ORIGINAL RESEARCH

Categorization of Lymph Node FNAC by Sydney System and its Utility

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ABSTRACT
Introduction: The evaluation of lymphnodes (LN) by fine needle aspiration cytology (FNAC) is routinely used as an initial diagnostic tool. To categorize LN FNAC reporting into diagnostic classes as in proposed Sydney system LN-FNAC was performed on 255 patients whose request typically originated from Physicians/Pediatricians, ENT /General Surgeons in the past one year. **Aims and Objectives:** To categorised LN FNAC reporting into diagnostic classes as per proposed Sydney system. **Materials and methods:** This is retrospective study conducted over 1year in depapartment of pathology,GMC akola on 255 patients (o to 90 years)referred by clinicians in hospital. Detailed history and examination was done. All palpable nodes were aspirated and smears were reported and classified into 5 different diagnostic categories based on the proposed Sydney system of reporting and includes of L1-inadequate/non diagnostic, L2-benign,L3-atypical cells of undetermined significance/atypical lymphoid cells of uncertain significance (AUS/ALUS), L4- suspicious,L5-malignant. **Results:** total 255 Patients age ranged from 0 years to 90 years. Mean age group was 21-30 years with more female preponderance. Of the 255 patients 151 were females and 104 were males. Majority (168) had cervical lymphnode enlargement, (21) had axillary ,(12) had inguinal,(24) had submandibular,(10)had supraauricular lymphnode enlargement and other . Of the 255 cases 126 were suspected to be of tubercular etiology of whom 115 were granulomatous with /without necrosis and 11 suppurative lymphadenitis. 100 were reactive lymphadenitis . 25cases were of malignancy.Further cases were categorised into(L1) inadequate (4), (L2)benign (226), (L3)AUS/ALUS(00), (L4)suspicious (1) and (L5)malignant (24)according to proposed Sydney system. **Conclusion:** Sydney system helps to speeds up the reporting and helps to maintain uniformity in the reporting format and to follow treatment guidelines for patients.
Key words: FNAC, Lymph node

INTRODUCTION

The evaluation of lymph nodes (LN) by fine needle aspiration cytology (FNAC) is routinely used in many institutions but it is not uniformly accepted mainly because of the lack of guidelines and a cytopathological diagnostic classification[1] .Fine-needle aspiration cytology (FNAC) of the lymph nodes is a safe, quick, cost-effective, reliable, and minimally invasive tool in the first-line evaluation of lymphadenopathy of unknown etiology[2] . Most lymph node lesions are non neoplastic, the smaller subset of neoplastic lesions need to be identified for optimal management[3,4]. The diagnosis of metastatic malignancy in lymph node cytological smear is highly reliable[5]. After the successful establishment of Bethesda system for cervical and thyroid cytology and Milan system for salivary gland cytology, in 2020 proposal of Sydney system for lymph node was proposed to keep uniform reporting and better communication[6]. According to this system, the cytologic aspirates from lymph nodes should be categorised into 5 categories based on the specific cytologic features. The cytology report should provide one of the five first-level diagnostic categories followed by a clear description of cytomorphology[7].

Objective

- To categorised LN FNAC reporting into diagnostic classes as per proposed Sydney system.

MATERIALS AND METHODS

The study was conducted in department of pathology,govt medical college,Akola.It was retrospective study conducted over period of 1 year from Dec 2023 to Nov 2024.LN-FNAC was performed on 255 patients of age 0 to 90 years in the past one year. Clinicodemographic details of these patients including Age,sex,nature and site of lymphadenopathy and sonographic finding were

collected from cytopathology lab of hospital. All palpable nodes were aspirated and smears stained with Giemsa,Hematoxylin and eosin, Papanicolaou, Ziehl-Neelsen and material was sent to district hospital for CBNAAT in suspected cases. The smears were reported and classified into 5 different diagnostic categories based on the proposed Sydney system of reporting and includes 0f

- L1-inadequate/non diagnostic
- L2-benign
- L3-atypical cells of undetermined significance/atypical lymphoid cells of uncertain
- significance (AUS/ALUS)
- L4- suspicious
- L5-malignant.

RESULT
Patients age ranged from 0 years to 90 years(Table no.1). Mean age group was 21-30 years with more female preponderance. Of the 255 patients 151 were females and 104 were males. Majority had (168)

cervical lymphnode enlargement, (21) had axillary ,(12) had inguinal,(24) had submandibular,(10)had supraauricular lymphnode enlargement and other (Table 2). Hundred cases had reactive lymphadenitis and 4 cases were inadequate. 126 were suspected to be of tubercular etiology of whom 115 had granulomatous lymphadenitis with or without necrosis and 11 case of suppurative lymphadenitis . 8 was CBNAAT positive of the 72 cases tested. No AFB was positive. Of the 24 metastatic lymphnode cases, one had deposit from Acute lymphoblastic leukemia,20 had metastatic deposits from squamous cell carcinoma and 3 from ductal carcinoma. One case was suspicious for malignacy. as shown in(Table no.3). In the present series, n = 4/255 (1.6%) were re-categorized as L1, inadequate/non diagnostic; n = 226/255(88.6%) as L2, benign; n = 00/255(00%) as L3, AUS/ALUS; n =1/255(0.4%) as L4, suspicious. Finally, the majority of cases were categorized as L5, malignant (n =24/255(9.4%) (Table no.4)

Table No. 1 Distribution of Patients according to age and gender.

Sr. No.	Age (In Years)	Male	Female	Frequency
1	0 to 10	20	9	29
2	11to 20	17	30	47
3	21 to 30	12	43	55
4	31 to 40	15	40	55
5	41 to 50	18	12	30
6	51 to 60	12	08	20
7	61 to 90	10	9	19
total		104	151	255

Table No. 2 Distribution of Patients according to Lymph node FNAC site and gender.

Sr. No	Lymph Node Site	Male	Female	Total
1)	Cervical	72	96	168
2)	Inguinal	09	03	12
3)	Axillary	07	14	21
4)	Infra Auricular	00	02	02
5)	Pre and Post Auricular	03	05	08
6)	Supraclavicular	02	08	10
7)	Submandibular	07	17	24
8)	Submental	01	03	04
9)	Suboccipital	02	03	05
10)	Peri Umbilical	01	00	01
Total		104	151	255

Table No. 3: Distribution of Patients according to Cytopathological Diagnosis of Lymph Node FNAC

Sr. No.	Cytopathological Diagnosis	No. of Patients
1)	No Opinion Possible / No Cellularity	04
2)	Reactive Lymphadenitis	100
3)	Acute Abscess	11
4)	Cold Abscess	45
5)	Granulomatous T.B. Lymphadenitis	70
6)	Suspecious of Malignancy	01
7)	Malignancy	24

Table No. 4: Distribution of Cytopathological Diagnosis according to Proposed Sydney System.

Sr. No	Level	Male	Female	Total(n)	Percentage
1)	Level 1	2	2	4	1.6
2)	Level 2	89	137	226	88.6
3)	Level 3	00	00	00	0
4)	Level 4	00	01	01	0.4
5)	Level 5	13	11	24	9.4
Total		104	151	255	100 %

Level 1 = No Diagnostic ; Level 2 = Benign ; Level 3 = ALUS or AUS ; Level 4 = Suspicious ; Level 5 = Malignant.

Benign: Benign cytologic diagnoses were rendered in 226 cases and included reactive lymphadenitis, suppurative lymphadenitis, granulomatous lymphadenitis with or without necrosis. Reactive Lymphadenitis: Reactive lymphadenitis was diagnosed in 100 cases. Ultrasound report of these patients revealed discrete oval shaped enlarged lymphnode with preserved central fatty hilum. Microscopic examination showed polymorphous population of lymphoid cells. Granulomatous Lymphadenitis: 115 cases of Granulomatous lymphadenitis with or without necrosis was diagnosed of whom 45 had caseous necrosis and granulomas but 70 had only granulomas. All cases were stained for AFB but not single case was positive for acid fast bacilli. CBNAAT was sent for 72 cases of which 18 were positive of the 115 cases. Suppurative Lymphadenitis: Suppurative lymphadenitis was diagnosed in 11 cases. 2 male patients were below 10 years and had cervical lymphnode enlargement and 6 females and 3 male of(20 to 50)years of age group had submandibular,cervical,axillary lymphnode enlargement. Smears studied from all patients showed numerous neutrophils, negative for AFB and suspected cause was bacterial infection, antibiotics were suggested.

Suspicious: 60 year female patient had left submandibular lymphnode enlargement. Smears showed atypical epithelial cells in cluster and dissociated cells. Complete blood count was within normal limit. Repeat FNAC/ excision biopsy was advised for further management. Malignant: Malignancy was diagnosed in 24 cases. 17 were male and 7 female patients and some male patients had history of smoking and tobacco chewing.one had metastasis of acute lymphoblastic leukemia. Remaining 23 had metastatic deposits from squamous cell carcinoma. Smears from these patients showed malignant epithelial cells in clusters with moderate to severe nuclear pleomorphism. For these patients chest X- ray, ultrasound neck and abdomen and evaluation of upper aerodigestive tract was suggested. It has been seen that the application of standardised reporting systems in cytopathology reduces intra-observer variability in reporting and helps in the communication of clinically relevant information in a reproducible manner. Moreover, it enhances the interpretation of cytopathological reports by clinicians with regard to risk assessment. The Sydney system for fine needle aspiration biopsy of lymph nodes has five categories, stressing the role of correlation of cytopathology with clinical, ultrasound and ancillary findings to achieve diagnosis. The five categories constitute a hierarchical system with increasing risk of malignancy from benign to atypical, suspicious, and malignant categories, which informs recommendations for further workup to achieve a final diagnosis as possible. The aim of this reporting system is to provide clearly described terminology and defined categories, key diagnostic cytopathological criteria, and best practice recommendations for the use of ancillary testing[8].
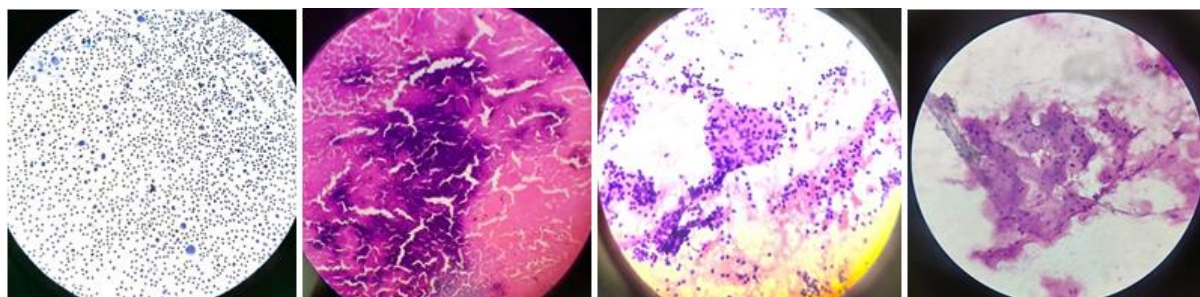

Figure: a. Reactive Lymphadenitis b. Cold abscess (TB lymph adenitis) c. Granulomatous lymphadenitis d. Metastasis of epithelial malignancy

DISCUSSION

In the present study most commonly aspirated lymphnodes were cervical followed by submandibular, axillary, inguinal, supraclavicular similar observation was made in study conducted by Rashmi et al(10),Gupta et al (9)and Pandya(6). Out of the 255 aspirates obtained, there were 104 (40.80%) males and 151 (59.20%) females, with an overall male

to female ratio of 1:1.45. Number of females outnumbered males in the age group of 21 to 30 years and in 31-40 years similar observation was made in the study conducted by Rashmi et al (10) and Qadri(11). In the present study of the 226(88.6%) benign cases , there was reactive lymphadenitis in 100 (39.2%), granulomatous lymphadenitis in 115 (45.09%) and suppurative lymphadenitis 11 (4.3%) cases. similar observation was made in the study conducted by Pandya(6) . On the contrary study conducted by Rashmi et al (10),Sreelekshmi(7), Qadri (11) showed less prevalence of tubercular lymphadenitis which could be due to decrease prevalence of tuberculosis in the area where they have conducted study. In the present study of the 115 cases of granulomatous lymphadenitis with or without necrosis no case was AFB positive but in a study conducted by Sreelekshmi[8] where only 9 cases were positive out of 53 granulomatous lymphadenitis. In the present study, benign category[L2] showed more prevalence (88.6%) which could be due to maximum sample size belongs 20 to 40 years. Similar observation was made by Rashmi(10),Pandya(6) and Sreelekshmi(7). On the contrary, studies by Gupta P et al., Vigilar[9,3] showed equal distribution between benign and malignant lesion catagories . In present study 24 cases(9.4%)are malignant belong to category L5,similar observation was made by Rashmi et al(10),Pandya et al(6) could be due less sample size of older age group[Table no.5].

Table no.5: Comparison

Category	Present study (255)	Rashmi et al (57)	Pandya et al (194)	Gupta et al (23335)	Vigliar E et al (300)
Non diagnostic[L1]	1.6%	00%	4.12%	4.1%	6.7%
Benign[L2]	88.6%	86%	61.34%	48.6%	34.7%
Atypical[L3]	00%	00%	3.09%	0.5%	8.3%
Suspicious[L4]	0.4%	1.7%	13.4%	1.4%	4.3%
Malignant[L5]	9.4%	12.3%	18.04%	45.5%	46%

The studies are very heterogeneous with marked variation in case numbers, different clinical settings, institutions, and population cohorts that may have different spectrums of disease and pretest rates of malignancy, different anatomical sites, varying use of Rapid On site Evaluation (ROSE) and varying use ancillary testing to make the diagnosis and establish categorization(8). The category definitions of the Sydney system were applied prospectively, for example, a case showing only necrosis in a country like ours where mycobacterial infection is endemic led to a diagnosis of caseous necrosis with appropriate special stains, but this may be regarded as nondiagnostic in a different country where mycobacterial infection is not endemic, or a case was regarded as "atypical lymphoid cells of uncertain significance" in our setting where ancillary testing was not available and was diagnosed as suspicious of malignancy based on the cytopathology and but with appropriate ancillary testing in a country where this is available would have been called a lymphoma. There is a long and successful history of using FNAB of superficial lymph nodes by palpation with correlation with clinical information, and in experienced hands, this is perfectly adequate. A preliminary categorization should be made and recorded, and in situations where ancillary tests are not available, this may be the end of the process or the patient may go on to excision biopsy[8].

CONCLUSION
Proposed Sydney system speeds up the reporting and helps to maintain uniformity in the reporting format and to follow treatment guidelines for patients.

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