

# Cytomorphological Features of Tuberculous Lymphadenitis on FNAC

Ruchi Khajuria, Kuldeep Singh

## Abstract

FNAC smears of 343 cases diagnosed as tuberculous lymphadenitis in the Postgraduate Department of Pathology, Government Medical College, Jammu over a period of three years were reviewed. All the available smears stained by May Grunwald Giemsa and Papani Colaou method including Ziehl Neelsen stain for acid fast bacilli in some cases were evaluated. The disease was seen most frequently in the second and third decades of life (58.9%) with slight female preponderance. Cervical region was the most common site of involvement (83.4%). Three cytomorphological patterns were noted: epithelioid granuloma with necrosis was the most frequent pattern (pattern 2) in 49.3 %, followed by necrotic material without granuloma in 30.6% (pattern 3) and epithelioid cells without necrosis in 20.1% cases (pattern 1) . The AFB positivity rates were 52.9 % and 78% in cytological patterns 2 and 3 respectively with no positivity in pattern 1. Overall positivity for AFB was 64%.

## Key Words

Lymph Node, Lymphadenitis, Tuberculosis

## Introduction

Lymphadenopathy is one of the common clinical problems with varied etiological considerations. The discovery and speedy diagnosis of enlarged lymphnodes is of great clinical importance. Fine needle aspiration cytology (FNAC) has become an important adjunct to the study of peripheral lymphadenopathy, as a rapid, reliable and inexpensive method of making a diagnosis and is particularly relevant in developing countries like India where facilities for surgical biopsy are scarce.

Tuberculous lymphadenitis is one of the most common causes of lymph node enlargement in developing countries (1). FNAC plays an important role in diagnosing tuberculous lymph nodes and prevents unnecessary surgery. Cytodiagnosis of tuberculosis depends on demonstration of epithelioid cells with or without Langhans giant cells and necrosis. Bacteriological confirmation is required by Ziehl Neelsen (ZN) stain/culture for acid fast

bacilli (AFB). Treatment of tuberculosis can be straight away started after FNAC diagnosis by correlation with clinical findings and other investigations. The present study was done to determine role of FNAC in the diagnosis of tuberculous lymphadenitis and various cytomorphological presentations in relation to AFB positivity.

## Material and Methods

The present study consisted of retrospective analysis over a period of three years, in which records of patients presenting with peripheral lymphadenopathy aspirated in Cytology section of Pathology department, Govt. Medical College Jammu were examined with respect to age, sex, clinical diagnosis, site of lesion and cytological diagnosis. All the available smears stained by May Grunwald Giemsa ( MGG), Papani Colaou (PAP) and ZN stain were reviewed. The diagnosis of tuberculosis was

From the Deptt. of Pathology, Govt. Medical College Jammu- J&K India

Correspondence to : Dr. Ruchi Khajuria, Assistant Professor, Postgraduate Department of Pathology, Govt. Medical College, Jammu, J&K-180001

**Table 1. Incidence of Various Types of Cytological Pictures on Aspirates In Patients with Tuberculous Lymphadenitis**

| Pattern | Cytological picture                             | No of patients | %age |
|---------|---|----------------|------|
| 1       | Epithelioid granuloma without necrosis          | 69             | 20.1 |
| 2       | Epithelioid granuloma with necrosis             | 169            | 49.3 |
| 3       | Necrotic material without epithelioid granuloma | 105            | 30.6 |

**Table 2. Results of AFB Staining in 64 Patients with Tuberculous Lymphadenitis**

| Pattern | Cytological picture                             | No of cases in which ZN staining done | No of cases positive for AFB | %age positivity |
|---------|---|---------------------------------------|------------------------------|-----------------|
| 1       | Epithelioid granuloma without necrosis          | 6                                     | 0                            | 0               |
| 2       | Epithelioid granuloma with necrosis             | 17                                    | 9                            | 52.9            |
| 3       | Necrotic material without epithelioid granuloma | 41                                    | 32                           | 78.0            |
|         | Total   | 64                                    | 41                           | 64.0            |

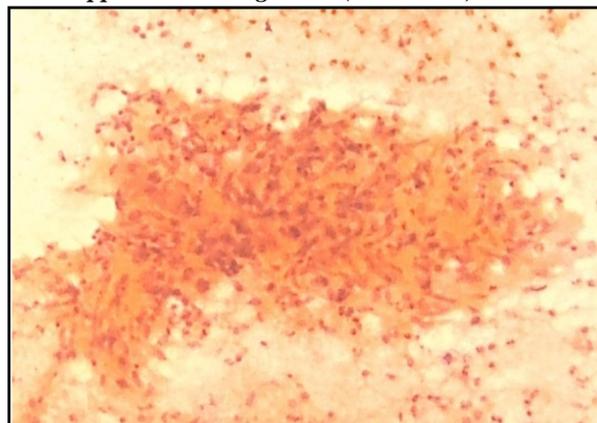
suggested based on characteristic cytomorphological features consisting of epithelioid cell aggregates with or without Langhan giant cells and necrosis and confirmed by ZN stain in some cases. Culture for AFB was advised in some cases. Further correlation with clinical findings and other investigations were advised.

**Results**

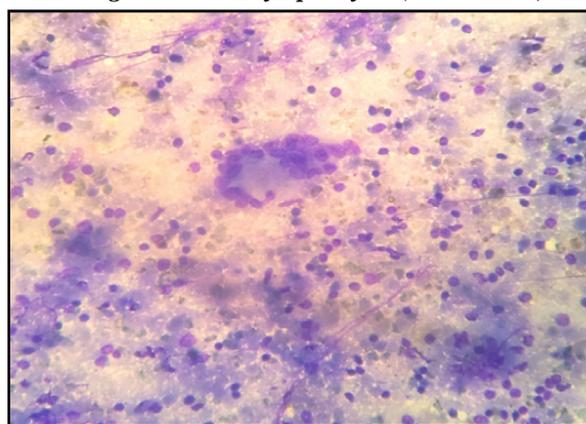
343 cases showing tuberculous morphology and caseation necrosis were recorded. The disease was more commonly seen in second and third decades (58.9%) with slight female preponderance with male to female ratio of 1 :1.3. Most common involvement was in cervical lymphnodes (83.4%) and least common in inguinal group (1.75%).

Common cellular components encountered in the smears were lymphocytes, neutrophils, macrophages, epithelioid cells and Langhans giant cells with or without accompanying necrosis. The cytological patterns resulting from different combinations of above mentioned components are depicted in *table 1*. The most common combination was presence of epithelioid cell clusters with necrosis in 49.3% (pattern 2). In addition to epithelioid cells, amorphous cellular debris or necrotic material was present (*Fig 1*). Lymphocytes and Langhans giant cells were also seen. Giant cells were seen in 30.1 % of such cases (*Fig 2*). The next cytological appearance (pattern 3) in order was amorphous acellular material without epithelioid and giant cells in 30.6% (*Fig 3*). Degenerating

**Fig 1. Shows Large Epithelioid Cell Cluster in a Necrotic Suppurative Background (PAP x 400)**

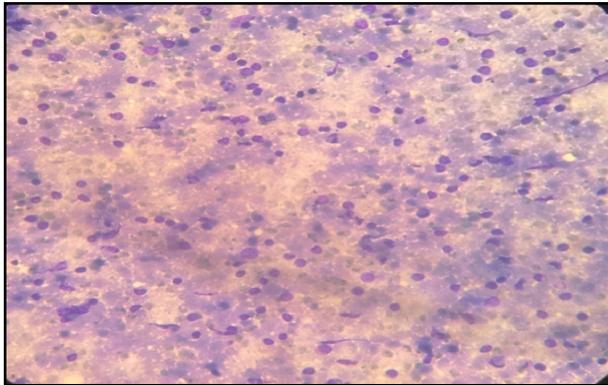


**Fig 2. Shows Langhans Giant Cell in a Necrotic Granular Background with Lymphocytes (MGG x 400)**



polymorphonuclear leucocytes and lymphoid cells were seen in the background. Epithelioid cell clusters without necrosis were seen in 20.1% (pattern 1)). The background

**Fig 3. Shows Caseation Necrosis with Lymphoid BackGround (MGGX400)**



consisted of reactive lymphoid cells. Giant cells were seen in 39.1% of such cases.

ZN stain for AFB was carried out in 64 patients. The overall positivity for AFB was 64% (Table 2). The highest frequency of positivity was seen in pattern 3 showing only necrosis without accompanying epithelioid cell aggregates (78%). AFB positivity in pattern 2 depicting epithelioid cell clusters with necrosis was 52.9%. None of the smears from pattern 1 showing epithelioid aggregates without necrosis showed AFB positivity.

### Discussion

The present study is a review of smears of cases diagnosed as tuberculous lymphadenitis to determine cytological features characteristic of tuberculosis which help in quick diagnosis of the disease on FNAC of enlarged lymph nodes along with ZN stain for AFB. The technique of FNAC is very popular and readily acceptable in our country because of it being a simple, safe, inexpensive and reliable method of tissue diagnosis and is invariably used as first line investigation in lymphadenopathy.

Cytodiagnosis of tuberculosis depends on demonstration of epithelioid cells and Langhans giant cells with or without accompanying necrosis (2-6). Three cytomorphological patterns were noted in our study: epithelioid cell clusters in reactive lymphoid background, epithelioid cells with necrosis and necrosis without epithelioid cells. Giant cells were present in all groups except the last pattern. Nevertheless finding of epithelioid cells is the first step in establishing diagnosis supported

by other morphological, microbiological, molecular and clinical findings. Similar distribution of cytological patterns with predominance of epithelioid cell clusters with necrosis has been reported in other studies (7-8) whereas pattern 3 was the most common in some studies (9-11). Pattern 1 was the least common in all studies which is in agreement with our observations. Hemlatha et al have reported a fourth pattern with numerous macrophages seen in AIDS patients (7). We did not encounter such pattern in our study. Giant cells were seen in first and second patterns and always accompanied by epithelioid cells clusters. The cytomorphologic patterns to some extent denote immune status of the individual. In Western countries, demonstration of epithelioid cells in lymph node aspirates may suggest sarcoidosis as the first possible diagnosis, but in India, this finding would suggest tuberculosis unless proved otherwise, since the disease is rampant here (12). Epithelioid cells have been considered most important for the diagnosis of tuberculosis and they were present in 69% of our cases of tuberculous lymphadenitis. Giant cells on the other hand were seen in 22.8% of the cases. In pattern 1 and 2 consisting of 69.4% of all cases, the diagnosis of tuberculosis was easier to suggest due to presence of characteristic epithelioid cell clusters with or without necrosis. In pattern 3 consisting of 30.6% of cases, smears showed only necrotic material. Amorphous granular necrosis with lymphoid background is highly suggestive of tuberculosis. However, diagnosis is confirmed by demonstration of AFB by ZN stain/culture. In our study, AFB positivity was 78% in pattern 3 whereas positivity was 52.9% in pattern 2 and no positive result in pattern 1. Overall positivity for AFB was 64%. Our study has revealed inverse relationship of epithelioid cell granulomas with AFB positivity which appeared directly related to the presence of necrotic material. This finding is in agreement with the observation of many studies with overall positivity of AFB ranging from 44.5% to 75% with highest positivity in cases showing only necrotic material (7-10). Necrotizing and suppurative patterns are more commonly seen in immunocompromized patients with a higher and heavy

positivity for AFB (5). There are some problems in arriving at definitive diagnosis of tuberculous lymphadenitis, particularly when epithelioid and Langhan giant cells are not seen in smears and aspirates only contain caseous material or pus and bacteriological confirmation is required in such cases by ZN stain/ culture for AFB.

The overall positivity for AFB was 64% (Table 2) but in this group 78% cases were positive. 9 cases (22%) in pattern 3 cytological picture were not positive on ZN stain and hence culture for mycobacteria was advised.

However, no follow up data was available. Absence of granuloma /necrosis from cases of early tuberculosis may also give false negative results. PCR has been found valuable in such cases with 100% diagnostic success if FNAC is combined with PCR (13).

Difficulty also arises in pattern 1, as epithelioid cell clusters can be seen in sarcoidosis, brucellosis, occasionally in malignancies like Hodgkins disease and metastatic neoplsms. Balaji *et al* (14) reported their experience of FNAC in childhood TB lymphadenitis with sensitivity and specificity of 98 % and 100% respectively. Value of FNAC lies in positive diagnosis. Large number of cases of lymphadenopathy can be confidently dignosed on cytomorphological features of granulomatous inflammation with clinical correlation and augmented by ZN stain for AFB.

### Conclusion

FNAC of enlarged lymph nodes is a simple, quick and reliable method of making diagnosis of tuberculosis based on cytomorphological evaluation and ZN stain for AFB.

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