseating Koch's lymphadenitis-10 Reactive lymphadenitis-31 Chronic nonspecific lymphadenitis-8 acute lymphadenitis with abscess formation-1	82.22%
3.	L3: Atypical Cells of Undetermined Significance/Atypical Lymphoid Cells of Uncertain Signifiicance (Aus/Alus) (n=8)	Atypical: alus/aus-8	5.92%
4.	L4: Suspicious(n=4)	Suspicious of Hodgkin Lymphoma-3 Suspicious of Non-Hodgkin lymphoma-1	2.96%
5.	L5: Malignant(n=8)	Metastatic Squamous Cell Carcinoma-3 Metastatic Poorly differentiated carcinoma-2 Metastatic Adenocarcinoma-2 DLBCL-1	5.92%

Conclusion

FNAC, as a minimally invasive technique, plays a pivotal role in evaluating lymph node swellings, offering reliable and accurate results. The present study highlights the utility of the Sydney system in the evaluation of lymph node lesions. It can help in achieving uniformity and reproducibility of cyto-pathological diagnosis. It will lead to a fairly accurate risk assessment of malignancy for further clinical management.

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Conflicts of Interests: The authors declare that they have no conflict of interest

References

1. Baruah AK, Bhuyan G. Utility of the Sydney system for reporting of lymph node cytology in a tertiary health care setup of north-eastern India. WCRJ. 2022;9:e2459. DOI: 10.32113/wcrj_202212_2459.
2. Pandya D, Bhetariya B, Gupta P. Diagnostic utility of proposed Sydney system of lymph node by fine needle aspiration cytology: A cross-sectional study. J Clin Diagn Res. 2022;16(12):EC38-EC41. Available from: https://www.doi.org/10.7860/JCDR/2022/57693/17355
3. Al-Abbadi MA, Barroca H, Bode-Lesniewska B, *et al*. A proposal for the performance, classification, and reporting of lymph node fine-needle aspiration cytopathology: The Sydney system. Acta Cytol. 2020;64(4):306-22. DOI: 10.1159/000506497.
4. Zeppa P, Cozzolino I, Caraway NP, Al-Abbadi MA, Barroca H, Bode-Lesniewska B, *et al*. Announcement: the international system for reporting lymph node cytopathology. Acta Cytol. 2020;64:299-305.
5. Hehn S, Grogan T, Miller T. Utility of fine-needle aspiration as a diagnostic technique in lymphoma. J Clin Oncol. 2004;22:3046-3052.
6. Katz R. Modern approach to lymphoma diagnosis by fine-needle aspiration. Cancer. 2005;105:429-431.
7. Wilkinson A, Mahore S, Maimoon S. FNAC in the diagnosis of lymph node malignancies: A simple and sensitive tool. Indian J Med Paediatr Oncol. 2012;33(1):21-24.
8. Zeppa P. Haematocytopathology: why? Cytopathology. 2012;23:73-75.
9. Gupta P, Gupta N, Kumar P, *et al*. Assessment of risk of malignancy by application of the proposed Sydney system for classification and reporting lymph node cytopathology. Cancer Cytopathol. 2021;129(9):701-718. DOI: 10.1002/cncy.22432.
10. Vigliar E, Acanfora G, Iaccarino A, Mascolo M, Russo D, Scalia G, *et al*. A novel approach to classification and reporting of lymph node fine-needle cytology: Application of the proposed Sydney system. Diagnostics. 2021;11(8):1314.
11. Rivas HE, Zarra KV, Pabón LA, Gutierréz MD, Ortiz NZ, Fernández MD, *et al*. Ultrasound-guided fine-needle aspiration of superficial lymphadenopathy performed by interventional pathologists: The applicability of the Sydney system from 2 years of experience and 363 cases. Acta Cytol. 2020;64(4):306-22.

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