

Morphological patterns of FNAC of lymph nodes

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Abstract

Introduction: Fine needle aspiration cytology is fast becoming preoperative method of choice for diagnosis and management of various lumps and lesions since few decades. It helps clinician to decide mode of treatment in most cases in both non-neoplastic and neoplastic disorders.

The aim of our study was to assess utility of FNAC in the diagnosis and management of lymph node disorders and distribution of these lesions according to different lymph node groups and age and sex distribution of these lesions.

Materials and Methods: The present study was done during the period between December 2015 and May 2017 in the department of pathology (central clinical laboratory), Koppal Institute of medical sciences, Koppal. 10ml syringe and 23/24 gauge needles were used for the procedure. Material obtained was expressed on slide and smears were made by standard smearing technique. Both wet and air dried smears were made. Wet smears were stained with Haematoxylin and Eosin stain and dry smears with Lieshman stain and Giemsa stain. Ziehl-Neelson staining for acid fast bacilli was done wherever required.

Results: We assessed 198 cases of lymphadenopathy cases. We got satisfactory aspirate in most (97.1%) cases. Cervical group of lymph nodes were most commonly (82%) involved. Granulomatous lesions were most common in young adults and reactive nonspecific lesions were most common in paediatric group. Metastatic carcinomas were most common type after 50yrs age group.

Conclusion: Fine needle aspiration is simple, rapid and cost effective method to know the cause of lymphadenopathy. It significantly reduced unnecessary surgical biopsy for diagnosis of lymphadenopathies in our case.

Keywords: FNAC, Lymph node, Morphology, Lymphadenopathy.

Introduction

Fine needle aspiration cytology (FNAC) is simple, fast, cost effective and well established diagnostic cytological method used to triage various lymph node lesions.^{1, 2} In many cases definitive diagnosis can be made. It is the initial investigation done for determining various pathologies of lymph nodes. It helps clinician to decide whether to treat that lesion or followed up as in reactive lymph nodes which themselves do not require treatment. In many cases it even helps in deciding the treatment avoiding time consuming, more complex, costly surgical excision and histopathological assessment and unnecessary hospitalisation in most lymphadenopathy cases.¹⁻³

This method evolved over time with better techniques with radiological guidance methods for better sensitivity and specificity and addition of ancillary tests like immunocytochemistry, culture and cytogenetic studies made it even more useful.¹⁻⁴

Most cases are reactive in nature. Few literatures showed tuberculosis as the most common cause of lymphadenopathy especially in India.⁴⁻⁶ Tuberculosis is quite common during adult age. Incidence of malignancy as cause of lymphadenopathy increases with age.

Objectives of present study were to assess and determine causes and morphological patterns of

lymphadenopathies using cytological method in this particular geographical area which is backward and which was out of reach of better healthcare facilities till now until medical education institution was established. Other objectives were to assess distribution of these lymph node lesions according age, sex and also with respect to different lymph node groups.

Materials and Methods

The present study was done during the period between December 2015 and May 2017 in the department of pathology (central clinical laboratory), Koppal Institute of medical sciences, Koppal. All the cases of lymphadenopathy referred from out patient department and wards of district hospital attached to Koppal institute of medical sciences were included in the study. Clinical details were obtained and proper aseptic precautions and consent were taken before the procedure.

10ml syringe and 23/24 gauge needles were used for the procedure. 10ml syringe creates good negative pressure and 23/24 gauge needles provide good material with minimal blood. While fixing the swelling between two left fingers needles were introduced in the lymph node and to and fro motion was done three to four times with creation of negative pressure in the syringe simultaneously to obtain material. In few cases

when lymph nodes were too small and slippery non-aspiration technique was used with only needle. Non aspiration technique is known to yield good material with very less haemorrhage.

Material obtained was expressed on the slide and smears were made by standard smearing technique. Both wet and air dried smears were made. Wet smears were stained with haematoxylin and eosin and dry smears with Lieshman stain and Giemsa stain. Ziehl-Neelson (ZN) staining for acid fast bacilli was done wherever required.

Lymph node lesions were classified based on following morphological criteria.

1. Reactive lymphadenitis (chronic nonspecific inflammation) – Presence of polymorphous population of lymphocytes with or without tingible body macrophages.
2. Granulomatous lymphadenitis – Presence of clusters or scattered epithelioid cells and giant cells without necrosis.
3. Necrotizing lymphadenitis – presence of only necrosis without cells
4. Necrotizing granulomatous lymphadenitis – Presence of epithelioid cells, giant cells and necrosis.
5. Tubercular lymphadenitis – Presence of acid fast bacilli in ZN staining with or without epithelioid cells and with or without caseous necrosis.
6. Metastatic malignancy- presence of metastatic cells

Results

There were total of 198 cases of lymphadenopathy. In 6 cases aspirate was inadequate and unsatisfactory. So total cases with adequate and satisfactory aspirate for diagnosis were 198(97.1%). Most were located in neck and most of these were cervical group of lymph nodes. All types of lesions were more common in cervical group of lymph nodes than in any other group of lymph nodes. Nearly 82% of lesions were located in cervical group of lymph nodes. This was followed by Submandibular group of lymph nodes (6%). The most common type of lesion was Reactive lymphadenitis (39.4%) followed by chronic granulomatous lymphadenitis (31.3). However the group constituting chronic granulomatous lymphadenitis, necrotizing granulomatous lymphadenitis, necrotizing lymphadenitis and tubercular lymphadenopathy constituted most common group of lesions i.e. nearly 44% cases (88). We labelled the case as tuberculosis only when it was positive for acid fast bacilli in Ziehl-Neelson stained smears. There were 12 tubercular cases (6.1%). When it comes to sex distribution of different lesions there was no significant difference in incidence. However suppurative lesions were quite common in females compared to men and metastatic malignancies were more common in males compared to females. Lymphadenopathy is seen in all age groups. About 31

cases (15.6%) are seen in paediatric age group. Reactive lymphadenitis was more common in children and young adults. Granulomatous lesions, necrotizing inflammation and tuberculosis were more common in adults. We have seen no cases of lymphomas. Most of metastatic malignancies were seen in individuals more than 50yrs. Among metastatic malignancies most were poorly differentiated. There were three cases of metastatic squamous cell carcinomas and one metastatic adenocarcinoma.

Discussion

In most cases we got satisfactory aspirate for confident cytological diagnosis. We got unsatisfactory aspirate only in 2.9% cases which is in accordance with most literature and Nitin Chawla et al.^{1,7}

Young adults (15-30yr) were most commonly affected by lymphadenopathy in our study. This finding is in accordance with most literature. In few studies older population (>40yrs) was most predominant group (Sumyra Khurshid Qadri et al).⁸

Female population was little more common in our study group compared to male population. This is in contradiction with studies of Nitin Chawla et al,⁷ Sumyra Khurshid Qadri et al⁸ where in male population were more in the study group compared female population. However few literatures showed male preponderance and few showed female preponderance in their study groups. Suppurative lesions were more common in females than males in our study in contradiction with Sumyra Khurshid Qadri et al⁸ where suppurative lesions were more common in males than females where as metastatic lesions were more common in males compared to females which is in accordance with Sumyra Khurshid Qadri et al.⁸ There is not much difference in incidence of lymphadenopathy between male and female population when it comes to tubercular/granulomatous lymphadenopathy.

The most common group of lymph nodes involved in our study was cervical group of lymph nodes. This finding is similar to Sumyra Khurshid Qadri et al,⁸ Ripunjaya mohanty.⁹ The second most common group of lymph nodes affected are submandibular group of lymph nodes. In few studies axillary group was second most common group affected (Sumyra Khurshid Qadri et al)⁸ and in few sub mental group of lymph nodes were second most common group involved (Ripunjaya mohanty et al).⁹

The most common morphological pattern of lymphadenopathy in our study was reactive nonspecific lymphadenitis which is in accordance with Nitin chawla et al,⁷ Ripunjay mohanty et al,⁹ Duraiswami et al,¹⁰ Atul shrivastav et al.¹¹ Reactive nonspecific lymphadenopathy is predominant cause in paediatric age group in accordance with most literature and Atul Shrivastav et al. However in few literature (Mangal Goneppanavar et al, Kandakuri Mahesh Kumar et al)

Granulomatous lymphadenitis and Tubercular lymphadenitis were more common than reactive non specific lymphadenitis. It could be because their study composed more of adult population than paediatric population as granulomatous lymphadenitis is most common cause of lymphadenitis in case of adult population as per most literature. Even in our study the group composed of granulomatous lymphadenitis, necrotising granulomatous lymphadenitis, necrotising lymphadenitis and tubercular lymphadenitis together constituted most common group than reactive group assuming that most cases of granulomatous inflammation in Indian context are because of tuberculosis. In our study also adult population is predominant than paediatric population. In that sense

tuberculosis as cause of lymphadenitis is in accordance with Mangal Goneppanavar et al, Kandakuri Mahesh Kumar et al. In one study (Sumyra Khurshid Qadri et al) lymphadenopathy because of metastasis was most common cause which is again because of predominant old age population in that study. This metastatic malignancy group was least common in our study. There were no cases of lymphomas in our study. Most cases of metastatic malignancies were poorly differentiated carcinomas (14), 3 were squamous cell carcinomas and one was adenocarcinoma out of 18 metastatic malignancies. These findings are in consistence with most literature.

Table 1: Age distribution of lesions

Age	0-14yr	15-30yr	31-50yr	51-70yr	>70yr	Total
Reactive lymphadenitis	23	31	16	8	00	78
Acute suppurative lymphadenitis	02	05	06	00	01	14
Chronic granulomatous inflammation	02	34	21	05	00	62
Necrotising granulomatous inflammation	02	04	07	00	00	13
Necrotising lymphadenopathy	00	01	00	00	00	01
Tubercular lymphadenitis	02	05	04	01	00	12
Metastatic malignancy	00	00	03	13	02	18
Total	31	80	57	27	03	198

Table 2: Sex distribution of lymph node lesions

	Male	Female	Total
Reactive lymphadenitis	39	39	78
Acute suppurative lymphadenitis	4	10	14
Chronic granulomatous inflammation	30	32	62
Necrotising granulomatous inflammation	6	7	13
Necrotising lymphadenopathy	0	1	01
Tubercular lymphadenitis	4	8	12
Metastatic malignancy	12	6	18
Total	95	103	198

Table 3: Distribution of lesions among different lymph node groups

Morphological pattern	Cervical	Submandibular	Axillary	Submental	Supraclavicular	Inguinal	Infra-auricular	Total
Reactive lymphadenitis	65	3	2	1	1	5	1	78
Acute suppurative lymphadenitis	9	2	1	0	2	0	0	14
Chronic granulomatous inflammation	47	5	4	2	3	1	0	62
Necrotising granulomatous inflammation	11		0	0	2	0	0	13
Necrotising lymphadenopathy	1	0	0	0	0	0	0	1
Tubercular lymphadenitis	10	1	0	0	0	1	0	12
Metastatic malignancy	15	2	1	0	0	0	0	18

Total	158	13	8	3	8	7	1	198
Inadequate	5	0	0	0	0	1	0	6
Total	163	13	8	3	8	8	1	204

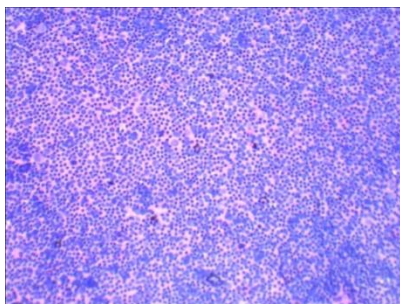


Fig. 1: Low power view of Reactive lymphadenitis (Giemsa stain)

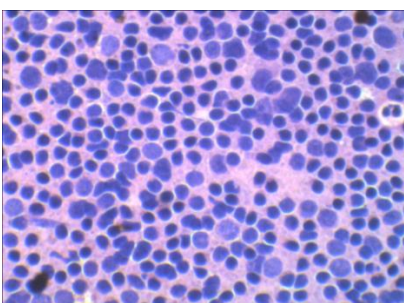


Fig. 2: High power view of Reactive lymphadenitis. (Giemsa stain)

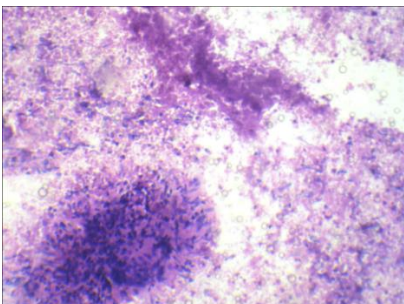


Fig.3: Tubercular Lymphadenitis (high power view) showing granuloma and caseous necrosis (Giemsa stain)

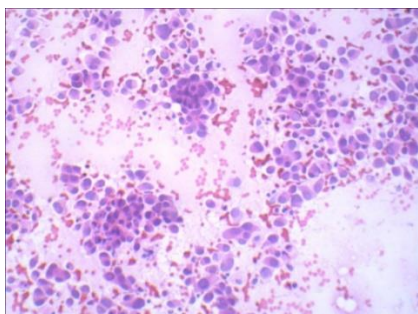


Fig. 4: High power view of Metastatic carcinoma (Giemsa stain)

Conclusion

FNAC is simple, rapid and cost effective method to know the cause of lymphadenopathy. Reactive and granulomatous inflammations are most common morphological pattern with cervical group of lymph nodes being most common group involved. It definitely and significantly reduced unnecessary surgical biopsy for diagnosis of lymphadenopathies in our case.

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