

Extrapulmonary tuberculosis: Fine needle aspiration cytology diagnosis

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Abstract

Background: The increasing prevalence of extrapulmonary manifestation of tuberculosis with the HIV scourge is a cause for concern.

Objective: To determine the role of fine needle aspiration cytology (FNAC) in the diagnosis of extrapulmonary tuberculosis.

Patients and Methods: This is a consecutive 9-year analysis of patients with peripheral lymphadenopathy. All the patients had fine needle aspiration. Smears were made, fixed in 95% alcohol and stained with hematoxylin and eosin and Zeihl Neelsen stains.

Results: 48 patients, 31 males and 17 females, were analyzed. The mean age was 27.9 years. Aspirates were mainly from cervical lymph nodes. Four patients were HIV 1 seropositive. Macroscopically, 23 (48%) of the aspirates were purulent and 7 (14.6%) had caseous material. Microscopy showed granular eosinophilic material (caseation), multinucleated giant cells, epithelioid cells, neutrophils and lymphocytes. Staining for acid-fast bacilli was positive in 23 (48%) cases.

Conclusion: Early diagnosis of extrapulmonary tuberculosis in a resource-limited setting can be achieved with fine needle aspiration cytology technique (FNAC). This will ensure prompt treatment and thus reduce attendant morbidity and mortality.

Key words: extrapulmonary tuberculosis, diagnosis, fine needle aspiration cytology

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Introduction

Extrapulmonary manifestation of tuberculosis is prevalent in developing countries and its diagnosis is often delayed, thus increasing the morbidity and mortality of the disease.^[1-3]

Extrapulmonary tuberculosis often manifests as peripheral lymphadenopathy or palpable intra-abdominal masses and can be diagnosed by fine needle aspiration cytology (FNAC), a technique that is gaining increasing acceptance in the diagnosis of palpable masses and lymphadenopathies.^[4-6]

Patients and Methods

This is a consecutive 9-year analysis of patients with palpable peripheral lymph node enlargement, seen in the Department

of Histopathology/Morbid Anatomy, Ahmadu Bello University Teaching Hospital, Shika Zaria from January 2000 to December 2008. Patients were referred from the hospital wards and outpatient clinics. They were all subjected to FNA using a disposable 21-gauge needle and 20-ml disposable plastic syringe with the aid of a Cameco syringe holder. Aspirates were smeared on microscopic slides and immediately fixed in 95% alcohol and stained using Leishman, Papanicolaou, Hematoxylin and Eosin and Ziehl Neelsen stains specific for acid-fast bacilli (AFB) of *Mycobacterium tuberculosis*.

Results

Forty-eight patients with peripheral lymphadenopathies

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were subjected to FNAC. They consisted of 31 males and 17 females. Their ages ranged from 1.5 to 55 years and the mean age was 27.9 years. Four of the patients were HIV seropositive [Table 1].

The average size of the nodal enlargements was 8 × 6 cm as the widest diameter, while the aspirate yield was on average 0.5 ml.

Aspirates were mainly from the following: lymph nodes 43 (89.6%), breast 4 (8.3%) and peri-umbilical mass 1 (2.1%). Of the lymph node aspirates, cervical accounted for 31 (72.1%), axillary 5 (11.6%), supraclavicular 5 (11.6%) and submandibular 2 (4.7%).

Macroscopically, 23 (47.9%) of the aspirates were purulent, 18 (37.5%) were blood stained and 7 (14.6%) had caseous material [Table 2].

Microscopy showed epithelioid cells in all specimens, granular eosinophilic material (caseation) in 27 (56.3%), polymorphs (mainly neutrophils) in 35 (72.9%) and multinucleated giant cells in 12 (25%) cases [Figures 1 and 2].

AFB were positive in 23 (47.9%) specimens. The remaining had cytological features consistent with tuberculosis.

Discussion

The diagnostic dilemma posed by extrapulmonary tuberculosis in resource-limited developing countries can

be curtailed by FNAC, a relatively cheap and less invasive procedure with a high diagnostic accuracy.^[7] FNAC's reliability in the initial evaluation of extrapulmonary tuberculosis has been reported.^[4]

Extrapulmonary tuberculosis constitutes 10–27% of tuberculosis and it accounts for a significant proportion of tuberculosis impact on health.^[8–11] The clinical manifestation of extrapulmonary tuberculosis is variable; thus, diagnosis is often delayed resulting in increased morbidity and mortality.^[7,10,11]

This study showed a male preponderance (64.6% males and 35.4% females) which is comparable to other reports showing that men are more exposed to tuberculosis than women.^[12,13] However, the mortality rate is higher in young adult females than in men.^[14,15]

Cervical lymph nodes are the commonest extrapulmonary site of tuberculosis and high frequency in this site in our study supports earlier reports.^[16,17]

The sizes of the nodal enlargements have a direct effect on the aspirate yield.^[18] Large-sized nodes are better for proper evaluation as seen in our patients.

FNA diagnostic microscopic features include epithelioid cells, multinucleated giant cells, caseation evidenced by the presence of eosinophilic granular material and presence of acute inflammatory exudates, mainly polymorphs.^[7,18] Pathognomonic caseation and neutrophilic aggregates were present in 56.3 and 72.9% of our cases, respectively, similar to that reported in other studies.^[19,20]

The Ziehl Neelsen stain for AFB of *M. tuberculosis* confirms the diagnosis in the presence of inflammatory exudates.^[7] AFB positivity is higher in untreated patients and HIV positive cases.^[21] AFB positivity was demonstrated in 47.9% of our patients including the HIV seropositive ones. None of our patients had prior anti-tuberculous therapy.

Early diagnosis of extrapulmonary tuberculosis can also be achieved with polymerase chain reaction (PCR) for the detection of mycobacterium DNA.^[7] This facility is however

Table 1: Age and sex distribution of patients

Age (years)	Male	Female	Total
0–10	6	1	7
11–20	3	3	6
21–30	10	9	19
31–40	6	3	9
41–50	5	1	6
51–60	1	0	1
Total	31	17	48

Table 2: Sites of aspiration and macroscopic features

Sites	Macroscopic features			Total (%)
	Caseation	Purulent	Blood stained	
Cervical node	2	15	14	31 (64.6)
Axillary node	3	0	2	5 (10.4)
Supraclavicular node	1	2	2	5 (10.4)
Submandibular node	0	2	0	2 (4.2)
Breast lump	1	3	0	4 (8.3)
Peri-umbilical mass	0	1	0	1 (2.1)
Total	7	23	18	48

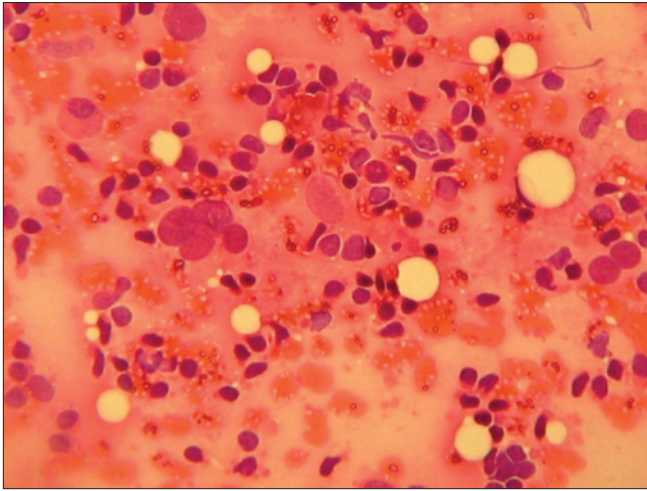


Figure 1: Smear shows epithelioid cells, plasma cell and giant cells $\times 100$

not readily available in most developing countries where the disease is prevalent, and where available, the cost is prohibitive to the patients.

It is advocated that in countries where tuberculosis is endemic, treatment can be instituted without the need for excisional biopsy if FNA results show eosinophilic granular material (caseation).^[22]

Early diagnosis of extrapulmonary tuberculosis in a resource-limited setting can be achieved with FNAC technique. This will ensure prompt treatment and thus reduce attendant morbidity and mortality.

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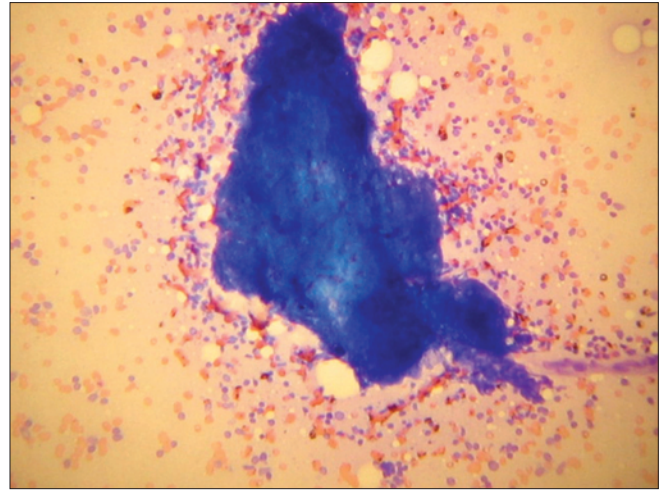


Figure 2: Smear shows caseous material and lympho-plasma cells $\times 40$

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