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## Analysis of cytological features and different patterns of granulomatous inflammation in lymph node aspirates

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### Abstract

**Aim:** study cytological features and different patterns of granulomatous inflammation in lymph node aspirates.

**Material and method:** The present prospective and retrospective study is carried out in 536 cases of clinical diagnosed lymphadenopathy for fine needle aspiration cytology in the department of pathology, Krishna Institute of Medical Sciences University, Karad, during the period of May 2005 to April 2008 (retrospective) and May 2008 to December 2010 (prospective).

**Result:** In our study of 122 granulomatous cases, 106 given as tuberculous lymphadenitis out of which 17 cases underwent for histopathological examination and 16 reported as tuberculous lymphadenitis except one which is given as reactive lymph node. Therefore % of false negative cases is 5.88%. In remaining eight granulomatous lesions, we could not find any causative agents like organisms, inclusion bodies or fungi with routine stain and even with special stains. These cases were subjected for lymph node biopsy and histopathological study.

**Conclusion:** In all these cases, careful clinical history like HIV positive status, H/O vaccination, cat bite and scratches and radiological investigation in case of sarcoidosis like chest X-ray and MRI findings and thorough clinical examination helped us to arrive at the diagnosis. The clinical history is far more important to arrive at particular diagnosis in some uncommon cases of lymphadenopathy. Thus to conclude, Fine Needle Aspiration Cytology is likely to be more successful is close knit setup with constant interaction and feedback between clinicians and pathologists.

**Keywords:** Cytological features, granulomatous inflammation

### Introduction

Lymph nodes are one of the major components of the immune system, acting as the second line of the defense of the body. Lymphadenopathy is term used for enlarged lymph nodes. Lymph nodes are involved in many disease processes and are one of the commonest organs to be aspirated today [1]. Lymphadenitis is acute and chronic inflammatory processes of lymph nodes that occur in response to a variety of pathogenic agents. Granuloma is defined as organized collections of macrophages that may take the form of epithelioid histiocytes and Langhan's giant cells [2].

Medical science is in a constant search to find out the simple procedures, to diagnose the disease in its earliest form, which is necessary for successful treatment.[2]Being a highly cellular organ and due to its poor fixation, biopsy interpretation of lymph nodes can prove to be one of the greatest challenge for practicing pathologist in addition to be an invasive procedure [3].

Fine Needle Aspiration Cytology (FNAC) is simple, safe, cost effective, repetitive, reliable, relatively less invasive OPD based procedure. Anesthesia is not required, hence can be applied on ambulatory as well as critically ill patients and in patients where biopsy is contraindicated [4]. As technically simple procedure, it can be easily performed at remote places in India, where trained staff is not available. It produces speedy results, hence widely accepted by the patients and clinicians [5].

### Material and methods

The present prospective and retrospective study is carried out in 536 cases of clinical diagnosed lymphadenopathy for fine needle aspiration cytology in the department of pathology, Krishna Institute of Medical Sciences University, Karad, during the period of May 2005 to April 2008 (retrospective) and May 2008 to December 2010 (prospective).

The fine needle aspiration cytology has been carried out on the patients from various IPD (medical and surgical wards), OPD as well as lab cases from outside with clinically diagnosed lymphadenopathy which are referred to department of pathology. Prior to performing FNAC,

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written consent of the patient was taken, clinical relevant history was noted and lymph node examination was done. Now the syringe plunger is retracted, creating proper negative pressure and without losing pressure the needle is moved in and out by the gentle movement of wrist. The cutting edge of the needle tip frees cells inside the swelling which are sucked in to the fine base of the needle. Using continuous negative pressure, by pulling firmly on plunger of syringe, guide the cutting tip of the needle forwards and backwards, obliquely through the firmly held swelling. While aspiration, hub of the needle is observed for any aspirate. This is an important step, as it is necessary to keep aspirated material in the needle and not to aspirate excessive blood which may dilute the aspirate. Before withdrawing the needle, the negative pressure is slowly released as if not performed; air will rush up the needle and loose the material in the syringe. After that needle is removed from the syringe and is filled with air and needle replaced firmly. The syringe is held slightly obliquely with the needle tip just above the glass slide, than the content of needle blown on the slide.

Smears are made by inverting a second slide over the material and as it spread, pulling the slides horizontally. All cases are broadly classified cytologically and comparisons with histological reports are done wherever possible. We compare our results with other similar studies.

**Observation**

The study retrospective (3years) and prospective (2 years) was performed in the department of pathology Krishna Institute of Medical Sciences, Karad. The cases were obtained from IPD and OPD patients attending cytopathology section. A total of 536 aspirations (FNAC) were performed. 122 cases reported as Granulomatous lymphadenitis. 27 cases reported as inadequate because of two reasons either lymph node was very tiny or the aspirate was acellular, hypocellular and heamorrhagic only.

**Table 1:** Age distribution of FNAC cases of granulomatous lymphadenitis.

Age range in years	No. of cases	Percentage (%)
0-10	10	08.19
11-20	16	13.11
21-30	27	22.13
31-40	29	23.77
41-50	13	10.65
51-60	17	13.93
61-70	06	04.92
71-80	03	02.46
81-90	01	00.81
Total	122	100

Cervical group of lymph node is most commonly involved hence aspirated in 56.56% cases followed by supraclavicular (13.93%) and axillary (12.30%) in cases. Whereas preauricular and Jugulodiagastric lymph node exhibited the least common site (0.80%). Total AFB positivity was 48.11%. AFB positivity was seen maximum in the third group (80.64%) with necrosis as predominant feature however in absence of AFBs, epithelioid cells remain the diagnostic feature in tuberculosis with clinical setting. Twenty two out of twenty four HIV positive cases reported as tuberculous lesion. Rests are given opportunistic infection as cryptococcal lymphadenitis. In our study of 122 granulomatous cases, 106 given as tuberculous lymphadenitis out of which 17 cases underwent for histopathological examination and 16 reported as tuberculous lymphadenitis except one which is given as

reactive lymph node. Therefore % of false negative cases is 5.88%. In remaining eight granulomatous lesions, we could not find any causative agents like organisms, inclusion bodies or fungi with routine stain and even with special stains. These cases were subjected for lymph node biopsy and histopathological study.

**Discussion**

This was a prospective as well as retrospective study carried out in department of pathology, KIMS University Karad, over a period of 5 years (May 2005- April 2010). A total of 536 patients with lymphadenopathy were referred to pathology department, and 122 cases diagnosed as granulomatous lymphadenitis on Fine needle aspiration cytology. FNAC being simple, safe, cost effective, minimally invasive, OPD based investigatory modality, and lymph nodes being an accessible organ when enlarged. Many Indian and western study had done on this topic [13].

In our study, the age group ranged from 1 month old male child with post-vaccinal lymphadenitis to 85 years old female with caseating tuberculous lymphadenitis [6-8]. The maximum numbers of cases were in fourth decade (23.77%) followed by third decade of life (22.13%). The following table shows the age group of our study with comparison to other groups [14].

In our study, males (64 cases) were seen to affected more than females (58 cases). The male to female ratio was 1.1: 1 In our study total distribution of well formed granulomas were 31.15%. Although the presence of Giant cells were not necessary for the diagnosis. Das D. K. (1992), Ersoz *et al.* (1998) also reported well formed granulomas 31.5% and 50.7% respectively with or without giant cells. 19.67% cases of granulomatous lymphadenitis showed Necrotising granulomas [9-12]. 95.80% cases showed granulomas present in the background of necrosis and polymorphs while only 4.20% cases showed macrophages [13]. and scattered epithelioid cells in the necrotic background with polymorphs. Caseating granulomas and purulent granuloma were present in 24.59% and 13.94% of cases. On aspiration cheesy white, thick material was aspirated and smear shows abundant amount of necrosis in almost all cases, Subhash K Gupta (1992) also reported almost comparable finding with our present study [16]. Though many conditions show epithelioid cell clusters and in tuberculosis we may not always get caseation or AFB positivity, then also we believe that diagnosis may be given as ‘granulomatous lymphadenitis suggestive of tuberculosis’. Although AFB [14]. positivity was maximally seen in necrosis with occasional epithelioid cells, sometimes there was no AFB positivity. In these situations, the diagnosis of ‘highly suspicious of tuberculosis’ was given in strong clinical suspicion, high ESR and positive X-ray due to high incidence of tuberculosis in India [17]

Two cases, one 40 years male and another 30 years female presented with supra clavicular and cervical lymphadenopathy having clinical suspicion of tuberculosis aspirated and diagnosed as ‘cryptococcal lymphadenitis’. Many encapsulated yeast forms of Cryptococcus neoformans along with scattered lymphocytes were seen in the aspirate and special stains like India ink stain confirmed the diagnosis on wet smear preparation [18]

Two children aged 2 months and 1 month both with cervical lymphadenopathy and history of recent BCG vaccination were aspirated and diagnosed as post-vaccinal lymphadenitis. The aspirate showed mixed population of lymphoid cells, and occasional granulomas with the background of blood. The

clinical history of vaccination and cytological appearance helps us to reach the diagnosis<sup>[19]</sup>.

In our study, overall AFB positivity was seen in 87.50% cases which were more than that of HIV negative cases (41.80%). Necrosis pattern shows 92.86% AFB positivity while granulomas with necrosis 85.72% positivity and 66.66% positivity in granulomas without necrosis. These cytomorphological patterns also reveals higher incidence of AFB positivity than those of HIV negative patients<sup>[20]</sup>.

### Conclusion

Tuberculosis is the most common cause of granulomatous lymphadenitis in India. Though some uncommon but interesting cases in this study are *Cryptococcal lymphadenitis*, *Post-vaccinial lymphadenitis*, *Erythema nodosum leprosum*, *cat scratch disease*, *Sarcoidosis*, and *Foreign body granuloma*. In all these cases, careful clinical history like HIV positive status, H/O vaccination, cat bite and scratches and radiological investigation in case of sarcoidosis like chest X-ray and MRI findings and thorough clinical examination helped us to arrive at the diagnosis. The clinical history is far most important to arrive at particular diagnosis in some uncommon cases of lymphadenopathy. Thus to conclude, Fine Needle Aspiration Cytology is likely to be more successful is close knit setup with constant interaction and feedback between clinicians and pathologists.

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