

## ORIGINAL RESEARCH

# Fine needle aspiration cytology for the diagnosis of tuberculous lymphadenopathy

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### 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 in a tertiary care hospital in central India from January 2022 to March 2023. 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) **Non caseating 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 diagnosis of tuberculous lymphadenitis and repeat aspiration after 2-3 weeks helps in providing the correct diagnosis of early tubercular lesions.

**Key words:** Tuberculous lymphadenitis, caseating epithelioid granuloma, necrotising lymphadenitis

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### 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 <sup>1</sup>. Since then there is no looking back. Various different cytomorphologies were encountered in day-to-day 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 in the department of Pathology, in a tertiary care hospital in central India from January 2022 to March 2023. Patients with peripheral lymphadenopathy having clinical suspicion of TB and attending cytology OPD, 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, 10 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 histiocytic clusters after 2-3 weeks.

### RESULTS

Out of the 180 aspirations from various peripheral lymphadenopathies, 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 75yrs with a median age of 34 yrs. The age group between 20-30 years was mostly affected. The male: female ratio was 1: 0.8. Among the various sites of lymph node

involvements, cervical lymph nodes 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. Non caseating 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.	Non caseating 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 non-caseating 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 small 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 cause 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<sup>2</sup>. Fine needle aspiration cytology in the diagnosis of tuberculous lymphadenitis is simple, safe, cost-effective, and conclusive<sup>3</sup>. The diagnostic cytomorphologic findings comprise epithelioid granulomas and giant cells with or without necrosis<sup>4</sup>. 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<sup>5</sup> described three cytomorphologies:

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

Similar to the study by Nayak *et al.*,<sup>6</sup> we found four patterns described. Das *et al.*,<sup>7</sup> and Llatjos *et al.*,<sup>8</sup> 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	Non caseating Granulomatous lymphadenitis	Necrotising lymphadenitis	Necrotising and suppurative
1.	Ng <i>et al.</i> , <sup>9</sup>	18	66	07	09
2.	Das <i>et al.</i> , <sup>7</sup>	39.1	25.3	35.6	-
3.	Llatjos <i>et al.</i> , <sup>8</sup>	30.43	17.29	52.17	-
4.	Presentstudy	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. Further more, 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.*,<sup>9</sup>.

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

TB lymphadenitis has unique stages (Jones *et al.*<sup>11</sup>). Characteristically, more than one lymph is involved 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 lymphnode<sup>12</sup>. 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 tuberculous 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.

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