Research Paper Medical Science

# Fine Needle Aspiration Cytology for the Diagnosis of Tuberculous Lymphadenopathies


| | |
|---|---|
| **DR YOGENDRA MADAN** | TUTOR, M. D. PATHOLOGY, M. P. SHAH MEDICAL COLLEGE JAMNAGAR |
| **DR VANI SANTOSH JOSHI** | 3RD YEAR RESIDENT, PATHOLOGY DEPARTMENT M. P. SHAH MEDICAL COLLEGE JAMNAGAR |
| **DR R VARADHARAJA PERUMAL** | 3RD YEAR RESIDENT, PATHOLOGY DEPARTMENT M. P. SHAH MEDICAL COLLEGE JAMNAGAR |



**ABSTRACT**

Background: Tuberculous lymphadenopathy is an important form of extrapulmonary tuberculosis. The role of fine needle aspiration cytology (FNAC) in the diagnosis of such lesions is a well-known fact.
Aims: To study the distribution of cytomorphological patterns of tuberculous lymphadenitis. and role of repeat aspiration in diagnosing tuberculous lymphadenitis.
Methods: The study was conducted in the department of Pathology, Shri M.P.Shah Medical College, Jamanagar, from December 2013 to May 2014. Detailed clinical history with relevant investigations were taken. FNACs were done and the smears were stained with May-Grünwald Giemsa and Ziehl-Neelsen stain.
Results: Out of 180 lymph node aspirations 74 cases were diagnosed as tuberculous lymphadenitis. Four cytomorphologic patterns were observed:
1) Caseating epithelioid granulomas: 42 cases (56.7%).
2) Granulomatous: 23 cases (31.1%).
3)Necrotising lymphadenitis: 7 cases (9.4%),
4) Necrotising and suppurative: 2 cases (2.8%).
AFB positivity was seen in 32 cases (43.24%).
58 cases showed reactive lymphadenitis repeat aspiration was advised after a course of antibiotics. Out of 18 cases that turned-up for re-aspiration, 11 cases showed subsequent development of epithelioid granulomas, whereas the others still had reactive features.
Conclusion: FNAC is a useful tool in the diagnoses of tuberculous lymphadenitis, and repeat aspiration after 2 - 3 weeks helps in providing the correct diagnosis of early tubercular lesions.


**KEYWORDS** Tuberculous lymphadenitis, caseating epithelioid granuloma, necrotising lymphadenitis.

**Introduction**
Despite progress in prophylaxis and therapy, tuberculous lymphadenitis still remains a rampant health problem in developing countries. With the arrival of HIV/AIDS in India, tuberculosis (including tuberculous lymphadenitis) is on the rise. Fine needle aspiration technique was described first by Greig and Gray in 1904 who used this procedure in the diagnosis of trypanosomiasis. In 1921, Guthrie attempted to correlate lymph node aspiration cytology with various disease processes (1). Since then there is no looking back. Various different cytomorphologies were encountered in day-today reporting of tuberculous lymphadenitis and typical epithelioid granulomas were found in some of the reaspirated cases diagnosed as reactive lymphadenitis with activated histiocytic clusters. Thus, this study was undertaken to determine the distribution of various cytomorphologies encountered, and the role of

reaspiration cytology for demonstrating the subsequent development of granuloma.

**Materials and methods**
The study was conducted at the department of Pathology, Shri M.P.Shah medical college, Jamanagar from December 2013 to May 2014. Patients with peripheral lymphadenopathy having clinical suspicion of TB and attending cytology OPD, G.G.G hospital were enrolled for the study. Detailed clinical history including duration of swelling, sites, sizes, consistency, and mobility were taken into account before subjecting to aspiration. The relevant laboratory investigations, and chest X-ray were taken into account. After explaining the procedure to the patient, aspirations were done using 24G needle, 20 cc disposable syringe. All the slides were air-dried and stained with MGG and ZN stain. Detailed cytomorphologies were studied. A repeat aspiration was advised in those patients diagnosed as reactive lymphadenitis with activated histiocyte clusters after 2 - 3 weeks.

**Results**
Out of the 180 aspirations from various peripheral lymph-adenopathies, 74 cases were diagnosed as TB lymphadenitis, and 58 cases as reactive lymphadenitis with activated histiocyte clusters. The age of the patients ranged from 4 years to 75 yrs with a median age of 34 yrs. The age group between 20 - 30 yrs was mostly affected. The male: female ratio was 1: 08. Among the various sites of lymph node involvements, cervical lymphnodes were the most common – 48 cases (64.8%) followed by axillary, supraclavicular nodes (Table 1)

**Table 1:Table showing various sites of involvement**

| Site | Number | % |
|---|---|---|
| Cervical | 48 | 64.8 |
| Axillary | 10 | 13.5 |
| Inguinal | 02 | 02.7 |
| Supraclavicular | 08 | 10.8 |
| Multiple | 06 | 08.2 |

**On the basis of cytomorphological analysis, TB lymphadenitis were categorised into 4 patterns (Table 2):**

1. Classical caseating epithelioid granulomas –42 cases(56.7%), which showed epithelioid granuloma, caseation necrosis with or without giant cells in milieu of lymphoid cells
2. Granulomatous lymphadenitis –23 cases (31.1%), which showed only epithelioid granuloma with or without giant cells.
3. Necrotising lymphadenitis –7 cases (9.4%), which showed degenerating epithelioid cells in a necrotic background.
4. Necrotising and suppurative –2 cases (2.8%), which showed degenerating and viable neutrophils in a necrotic background.

**Table 2:Table showing cytomorphological pattern and AFB positivity**

| Sr no | Cytomorphological pattern | Number(% of total) | AFB positivity (number/%) |
|---|---|---|---|
| 1 | caseating epithelioid granulomas | 42(56.7%) | 17(40.4%) |
| 2 | Granulomatous lymphadenitis | 23(31.1%) | 06(26.1%) |
| 3 | Necrotising lymphadenitis | 07(9.4%) | 07(100%) |
| 4 | Necrotising and suppurative | 02(2.8%) | 02(100%) |

A definitive cytologic diagnosis of TB lymphadenitis could be considered in the smears with the first two patterns, while the third and fourth could be dismissed as acute suppurative lymphadenitis in the absence of a positive ZN stain. Different patterns showed varied AFB positivity (Table 2). The necrotising lymphadenitis and necrotising and suppurative lymphadenitis patterns showed 100% AFB positivity. The other two patterns i.e.,caseating epithelioid granuloma and granulomatous lymphadenitis had AFB positive only in 42(40.4%) and 23(31.1%) cases respectively.

In addition to the above four groups, a fifth group comprising poorly developed/doubtful epithelioid cells or occasional epithelioid cells without characteristic necrosis/giant cells has been encountered. In this group, where there are micro foci of activated macrophages in a background of reactive lymphadenitis, a follow-up re-aspiration is required to look for subsequent development of granuloma. 58 cases were diagnosed

as reactive lymphadenitis with activated histiocytes collection. These cases were advised a repeat aspiration after 2 - 3 weeks. 18 cases turned-up for repeat aspiration out of which 11 cases (61.1%) developed epithelioid granuloma, and AFB was seen in 6 cases.7 cases (38.9%) still remained with reactive features.

**Discussion**

Tuberculosis being common in our country, it is not surprising that TB lymphadenopathy continues to be one of the commonest causes of chronic lymph node enlargement. Pandit et al stated that considering the overall prevalence of tuberculosis in the Indian context, the presence of epithelioid cell granulomas is indicative of tuberculosis (2). Fine needle aspiration cytology in the diagnosis of tuberculous lymphadenitis is simple, safe, cost-effective, and conclusive(3). The diagnostic cytomorphologic findings comprise epithelioid granulomas and giant cells – with or without necrosis (4). Many-a-times an acute inflammatory exudate is obtained. AFB stain immensely augments diagnosis. Many workers have found many cytomorphologic patterns in the aspirates of tuberculous lymphadenitis . Metre and Jayaram (5) described three cytomorphologies:

1) Epithelioid granulomas with or without giant cells, 2 )Degenerating epithelioid granulomas, and 3) Necrotising and suppurative.

Similar to the study by Nayak *et al* (6), we found four patterns described. Das ***et al*** (7), and Llatjos *et al* (8), also described three patterns. Comparison of different cytomorphologic patterns by various workers is shown in Table 3.

**Table 3: Comparison between various other studies.**

| | | caseating epithelioid granulomas | Granulomatous lymphadenitis | Necrotising lymphadenitis | Necrotising and suppurative |
|---|---|---|---|---|---|
| 1 | Ng *et al* | 18 | 66 | 07 | 09 |
| 2 | Das *et al* | 39.1 | 25.3 | 35.6 | - |
| 3 | Llatjos *et al* | 30.43 | 17.29 | 52.17 | - |
| 4 | Present study | 56.7 | 31.1 | 9.4 | 2.8 |

The cytomorphologic patterns to some extent denote the immune status of the individuals. Necrotising and suppurative patterns are more commonly seen in immunocompromised patients with a higher and heavy positivity of AFB.

This study showed that TB lymph node was not limited to younger age groups. No age group was exempted. Furthermore, the disease was not limited to the cervical lymph node either. Axillary and inguinal lymph nodes were also affected. These findings were similar to the study by *Ng et al* (9).

Detection of AFB in aspiration smears varies with the cytomorphological features in tuberculous lymph nodes. As was the observation by Malakar *et al* (10) we also found higher AFB positivity in smears containing necrotic materials.

TB lymphadenitis has unique stages (Jones *at al* (11)). Characteristically, more than one lymph is nvolved

in this disease. So, variable numbers of lymph nodes with variable stages are also a characteristic finding. These pathologic characteristics may be closely related to the outcome of fine needle aspiration cytology. Aspirates from stage one or two tuberculous lymphadenitis usually provide inflammatory cells as seen in reactive lymphadenitis. Thus, FNAC of these stages can only be nonspecific reactive. Typical necrotic materials or tubercle bacilli can be seen in the advanced stages in which an abscess is readily formed in the core of the lymph node(12). So aspirates from an early stage lymph node were the main cause of low sensitivity. If lymph node aspiration was done once in the early stage, the

diagnosis is likely to be dismissed as a reactive node. This study shows that re-aspirating after one or two weeks, i.e., waiting for the development of granuloma, the diagnostic efficacy improves. It is therefore necessary to follow the patients whose clinical findings are compatible with TB lesions.

**Conclusion**

FNAC being a reliable, safe, rapid, and economical procedure, is useful as an outdoor diagnostic procedure for the diagnosis of tubeculous lymphadenitis. From the cytomorphologic pattern and the AFB positivity, a rough estimate about the immune status can be made. The usefulness of repeat aspiration in patients with strong clinical suspicion of tuberculous lesions is well documented in the study

## REFERENCES

1. Narang RK, Pradhan S, Singh RP, Chaturvedi S. Place of fine needle aspiration cytology in the diagnosis of lymphadenopathy. Ind J Tub 1990; 37: 29-31. | 2. Pandit AA, Khilani PH, Prayag A. Tuberculous lymphadenitis: extended cytomorphologic features. Diagn Cytopathol 1995; 12: 23-7. | 3. Singh JP, Chaturvedi NK, Das A. Role of fine needle aspiration cytology in the diagnosis of tubercular lymphadenitis. Indian J Pathol Microbiol 1989; 32 (2): 101. | 4. Verma K, Kapila K. Aspiration cytology for the diagnosis of tuberculosis-perspectives in India. Indian J Pathol Microbiol 2002; 69 (Suppl 1): S39-43. | 5. Metre MS, Gita J. Acid fast bascilli in aspiration smear from tuberculous lymph nodes: An analysis of 255 cases. Acta Cyto 1987; 31: 17-9. | 6. Nayak S, Puranik SC, Deshmukh SD et al. Fine needle aspiration cytology in the tuberculous lymphadenitis of patients with or without HIV infection. Diagn Cytopathol 2004; 31 (4): 204-6. | 7. Das DK, Pank JN, Chachra M et al. Tuberculous lymphadenitis: correlation of cellular components and necrosis in lymph node aspirate with AFB positivity and bacillary count. Indian J Pathol Microbiol 1990; 33: 1-10. | 8. Llatjos M, Romeu J, Clotet B et al. A distinctive cytologic pattern for the diagnosing TB lymphadenitis in AIDS. J Acquir Immune Defic Syndr 1993; 6 (12): 1335-8. | 9. Ng WF, Kung ITM. Pathology of tuberculous lymphadenitis: A fine needle aspiration approach. J Hong Kong Med Assoc 1990; 42 (1): 18-21. | 10. Malakar D, Jajoo ILN, Kiran S et al. A clinical evaluation of fine needle aspiration cytology in the diagnosis of lymphadenopathy. Ind J Tub 1991; 38: 17-9. | 11. Jones PG, Campbell PE. Tuberculous lymphadenitis in childhood: The significance of anonymous mycobacteria. Br J Surg 1962; 50: 302-14. | 12. Suh KW, Park CS, Lee JT, Lee KG. Diagnosis of cervical tuberculous lymphadenitis with fine needle aspiration biopsy and cytologic examination under ultrasonographic guides. Yonsei Med Journal 1993; 34 (4): 228-333. |