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ORIGINAL RESEARCH OPEN ACCESS

Spectrum of lymph node lesions as per recent Sydney system of lymph node classification

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Abstract

Background: Lymphadenopathy may be an incidental finding and/or primary or secondary manifestation of underlying diseases which may be neoplastic or non-neoplastic. The aim of the current study was to evaluate the spectrum of lymph node lesions according to the Sydney system in our setting and to assess the risk of malignancy in each category.

Methods: The present study was carried out in the Department of Pathology, Nalanda Medical College and Hospital, Patna (Bihar) retrospectively during a one-year period from November 2020 to October 2021. 332 FNACs were performed on patients and the ROM (Risk of Malignancy) was assessed for each diagnostic category.

Result: In the present study, 11 cases were categorized as L1, inadequate/non-diagnostic; 291 cases as L2,benign; 06 cases as L3, AUS/ALUS; 03 as L4, Suspicious for malignancy, and finally 21 cases were categorized as L5, Malignant. The ROM was 1.28% in L2, 50% in L3, and 100% in L4,L5. ROM for L1 category could not be assessed.

Conclusion: The universal implementation of the Sydney system of reporting lymph node cytopathology can improve the diagnostic accuracy which will not only instill confidence in the pathologists but also help the clinicians to adopt better management strategies.

Keywords: granulomatous; lymphadenitis; lymphoma; metastases; malignancy

Introduction

Lymphadenopathy may be an incidental finding and/or primary or secondary manifestation of underlying diseases which may be neoplastic or non-neoplastic. The knowledge of the pattern of lymphadenopathy in a given geographical region is essential for making a confident diagnosis or suspecting a disease. Though lymph node FNACs may be quite challenging, a detailed history, physical examination coupled with radiological findings if available help the cytopathologists in proper categorization of lesions for better communication to the clinicians for effective management [1].

The aim of the current study was to evaluate the spectrum of lymph node lesions according to the Sydney system in our setting and to assess the risk of malignancy in each category.

Material and methods

The present study was carried out in the Department of Pathology, Nalanda Medical College, Patna (Bihar) retrospectively during a one-year period from November 2020 to October 2021 after approval from ethical committee.

All the FNACs were performed percutaneously using a 22-gauge needle under aseptic precautions after taking informed consent from the patients. In cases of scanty aspirate, a minimum of 2 passes were attempted.

Inclusion criteria: All the cases of lymph node aspirates from both sexes and all age groups were included.

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Exclusion criteria: Non-lymph node aspirates were excluded from the study.

A minimum of 2 air-dried smears and alcohol-fixed smears each were prepared for every case and stained with MGG and Pap stain respectively as part of the routine procedure. The smears were classified according to the proposed classification system. The corresponding histopathological correlation were done wherever available. The ROM (Risk of Malignancy) was assessed for each diagnostic category.

Results

332 FNACs were performed from patients of all ages ranging from 2 months to 76 years. The original diagnoses were reviewed and each case was classified according to the first diagnostic level of Sydney classification. In the present study, 11 cases were categorized as L1, inadequate/non-diagnostic; 291 cases as L2,benign; 06 cases as L3, AUS/ALUS; 03 as L4, suspicious for malignancy, and finally 21 cases were categorized as L5, malignant. The ROM (Risk of Malignancy) was assessed for each diagnostic category (Table 1).

In the present study, total 3.31% cases were reported as Non-diagnostic/Inadequate, L1 Category. Most of the cases had no lymphoid cells with extensive haemorrhage. This made interpretation difficult.

87.65% cases were reported as benign, L2 category out of which most of the reactive lymphadenitis cases were lost to follow-up. ZN staining for AFB and CB NAAT testing was done to confirm 47 cases of tubercular and 21 cases of granulomatous lesions. Out of the 10 cases reported as necrotizing lymphadenitis, 05 cases were CB NAAT positive for tuberculosis, 04 cases were culture positive for bacterial infection and 01 case underwent biopsy to be confirmed as non-Hodgkin lymphoma.

L3: 1.81% cases (06 cases) were reported as atypical lymphoid hyperplasia. On follow-up 02 cases did not turn-up for biopsy, 02 cases were reported as benign reactive hyperplasia and 02 cases were reported as Non-Hodgkin lymphoma on histopathology.

One of the cases reported as atypical lymphoid hyperplasia on fine needle aspiration cytology (Figure 1a) was a 47 year old male patient presenting with an enlarged cervical lymph node and prolonged weakness. On histopathological examination features were consistent with non-Hodgkin lymphoma (Figure 1b) and confirmed on immunohistochemistry with CD19 (Figure 1c) and CD20 (Figure 1d).

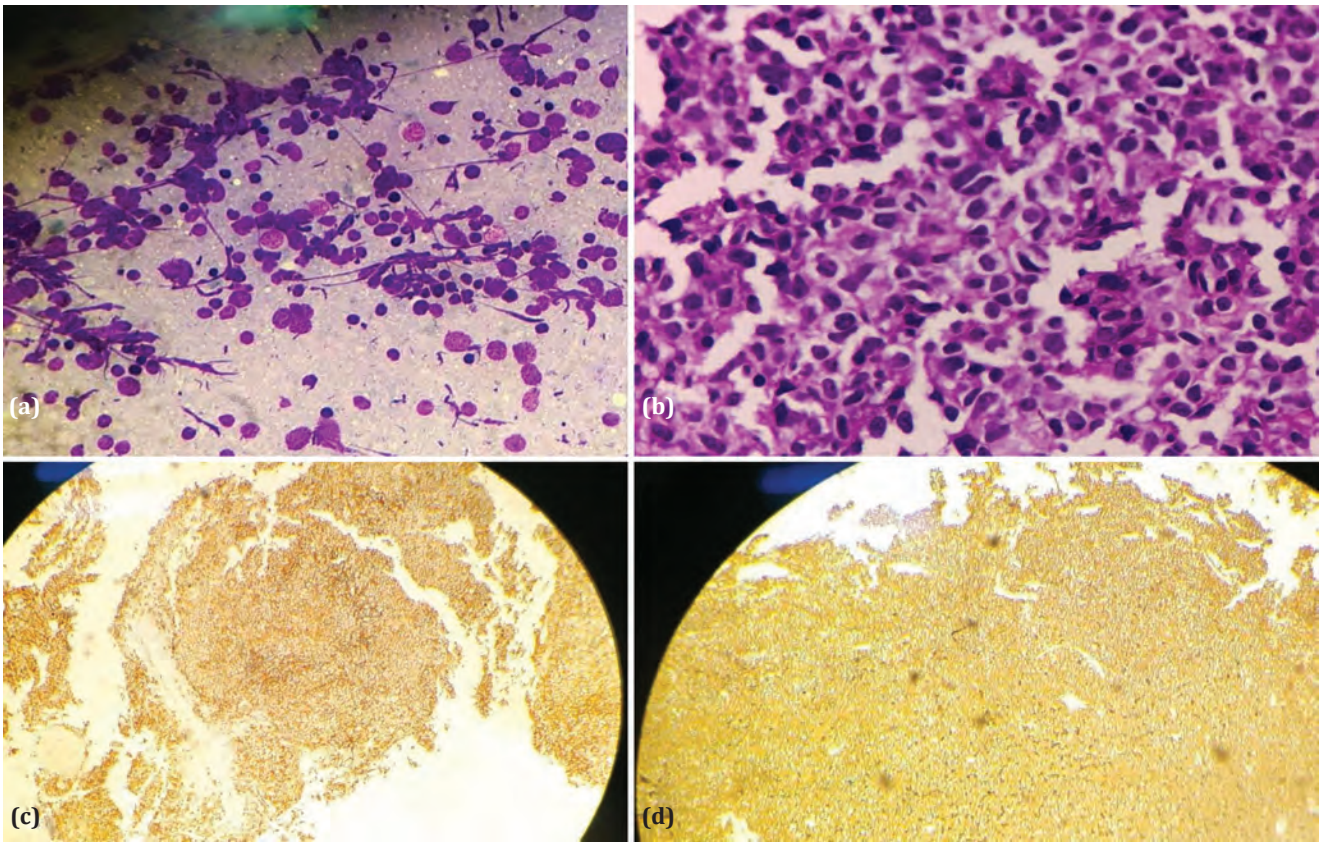

Figure 1: Smear from a case of Non-Hodgkin Lymphoma reported as Atypical lymphoid hyperplasia on FNAC. (a) Fine needle aspiration cytology showing a moderately cellular smear with large atypical cells in a background of lymphocytes (MGG stain, x40). (b) Histopathology of cervical lymph node showing effacement of lymph node architecture by monotonous population of small to medium lymphoid cells, slightly irregular with scant cytoplasm and inconspicuous nucleoli (H&E, x40). (c) Immunohistochemistry with CD19 (x10). (d) Immunohistochemistry with CD20 (x10). MGG, May-Grunwald-Giemsa; H&E, hematoxylin and eosin.

L4: 0.90% cases (3 cases) were reported as suspicious for malignancy. On biopsy, 02 cases were reported as non-Hodgkin lymphoma and 01 case as poorly differentiated carcinoma.

L5: 6.33% cases (21 cases) were reported as malignant lesion. On biopsy, these were confirmed as 03 cases of non-Hodgkin lymphoma, 04 cases of Hodgkin lymphoma, 06 cases of metastatic squamous cell carcinoma, 01 case of metastatic adenocarcinoma and 06 cases of metastatic infiltrating duct carcinoma of breast.

One case of axillary lymph node swelling in a 57 year-old female showed sheets of malignant duct epithelial cells in a background of sparse lymphoid cells on fine needle aspiration cytology. On histopathological examination this was confirmed as metastatic duct carcinoma from the breast (Figure 2).

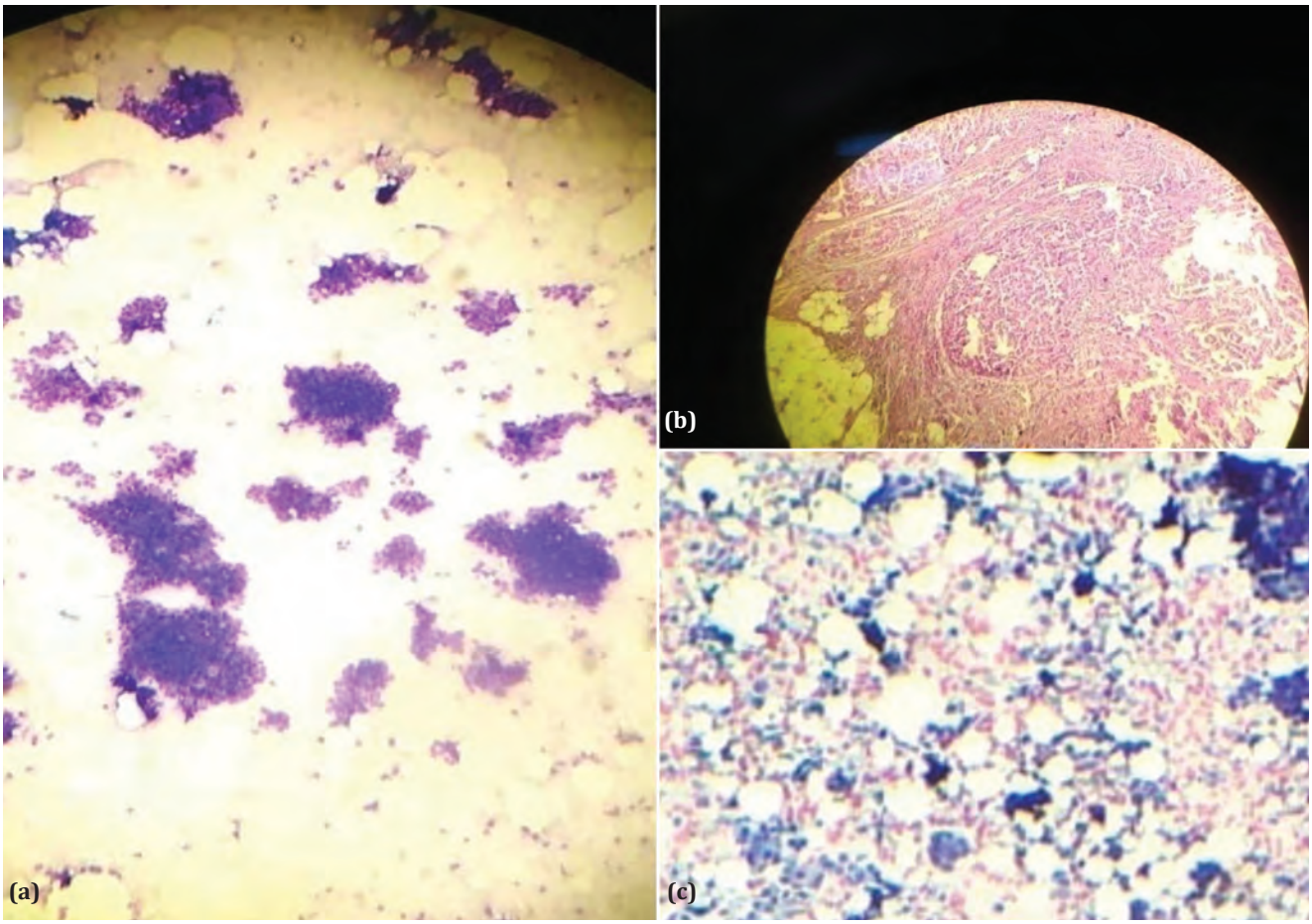

Figure 2: Smear from a case of Metastatic duct carcinoma from the breast. Fine needle aspiration cytology showing sheets of malignant duct epithelial cells in a background of sparse lymphoid cells (a. MGG stain, x10; c. Pap stain, x10). Histopathology of the axillary lymph node showed infiltration by sheets of malignant duct epithelial cells from the breast. (b. H&E, x4). MGG, May-Grunwald-Giemsa; Pap, Papanicolaou; H&E, hematoxylin and eosin.

A 65 year old male patient presenting with an enlarged supraclavicular lymph node showed dispersed malignant cells on fine needle aspiration cytology and was reported as metastatic squamous cell carcinoma (Figure 3a). On histopathological examination (Figure 3b) this was found to be consistent with Metastatic melanoma which was further confirmed on immunohistochemistry (Figure 3c) with HMB 45.

01 case reported as Metastatic adenocarcinoma on cytology did not turn-up for biopsy.

Histopathological correlation was obtained in 26 cases only. 01 case of necrotizing lymphadenitis (L2) was confirmed as non-Hodgkin lymphoma (NHL). 02 cases reported as atypical lymphoid hyperplasia were further confirmed on histopathology as NHL. 02 cases of L4 category were confirmed on histopathology as NHL and 01 case as poorly differentiated carcinoma. All except one of the 21 cases reported to be malignant (L5) were confirmed on histopathological examination (Table 2).

Discussion

Patients presenting with palpable lymph nodes are now subjected to routine FNAC as a first line investigation as this technique is rapid, repeatable, minimally invasive, accessible and cost-effective with diagnostic accuracy of about 90-99 %. It provides the clinician with a quick

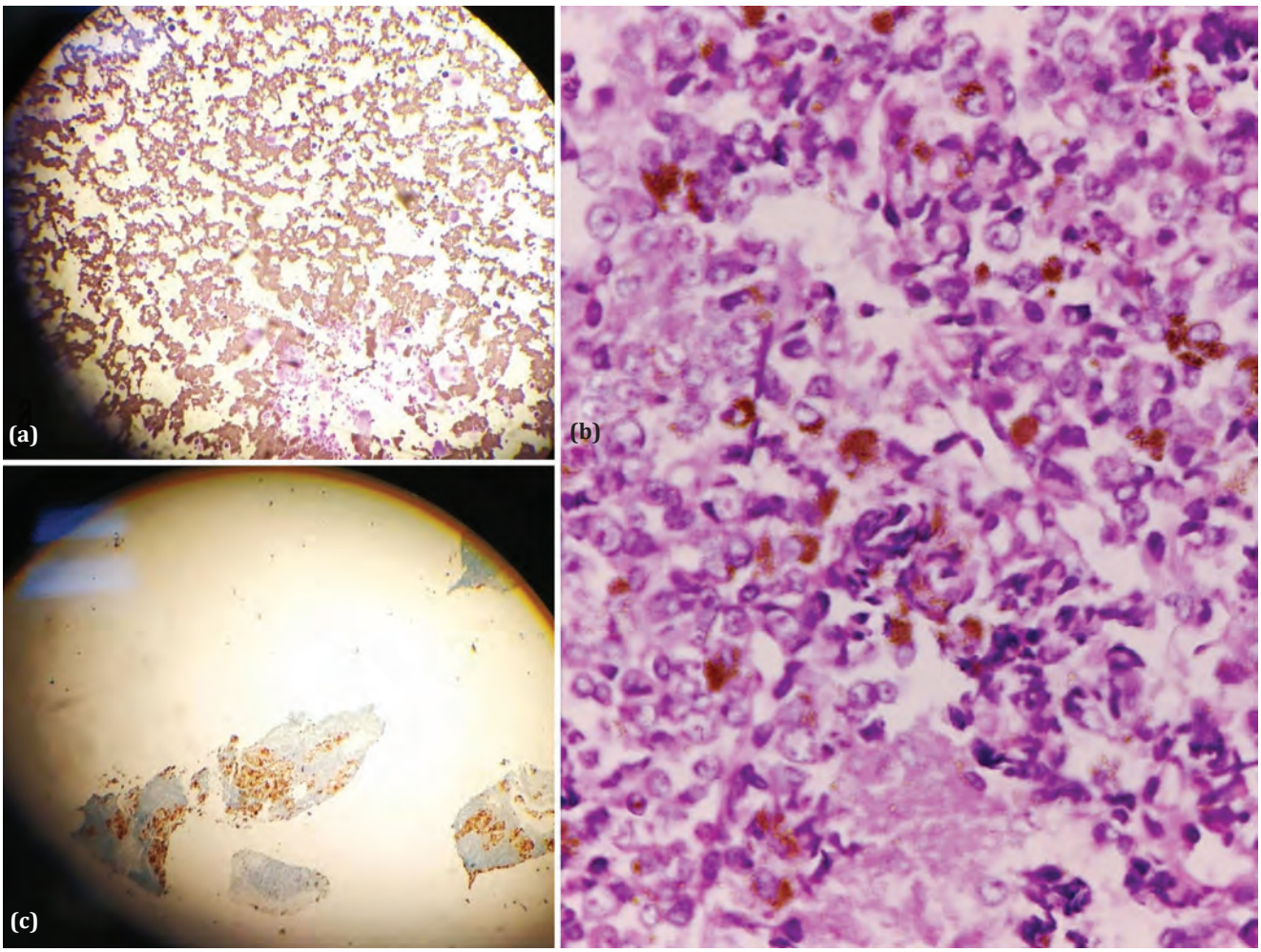

Figure 3: Smear from a case of metastatic melanoma. (a) Fine needle aspiration cytology showing dispersed malignant cells was reported as metastatic squamous cell carcinoma (MGG stain, x10). (b) Histopathology of the supraclavicular lymph node showed infiltration by epithelioid tumor cells characterized by vesicular pleomorphic nuclei and prominent nucleoli with melanin pigment deposition, (H&E, x40). (c) Immunohistochemistry with HMB45. (x4). MGG, May-Grunwald-Giemsa; H&E, hematoxylin and eosin.

Table 1: Stratification of risk of malignancy in Sydney system.

Sydney system diagnostic category	*Histological or clinical follow-up*	*Confirmed malignant lesion*	*Risk of malignancy (ROM)*
L1 (n=11)	0	0	NA
L2 (n=291)	78	01	1.28%
L3 (n=6)	04	02	50%
L4 (n=3)	03	03	100%
L5 (n=21)	20	20	100%

correlation clinically especially in limited resource settings of developing countries. However, non-uniformity and inter-observer variability in reporting have made clinicians wary of relying solely on FNAC. The recently proposed Sydney system of classification and reporting lymph node cytopathology has provided a standardized reporting system. In the present study, an attempt has been made to apply this system for evaluation of the spectrum of lymph node lesions in our setting and to assess the ROM for each category.

In the L1 category, all the FNACs performed yielded scant material despite two passes. The average size of the lymph nodes in most cases were small. All the patients were lost to follow-up and hence risk of malignancy could not be assessed. Gupta et al showed ROM to be 27.5% whereas Vigliar et al showed 50% ROM in this category [2, 3]. Repeat aspiration also yielded scant material and was thus non-diagnostic. The use of advanced techniques such as liquid-based cytology in such scenarios improve the diagnostic accuracy. The Sydney system management recommendations of performing ROSE (rapid on-site evaluation) by an experienced cytopathologist should be considered to definitely exclude the possibility of any malignancy [4].

The L2 category showed the least ROM (1.28%). This was in line with our expectation. Similar results were shown by Gupta et al (1.4%) and Vigliar E et al (1.92%).The extremely low value of ROM was most

Table 2: Categorization of spectrum of cases according to Sydney system.

Category	*Cases (Total 332) No.%*	*FNAC finding*	*Biopsy/ IHC/ ancillary tests (AFB,CB NATT)*
L1 (inadequate/ non diagnostic)	11 (3.31)	Haemorrhagic and Paucicellular	--
L2 (benign)	291 (87.65)	Reactive (213) Granulomatous (21) Tubercular (47) Necrotising (10)	-- } All TB 5 TB, 1 NHL
L3 (ALUS)	06 (1.81)	Atypical lymphoid hyperplasia	2 NHL, 2 RLH, 2 lost
L4 (suspicious of malignancy)	03 (0.90)	Suspicious of lymphoma/ poorly differentiated carcinoma	2 NHL, 1 poorly differentiated carcinoma
L5 (malignant)	21 (6.33)	Lymphoma (7) Metastatic SCC (6) Metastatic adenocarcinoma (2) Metastatic carcinoma (6)	3 NHL, 4 HL 5 metastatic SCC, 1 metastatic melanoma 1 Metastatic adenocarcinoma,1 lost 6 Metastatic ductal carcinoma

likely due to the small number of histological controls available. However the utility of FNAC as a non-invasive procedure in limited resource settings as ours cannot be undermined [2, 3].

The ROM in the L3 category came out to be 50%.This heterogeneous group showed an intermediate ROM representing an "indeterminate" category, quite similar to reporting systems for other lesions. In our study, out of the 6 cases reported under this category, 2 cases were lost in follow-up and 2 cases were reported as non-Hodgkin lymphoma on histopathology (Figure 1). Here diagnosis was done based on the presence of large cells with high nucleo-cytoplasmic ratio, enlarged and irregular nuclei, prominent nucleoli and scant cytoplasm. However the management in this category require excisional biopsy based on clinical suspicion for proper evaluation [5].

Both L4 and L5 category showed 100% ROM which was similar to studies [2, 3]. This 100% ROM in L4 may be due to the few histopathological correlation available. In our study, the second diagnostic level was mostly provided for L4 and L5. Few studies that have compared the diagnostic utility of FNAC and core-needle biopsies in the diagnosis of malignancies, especially lymphoma have found that the overall rate of diagnosis and subclassification of lymphoma is lower for the FNAC group alone and improves significantly when both FNAC and biopsy are used together [6].

Though interobserver variability was noted in category L3 and L4, no statistical analysis was done for the same. Histopathological correlation and IHC was done to arrive at a final diagnosis. No discrepancy was observed in the classification of cases into categories L1, L2 and L5.

Conclusion

The universal implementation of the recently proposed Sydney system of reporting lymph node cytology can improve the diagnostic accuracy by standardizing the categorization. However our study had limitations since it had a small sample size and was retrospective in nature. To confirm the usefulness of this system, multicentric studies with a large sample size are warranted.

Conflicts of interest

Authors declare no conflicts of interest.

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