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Original Research Article

Spectrum of Lesions in Lymph Nodes- A Cytological Study

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ABSTRACT

Introduction: Lymph nodes are common sites of clinical presentation of many of the manifestations non-neoplastic and neoplastic diseases. Fine needle aspiration cytology (FNAC) a simple relatively non-invasive procedure which can be employed in diagnosis of superficial lesions of the body.
Aim: To study cytomorphological features of various lymph node lesions- non-neoplastic and neoplastic-by fine needle aspiration of enlarged lymph nodes.
Methods: The present prospective study to analyse the cytomorphological features of pathological lesions lymph nodes by FNAC is conducted over a period of one year. The study included all the patients of both sexes with age ranging from one to 70 years who presented with clinical features of lymphadenopathy.
Results: Out of a total 330 patients with lymphadenopathy subjected to FNAC, the most common site was cervical group of lymph nodes (74.24%) which showed female preponderance (62.42%).Cytomorphology was diagnostic of tuberculous lymphadenitis (32.12%), followed by reactive lymphadenitis(25.45%), granulomatous lymphadenitis (23.33%) and acute suppurative lymphadenitis(3.63%) and metastatic malignant lesions (3.33%) with lymphoproliferative lesions of undetermined significance (0.90%) while neoplastic lesions such as non-Hodgkin's lymphoma (0.30%).
Conclusion: FNAC is a simple, safe, reliable, and inexpensive method that could be employed in cytological study and early detection of inflammatory, reactive and neoplastic conditions leading to clinical lymphadenopathy.

Keywords: Fine Needle Aspiration Cytology (FNAC), Lymphadenopathy, reactive lymphadenitis, metastatic lesions, tuberculous lymphadenitis.

INTRODUCTION

Lymph nodes are an integral component of the immune system and are affected by a multitude of pathological lesions which manifest most commonly as lymphadenopathy in clinical practice. Lymph nodes are local circumscribed collections of lymphoreticular tissue invested by a fibrous capsule and located at anatomically generally invariable points along the course of lymphatic. Depending on the locations draining particular topographic regions, they are grouped as cervical, axillary, mediastinal,

retroperitoneal, iliac and inguinal lymph nodes and so on. [1] Rapid strides in the technical advancement of Fine needle aspiration cytology(FNAC) has made it very easier to diagnose most of the lesions of lymph nodes has reduced otherwise time-consuming and invasive open biopsy of lymph nodes. Fine Needle Aspiration Cytology is a simple procedure which is safe, rapid and inexpensive and relatively less invasive method, which could be carried out as an out-patient procedure without anaesthesia for establishing diagnosis of pathological lesions occurring in lymph nodes on the exposed, easily accessible regions of the body. [2, 3] In cases of lymphadenopathy, FNAC when employed along with guidance of other ancillary diagnostic aids is very helpful in rapid diagnosis of certain pathological conditions such as reactive lymphadenitis, tuberculous lymphadenitis, metastatic neoplastic lesions and lymphoproliferative conditions including most of the lymphomas with near relative precision. [3-5]

Aims and Objectives

The main aims and objectives of the present prospective study are to diagnose clinical lesions of lymph nodes by employing fine needle aspiration cytology of lymph nodes and study cytomorphological features of various pathological lesions of lymph nodes- non-neoplastic and neoplastic-on fine needle aspiration of lymph nodes and characterise them into various categories of clinical diagnostic entities such as into inflammatory, reactive and various neoplastic and lymphoproliferative lesions.

MATERIALS AND METHODS

The current prospective study was carried out in the Department of Pathology of a tertiary care teaching hospital in Navi Mumbai. The duration of study was one year between January 2017 to December 2017 and during which a total 225 cases of lymphadenopathy were evaluated by fine needle aspiration cytology (FNAC).

Fine needle aspiration cytology was conducted by using 10 ml disposable syringes connected with 22 to 24 bore hypodermic needles and aspirating cytological material from lesions of lymphadenopathy.

The cytological smears prepared from the aspirate were stained with standard cytological stains.

Special stains such as modified Ziehl-Neelsen stain, PAS and Grocott's Methenamine silver were used wherever necessary.

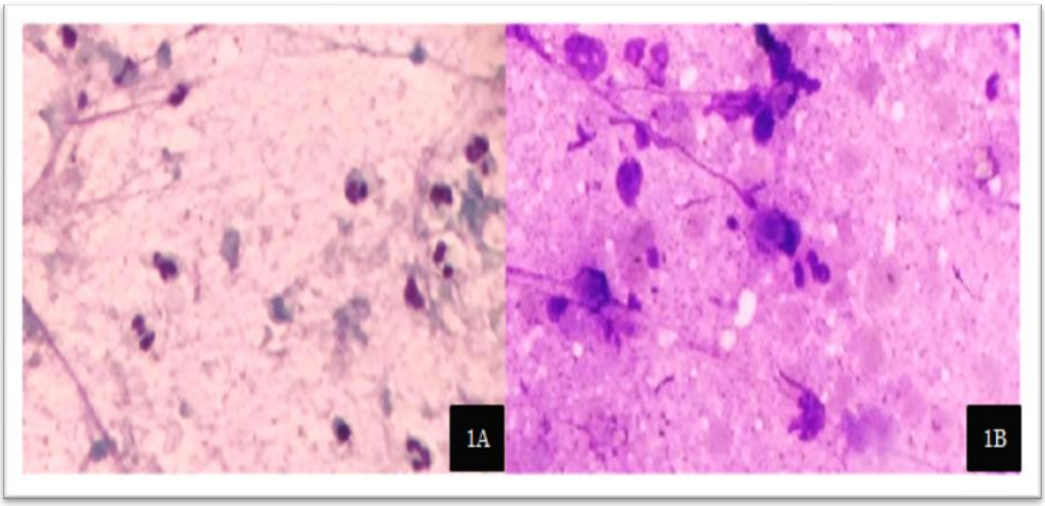

FIG 1A AND 1B – FNAC Smears from lymph node shows plenty of degenerated neutrophils and granular debris (Papanicolaou stain;1A.10X; 1B. 40X)

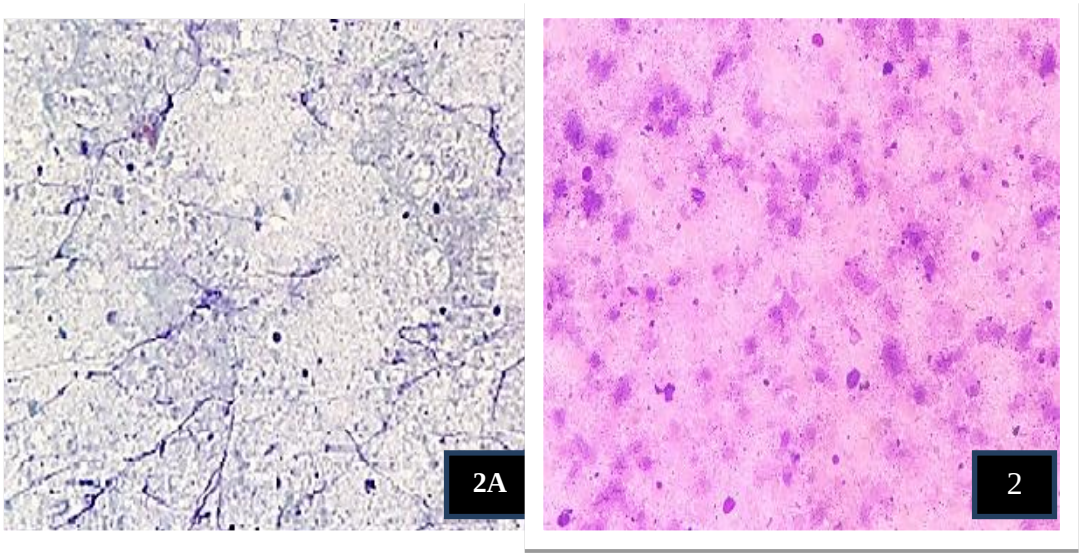

FIGURE 2A AND 2B- FNAC Smears show caseous necrosis (2a: 40X, Papanicolaou stain; 2b: 40X MGG stain;)

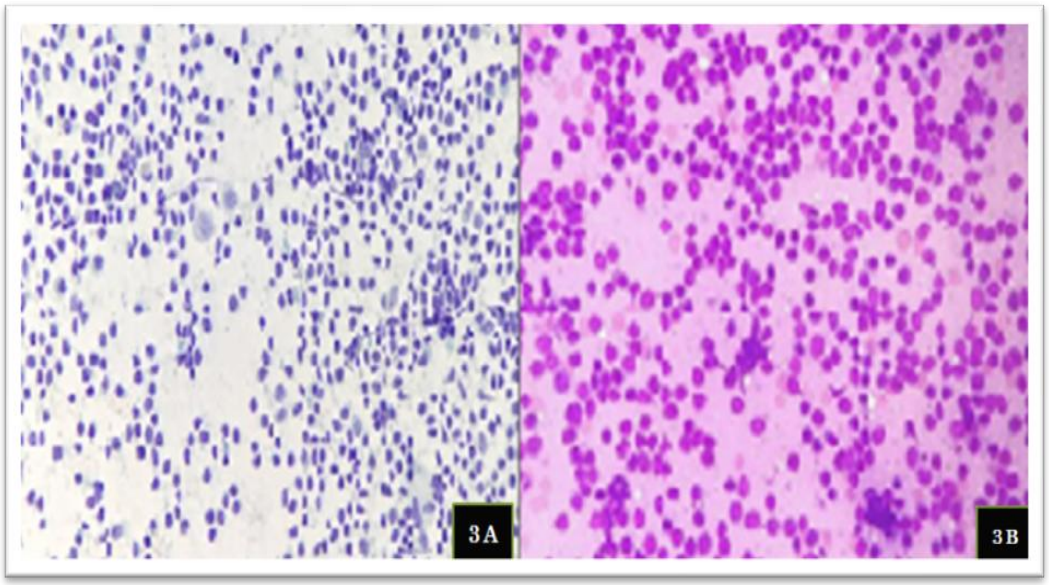

FIG 3A AND 3B. FNAC smear shows polymorphous population of lymphocytes in reactive lymphadenitis (3A. Papanicolaou stain; 3B. MGG stain-10X)

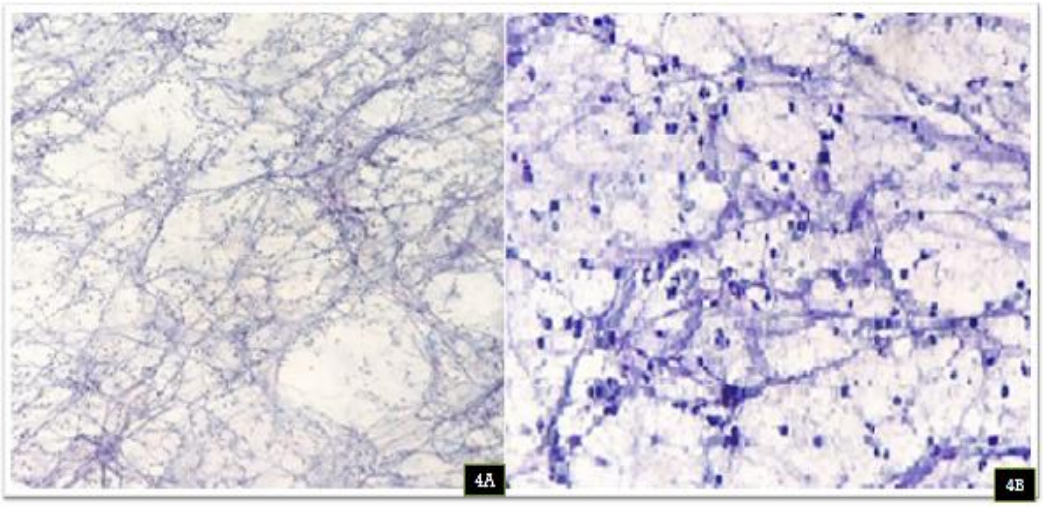

FIGURE 4A AND 4B FNAC smears show plenty of neutrophils on a background of caseous necrosis in tuberculous abscess (Papanicolaou stain; 4A: 10X; 4B: 40X)

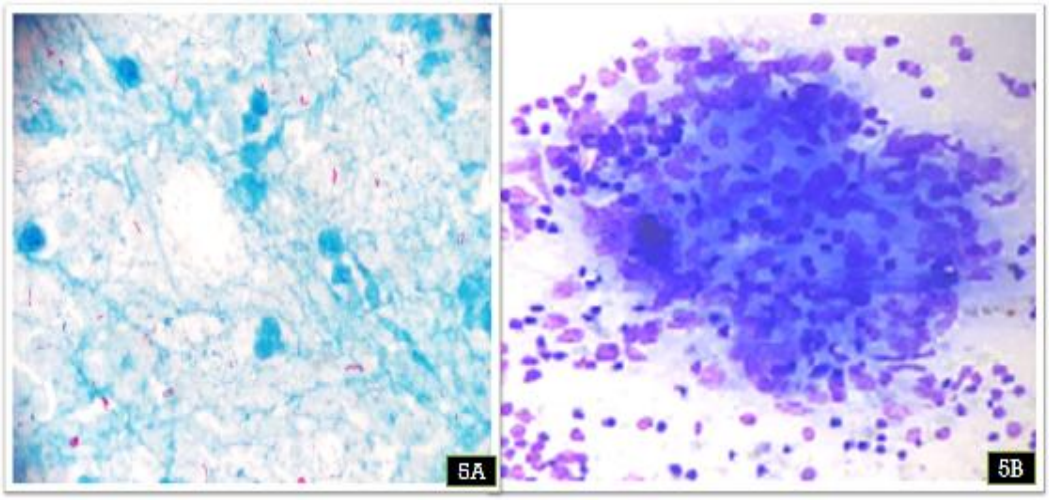

FIGURE 5A. Smear stained with Ziehl-Neelsen stain shows acid fast bacilli; FIGURE 5B. FNAC smear shows aggregates of epithelioid cells reminiscent of well-formed epithelioid granuloma. (MGG stain; 40X)

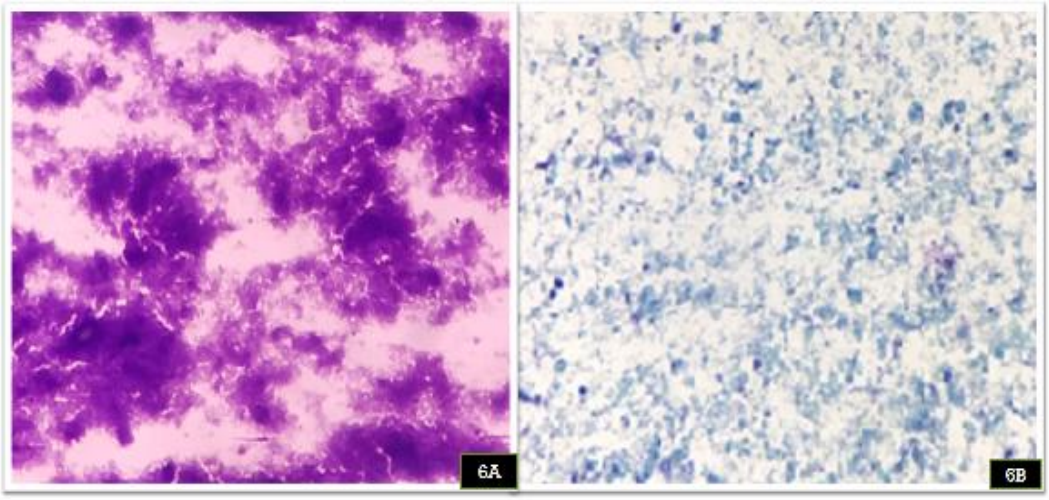

FIG 6A AND 6B: FNAC smears show only necrosis in necrotising lymphadenitis (MGG and Papanicolaou stain; 5A: 40X; 5B:40X)

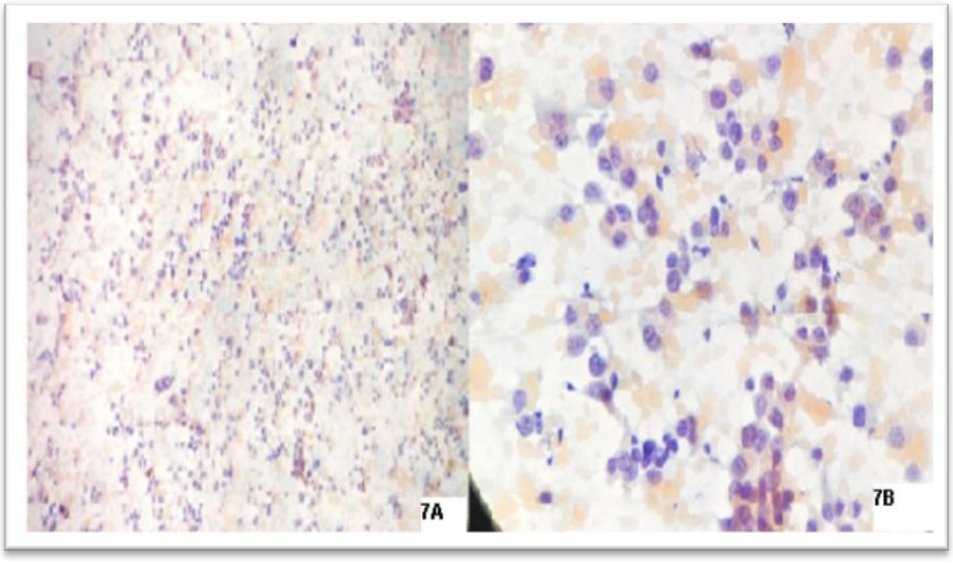

FIGURE 7A AND 7B: Metastasis in lymphanode (Papanicolaou stain; 6: 10 x:40X)

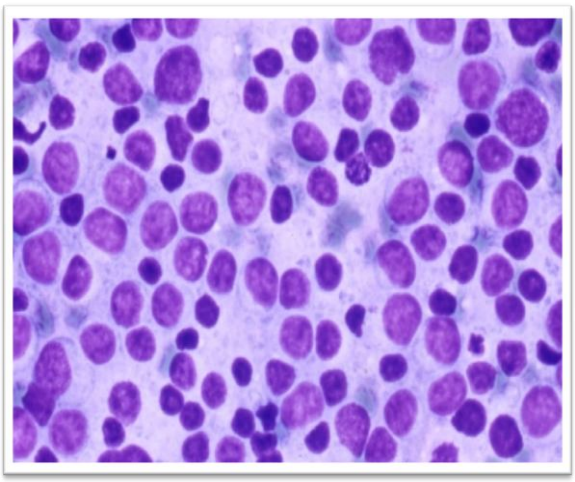

FIGURE 8. Non-Hodgkin's lymphoma (Papanicolaou stain; 40X)

RESULTS

During the present prospective study a total number of 330 patients various assorted case of lymphadenopathy were studied. Among them, 206 (62.42%) patients were female and 124 (37.57%) were male patients (Table 2). The age of the patients ranged from 1 year to 75 years (Table 1). Cervical lymph nodes were the most commonly affected group of lymph nodes amounting to in 245 of 330 cases (74.24%) followed by supraclavicular lymph nodes in 42 cases (12.72%), submandibular lymph nodes in 17 cases (5.15%), inguinal group of lymph nodes in 10 cases (3.03%), axillary and submental group of lymph nodes in 9 cases (2.72%) and 7 cases (2.12%) respectively (Table 4). Seven cases had inadequate material and were thus unsatisfactory for opinion. The most frequent cause of lymphadenopathy was found to be Tuberculous Lymphadenitis with 106 cases (32.12%). The next frequent diagnosis was Reactive with 84 cases (25.45%) followed by granulomatous lymphadenitis in 77 cases (23.33%) and metastatic lymphadenopathy in 11cases (3.33%). Acute suppurative lymphadenitis was seen in 12 cases (3.63%) and one case (0.30%) (Table 3).

TABLE 1. AGE WISE DISTRIBUTION OF THE CASES

Age group (years)	Number of cases	Percentage (%)
0-10	23	6.96%
11-20	52	15.75
21-30	121	36.66
31-40	70	21.21
41-50	31	9.39
51-60	13	3.93
61-70	18	5.45
71-80	02	0.60

TABLE 2. GENDER DISTRIBUTION OF THE CASES

GENDER	NUMBER OF CASES	PERCENTAGE(%)
MALE	124	37.57
FEMALE	206	62.42

TABLE 3. CYTOLOGICAL DIAGNOSES OF LYMPHNODE LESIONS

DIAGNOSIS	Number of cases	Percentage(%)
REACTIVE LYMPHADENITIS	84	25.45
GRANULOMATOUS LYMPHADENITIS	77	23.33
TUBERCULOUS LYMPHADENITIS	106	32.12
CHRONIC NON SPECIFIC LYMPHADENITIS	29	8.78
METASTATIC LYMPHADENOPATHY	11	3.33
MALIGNANT LYMPHOMA	01	0.30
ACUTE SUPPURATIVE LYMPHADENITIS	12	3.63
INADEQUATE	07	2.12
LYMPHOPROLIFERATIVE	03	0.90

TABLE 4. SITES OF LYMPHNODE INVOLVEMENT

SITE	Number of cases	Percentage (%)
CERVICAL	245	74.24
SUPRACLAVICULAR	42	12.72
SUBMANDIBULAR	17	5.15
AXILLARY	09	2.72
SUBMENTAL	07	2.12
INGUINAL	10	3.03

DISCUSSION

Both symptomatic and asymptomatic inflammatory processes are invariably found to be the most common causes of peripheral lymphadenopathy. [1] Fine Needle Aspiration Cytology (FNAC) is a study of cellular aspirate obtained through a fine needle under a negative pressure. FNAC is simple, safe, reliable, rapid and inexpensive method of establishing the diagnosis of lesion and Masses in various sites and organs.

In the present study, out of 330 cases, maximum cases were recorded between the age group of 21 years to 30

years which is comparable with study carried out by Smita P. Bhide et al [2] where maximum cases where recorded in the age group of 11-30 years.

The most common group of lymph node involved are cervical region lymph nodes (74.24%) which compares fairly with the findings of the study done by Uma et al [6-11] where the cervical node involved in 62.9% cases.

In countries like India, part of a large group of developing countries, tuberculosis, acute upper respiratory tract infections and suppurative lymphadenitis are the common causes of lymphadenopathy. [1] The present study shows that bulk of diseases affecting lymph nodes were of tuberculous etiology followed by reactive lymphadenopathy. Tuberculosis accounted for 106 cases out of 330 (32.12%) cases. The second most common cause of lymphadenopathy accounted for 25.45% (84 cases) of total 330 cases which is similar to the findings of a study conducted by Gayatri et al [6] where 26.2% cases amounted for reactive lymphadenitis.

In the present study, out of 330 patients, 124(37.67%) were males and 206 (62.42%) were females with the incidence of lymphadenopathy of all causes showing a female preponderance, a finding which compares favourably with study conducted by SmitaP. Bhide et al. [2]

TABLE 5. COMPARISON OF PRESENT STUDY WITH OTHER STUDIES

Authors	Reactive lymphadenitis	Tuberculous lymphadenitis	Metastatic lymphadenitis	Granulomatous lymphadenitis	Lymphoma
Present	25.45%	32.12%	3.33%	23.33%	0.33%
Patil R k [5]	37.2%	40.6%	16.4%	--	0.4%
Gayatri et al [6]	26.2%	14.5%	21.32%	14.7%	0.17%
Smita et al [2]	42.48%	44.25%	30%	7.97%	4.17%
Uma [7]	47.3%	28.54%	3.52%	7.21%	1.55%

TABLE 6. COMPARISON OF PRESENT STUDY WITH OTHER STUDIES

	Cervical Lymph node	Supraclavicular Lymph node	Axillary Lymph node	Inguinal Lymph node
Present	74.24%	12.72%	2.72%	3.13%
Uma et al [7]	62.9%	2.22%	18.5%	8.88%
Shilpa et al [8]	39.37%	6.25%	5%	3.12%
Shruti [1]	50.80%	12.30%	10%	10%

CONCLUSION

In the present prospective study tuberculous lymphadenitis is found to be the most common cause of lymphadenitis in India, while reactive lymphadenitis is the second most common cause of lymphadenopathy. Cervical group of lymph nodes are most commonly affected lymph nodes in most of pathological lesions, followed by supraclavicular lymph nodes. Axillary group of lymph nodes are least affected group of lymph nodes in the present study. The incidence of lymphoproliferative lesions as could be diagnosed on fine needle aspiration cytology (FNAC) in the present study is very low.

Lastly, fine needle aspiration cytology (FNAC) is the most simple, convenient and relatively quick minimally invasive and cost-effective out-patient procedure with minimal significant complications, which could be employed as first line of clinical investigation in the ideal setting of evolving health care facilities of developing countries to establish a conclusive diagnosis in most cases of lymphadenopathy.

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