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Original Article

Cytomorphological evaluation of enlarged lymph nodes: A tertiary hospital-based study

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Abstract

Introduction

Lymphadenopathy is one of the commonly encountered clinical presentations and early targets for aspiration; therefore, it provides an important clue toward the diagnosis of the underlying etiology.

Patients and materials

The present study was conducted in a tertiary care hospital in North India among 201 patients who underwent fine-needle aspiration cytology (FNAC) after gaining their informed consent.

Results

In the study, most patients were males (52.73%), with a male-to-female ratio of 1.1:1. The age group ranged from 1 to more than 80 years, with most patients in the age group of 21–30 years followed by 0–10 years and the least in more than 80 years. Of 201 patients, nonneoplastic cases were 121, neoplastic cases were 66, and inadequate were 13.

Discussion

Fine-needle aspiration cytology of enlarged lymph nodes yields an important diagnostic clue to arrive at the final diagnosis.

Keywords: Fine-needle aspiration cytology, lymphadenopathy, neoplastic, nonneoplastic

Introduction

Lymph node is one of the major anatomic components of the immune system [1]. One of the commonly encountered clinical presentation is lymphadenopathy (LAP), which in turn has multiple causes. LAP is defined as an abnormality in size and character of lymph nodes, caused by invasion or propagation of either inflammatory or neoplastic cells into the nodes [2]. Enlarged lymph nodes are an easy target for fine-needle aspiration (FNA), which in turn provides an important diagnostic clue to the underlying etiology. Various lesions of lymph nodes that are diagnosed by FNA include nonneoplastic lesions (reactive LAP, granulomatous lymphadenitis like tuberculosis, and sarcoidosis), neoplastic lesions (lymphoma, such as non-Hodgkin's lymphoma and Hodgkin's lymphoma, and metastatic deposits) and other rare lesions like sinus histiocytosis, silicon adenopathy, dermatopathic LAP, benign epithelial inclusions, and toxoplasmosis [3].

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Tuberculosis is the commonest cause of LAP in developing countries like India and should be considered in every case of granulomatous LAP unless proven otherwise [4]. Being the simplest, least-invasive, and cost-effective method, FNA is used as a triage to distinguish between the causes of LAP with a high or low level of suspicion of significant disease. As FNA is a simple, safe, quick, and minimally invasive procedure, it also reduces the need of surgical intervention in individuals who are not fit for surgery.

The use of fine-needle aspiration cytology (FNAC) in the diagnosis of LAP has become an acceptable and widely practiced minimally invasive procedure, which is safe, rapid, relatively pain free, and highly cost effective as well as

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accurate. Furthermore, the aspirated sample can be used for additional studies such as immunomarkers and histochemical studies [5].

The present study was conducted with the aim to study the different cytomorphological features associated with carious LAPs and also to study the utility of FNAC in diagnosing the cause of LAPs.

Patients and Methods

This is a prospective study, in which 201 patients were included. Ethical committee approval was taken. After explaining the procedure and obtaining an informed consent from the patient, FNAC of lymph nodes was performed. Patients were placed in a comfortable position in a couch depending on the location of the lesion, and lymph nodes were examined and palpated properly. The size of the swelling ranged from 0.1 cm to a few cm. A few were single, a few were multiple, and a few were matted as well. Under all aseptic precautions, a 23-G needle was introduced into the mass lesions, and aspirates were obtained by to-and-fro movement of the needle within the lesion. Smears were made immediately from the aspirate and stained by Giemsa and Papanicolaou (PAP) stains, using standard methods. Records of all the patients were reviewed for pertinent clinical history, and details of other investigations were noted. Relevant clinical history and details were noted and correlated accordingly.

Results

A total of 201 cases were included in our study. Of these, 106 (52.73%) were males and 95 (47.26%) were females, with a male: female ratio of 1.1: 1, as depicted in Table 1.

The age group ranged from 1 to more than 80 years. Of these, majority of the patients were in the age group of 21–30 years followed by the age group of 0–10 years, whereas the least were in the age of more than 80 years. Among the male patients, majority were in the age group of 0–10 followed by 51–60 years, whereas majority of the female patients were in the age group of 21–30 years followed by 31–40 years (Table 1).

Some of the lymph nodes were single, some were multiple, whereas others were matted, and the size of the lesions ranged from 0.1 cm to few cm. The cervical lymph node was the most common site involved in the study (n = 127) followed by the supraclavicular lymph node, whereas suprasternal was the least involved lymph node (Table 2).

Of 201 cases, nonneoplastic cases were 121, neoplastic were 67, and inadequate smears were 13 (Table 3). Of 121 nonneoplastic cases, 58 were reported as reactive lymphadenitis, 30 cases were of tubercular lymphadenitis, 26 were of granulomatous lymphadenitis, and seven cases were of abscess (Table 4). Of 67 neoplastic cases, 50 were metastatic, 16 were non-Hodgkin's lymphoma, and one was Hodgkin's lymphoma (Table 5 and Figs. 1–4).

Table 1: Depicting age and sex-wise distribution of lymph node lesions

Age (years)	Male	Female	Total
0-10	24	10	34
11-20	15	12	27
21-30	17	27	44
31-40	07	21	28
41-50	07	07	14
51-60	22	10	32
61-70	10	05	15
71-80	03	03	06
>80	01	00	01
Total	106	95	201

Table 2: Depicting the sites of lymph node aspirated

Site	Male	Female	Total
Supraclavicular	17	20	37
Submandibular	02	05	07
Cervical	70	57	127
Inguinal	11	02	13
Suprasternal	01	00	01
Axillary	03	09	12
Preauricular	02	02	04
Total	106	95	201

Table 3: Depicting the distribution of lymph node lesions

Type of lesion	Male	Female	Total
Nonneoplastic	51	70	121
Neoplastic	45	22	67
Inadequate	10	03	13
Total	106	95	201

Table 4: Depicting the distribution of nonneoplastic lesions

Type of nonneoplastic lesion	Male	Female	Total
Tubercular lymphadenitis	10	20	30
Granulomatous lymphadenitis	08	18	26
Reactive lymph node	33	25	58
Abscess	00	07	07
Total	51	70	121

Discussion

The present study included 201 cases presenting with LAP who underwent FNAC. Of 201 cases, 106 were male and 95 were females, with a male: female ratio of 1.1:1. The results were in accordance with the study by Suri *et al*. [2]. Moreover, the study conducted by Patra *et al*. [6] and Sarda *et al*. [7] showed similar results.

In our study, most cases were in the age group of 21–30 years. The results were similar to the studies by Bhida *et al*. [14], Ullah *et al*. [8], and Chawla *et al* [9].

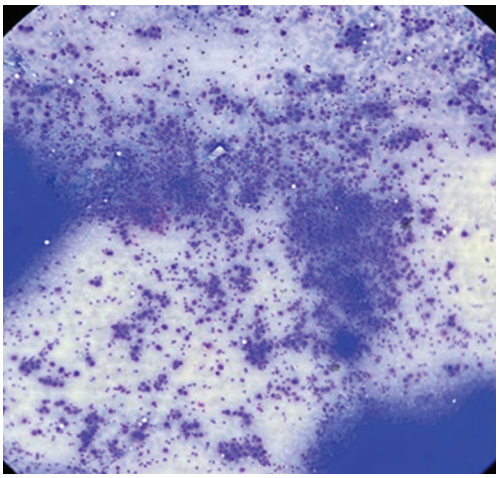

Figure 1: FNA smears of metastatic deposits of malignant melanoma in a lymph node. FNA, fine-needle aspiration.

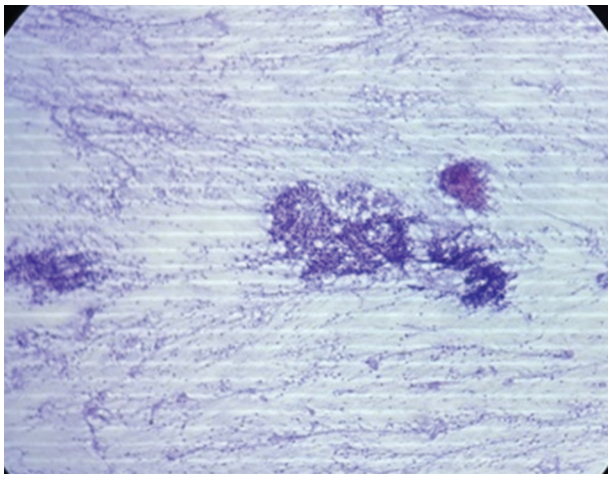

Figure 2: FNA smears of tubercular lymphadenitis showing caseous necrosis and granulomas. FNA, fine-needle aspiration.

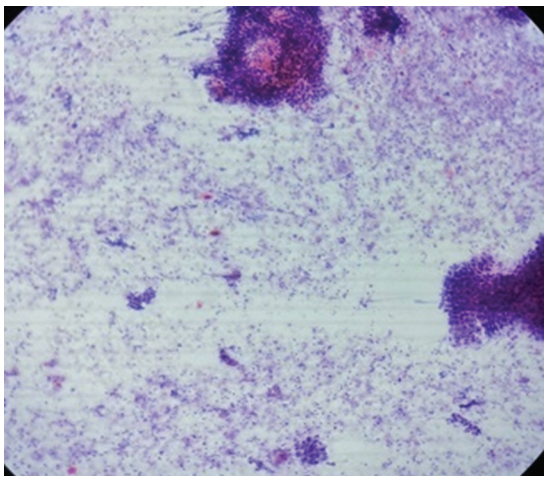

Figure 3: FNA smears of metastatic deposits of squamous cell carcinoma to lymph node. FNA, fine-needle aspiration.

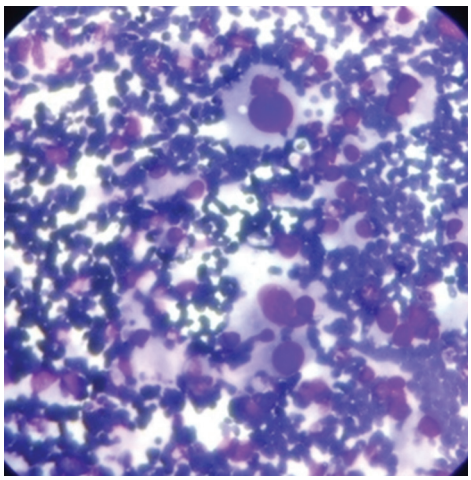

Figure 4: FNA smears of metastatic deposits of poorly differentiated carcinoma to a lymph node. FNA, fine-needle aspiration.

Table 5: Depicting the distribution of neoplastic lesions

Type of neoplastic lesion	Male	Female	Total
Hodgkin's lymphoma	00	01	01
Non-Hodgkin's lymphoma	10	06	16
Metastatic deposits			
Poorly differentiated carcinoma	09	06	15
Adenocarcinoma	05	04	09
Squamous cell carcinoma	20	03	23
Plasmacytoma	00	01	01
Anaplastic carcinoma	01	00	01
Malignant melanoma	00	01	01
Total	45	22	67

Among the 201 cases in our study, 60.19% (n = 121) were nonneoplastic and 33.33% were neoplastic. Similar results were reported by the studies by Ahmed *et al*. [10] and Mohammad and Azadeh [11].

In our study, among the neoplastic lesions, metastatic deposits were most common (n = 50) followed by non-Hodgkin's lymphoma (n = 16) and Hodgkin's lymphoma (n = 1). The results were comparable to the findings of Jha *et al*. [12] and Arora and Arora [13].

In our study, reactive lymphadenitis was the most common nonneoplastic lesion (n = 58) followed by tubercular lymphadenitis and granulomatous lymphadenitis. The results were in accordance with the study by Bhida and colleagues.

Conclusion

FNAC remains the safe and gold standard investigation for arriving at the final diagnosis. It is a simple, easy, and reliable diagnostic tool that fills the gap between clinical evaluation and final pathological diagnosis.

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Conflicts of interest

There are no conflicts of interest.

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