

Evaluation of Fine Needle Aspiration Cytology of Cervical Lymphadenopathies at Tertiary Care Center

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ABSTRACT

Background: Lymphadenopathies in the neck region is the most frequently sent for the cytology evaluation from the clinicians, involvement in regional and systemic diseases and their easy accessibility make the FNAC as a primary workup. Inflammatory and immune reactions are the most frequent causes of lymph node enlargement and are self limiting in majority of cases. Tuberculosis can also be diagnosed by cytology of affected lymph nodes. With the advent of FNAC, most of the inflammatory, reactive and neoplastic conditions can be diagnosed without biopsy. It has the advantage that it can be done safely, rapidly and cheaply with minimal trauma at an outpatient setup or at the bedside.

Methods: This study was conducted at cytology section of pathology department of our institute. Patients from ENT, Surgery, Medicine, Pulmonary medicine departments were referred for FNAC. Written informed consent was obtained from all patients. It included patients with lymphadenopathies in cervical region. FNAC was conducted with the help of a 24 gauge disposable needle attached to a 10cc syringe. Smears were fixed in methanol and stained with Haematoxylin and Eosin as well as Papanicolaou stains. MGG stain was done on air dried smears. The results expressed as percentage were tabulated.

Result: Maximum numbers of patients were diagnosed with Reactive Lymphadenopathy 67/266 (25%), followed by Chronic Granulomatous Inflammation 59/266 (22 %), Metastatic 52/266(20%), Acute Suppurative 37/266 (14%), Tuberculous 27/266 (10%), Non Specific 14/266 (5 %), Lymphoma (primary) 8/266 (3%) and miscellaneous 2/266 (1%) consists Sinus Histiocytosis & Kawashaki disease. Histopathological correlation was available in 25/266 cases.

Conclusion: FNAC is a safe, simple & inexpensive primary immediate diagnostic procedure and workup for lymph node enlargements, especially in cervical lymphadenopathies where biopsies are not done routinely.

Keywords: Cytology, Cervical Lymph Nodes, Metastatic Malignancies

Introduction

Cervical lymphadenopathy is commonest clinical presentations of patients, attending the outdoor clinics in most hospitals. The etiology varies from an inflammatory cause to a malignant condition [1,3]. Fine needle aspiration cytology (FNAC) of lymph node has become the initial workup in diagnosis and management of patients with lymphadenopathy due to early availability of results, simplicity and minimal trauma with less complication [4]. FNAC has also been advocated as a useful method in comparison to more expensive surgical excision biopsies in developing countries with limited financial and health care resources [5]. It almost offers an accurate diagnosis for infectious disease, granulomatous lymphadenitis, reactive lymphoid hyperplasia and metastatic malignancy. Thus, it can avoid the need for excision biopsy in most cases and allow rapid onset of therapy [6]. The diagnosis of metastatic tumor to the lymph node on cytological smear is crucial and highly reliable. This would be the sole indication for searching the primary tumor, especially in cases of occult

carcinoma [7]. However, in most of these cases, the primary tumor is clinically known and FNAC is used widely for the follow up of these patients. Most of metastatic carcinoma can be identified by their cytomorphological characteristics alone. However, there are some instances where features of different tumors overlap and the precise diagnosis of the primary tumor remains obscure [8]. Ancillary techniques, such as immunocytochemistry, are used to overcome these difficulties and support the cytodiagnostic interpretation [9].

FNAC is used mainly to assess the staging of primary lymphoid malignancies as well as to recognize the residual and recurrent lymphoid malignancies [10]. Shakya et al. [11] also mentioned that the cytology is more readily accepted for the evaluation of deeply seated lymph nodes (i.e. surgically inaccessible) with primary lymphoma or for medically unfit patients for surgery. However, the role of FNAC for the initial diagnosis and subclassification of primary lymphoid malignancy is still controversial

and the cytological diagnosis of lymphoma on FNAC is still very often followed by tissue biopsy in most cases [12]. Since the latest World Health Organization (WHO) lymphoma classification is based not only on the architectural pattern, but also on cellular morphology, phenotype, and genotype of malignant lymphoid cells; and all of which can be assessed on cytology. Therefore, FNAC in combination with immunophenotypic and genotypic studies is gaining respect in providing an accurate diagnosis of malignant lymphoma in selected risk patients [13]. Cervical lymph nodes are involved most often in all types of lymphadenopathy particularly reactive hyperplasia and Hodgkin lymphoma [11]. Although the reliability of FNAC of cervical lymph node has been shown in some studies [14,15] but there are also some reports in contrary [16,17].

Materials and Methods

This retrospective study on 266 selected patients with cervical lymphadenopathy was conducted at the Cytology section, Pathology Department of our institute from January 2015 to December 2015. Cervical nodal enlargement was the clinical manifestation of the patients in all cases. In this study is of FNAC from the enlarged cervical lymph nodes done, which were stained with Hematoxylin and Eosin as well as Papanicolaou stains. MGG stain was done on air dried smears. In each studied case, a brief clinical history was considered including age, sex, size and site of enlarged cervical nodes. The cytology smears of all cases were examined to determine the cytomorphological features. These features included material adequacy, cellular populations, cell arrangement and nuclear as well as cytoplasmic features. The background was noted for the presence of necrosis and granuloma formation as well as for the type of inflammatory cells.

Paucicellular smears were excluded from the present study. The cytology results included four main diagnoses; (a) “benign diagnosis with recommendation of follow up” that deal with smears presenting no malignant tumor cells. (b) “Malignant metastatic diagnosis with recommendation of searching for the primary tumors” that comprised smears showing malignant metastatic tumor cells. (c) “Malignant primary lymphoma (non Hodgkin lymphoma, large cell type or Hodgkin lymphoma) with recommendation of excision for confirmation and immunophenotyping” that showed large malignant-looking lymphoid cells or typical Reed–Sternberg (R–S) cells. (d) “Suggestive of or suspicious for lymphoid malignancy with a recommendation of biopsy and

immunophenotyping” that revealed atypical small or large lymphoid cells or revealed R–S and Hodgkin-like cells. In the current study, we considered suggestive or suspicious cases as positive for malignancy as all these cases were investigated and managed seriously.

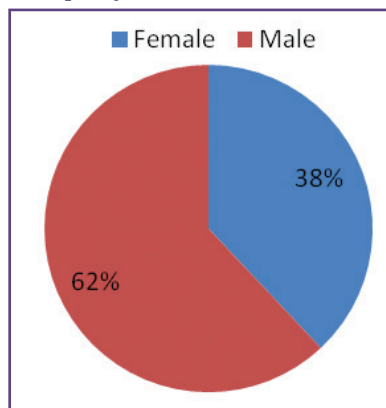
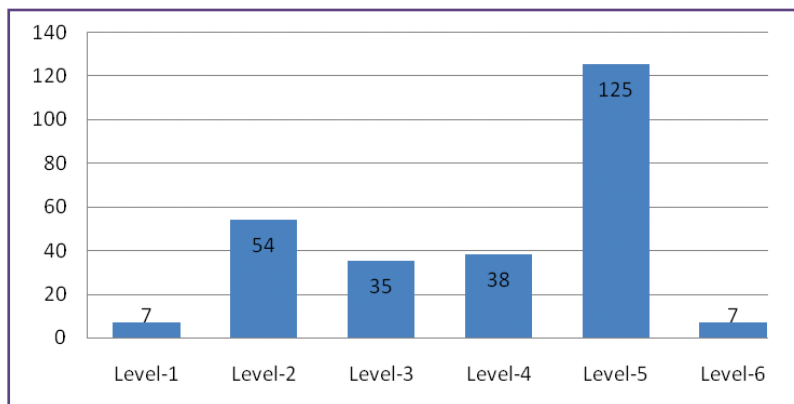
The histopathological assessment was advocated in the included cytologically benign cases either due to clinical persistent, multiple, or enlarging lymphadenopathy or due to suspicious radiological or laboratory features. The histopathological examination was performed in the included malignant metastatic cases as the metastatic work up of such cases failed to identify the primary tumors. The cytopathological diagnoses then were compared with the histopathological results of the same excised nodes. In cases of discrepancy, histopathologic results were considered the gold standard.

Result

Among the 266 studied FNAC cases with cervical lymphadenopathy, 101 (38%) cases were females and 165 (62%) cases were males with male: female ratio of about 1:1.6 (Chart 1). In lymph node of cervical region Level-5 i.e. from posterior triangle involved most frequently (Table-2). The age wise distribution is given in (Table-3) in which high occurrence of reactive lymphadenitis in first decade, chronic granulomatous inflammation in third decade and malignancy in sixth decade noted. The cytological diagnoses were found to be benign in 206(76.7%) cases and malignant in 62(23.3%) cases (Table-3). Among the benign cases occurrence of reactive lymphadenitis 67 (25%), chronic granulomatous lymphadenitis 59 (22%), acute suppurative inflammation 37 (14%), tuberculous lymphadenitis 27(10%) and chronic non-specific in 14 (5%) of cases noted. In malignant condition there is dominancy of metastatic squamous cell carcinoma found 23(8.6%) cases followed by metastatic adenocarcinoma 9 (3.4%), primary non-hodgkins lymphoma 8(3%) and metastatic lesion from unknown malignancy were 8 (3%) of cases and few miscellaneous cases given in (Table 3). The cytopathological results were then compared with the histopathological diagnoses of the corresponding excised lymph nodes. 25 cases of malignant lymphadenopathy diagnosed by cytology were consistent with histopathology.

Discussion

The lymphatic system is the important defense mechanism against the invading pathogens in the body through which diseases may not only be cleared away, but in case of malignant condition it plays conspicuous role

Chart-1: Sex distribution of cervical lymphadenopathy cases.**Chart-2: Level (Topographic distribution) of lymph nodes aspirated****Table-3: Cytological diagnosis of cervical lymphadenopathy with age distribution.**

Diagnosis	Age (years)	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total
Reactive lymphadenopathy		27	17	15	5	3	-	-	-	-	67
Granulomatous lymphadenopathy		5	9	27	8	3	6	-	-	1	59
Acute suppurative lymphadenopathy		7	4	8	7	5	5	-	1	-	37
Tuberculous lymphadenopathy		1	9	6	7	2	2	-	-	-	27
Metastatic squamous cell carcinoma		-	-	1	2	2	12	1	3	2	23
Chronic Non-specific lymphadenopathy		5	4	3	2	-	-	-	-	-	14
Metastatic adenocarcinoma		-	-	-	2	1	2	4	-	-	9
Primary lymphoma		1	1	-	2	3	-	1	-	-	8
Metastatic unknown origin		1	-	1	1	-	2	3	-	-	8
Metastatic neuroendocrine ca.		-	-	-	-	-	1	2	1	1	5
Metastatic ductal ca. breast		-	-	-	-	1	1	-	-	-	2
Dermatopathic lymphadenopathy		-	-	1	-	-	-	-	-	-	1
Kawasaki's lymphadenopathy		1	-	-	-	-	-	-	-	-	1
Metastatic epithelial malignancy		-	-	-	-	1	-	-	-	-	1
Metastatic malignant melanoma		-	-	-	-	1	-	-	-	-	1
Metastatic nasopharyngeal ca.		-	1	-	-	-	-	-	-	-	1
Metastatic thyroid malignancy		-	-	-	-	-	-	-	-	1	1
Rosai-dorfman sinus histiocytosis		1	-	-	-	-	-	-	-	-	1
Total		49	45	62	36	22	31	11	5	5	266

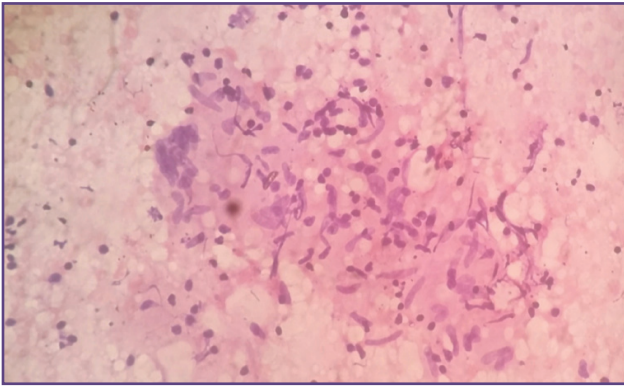


Fig. 1 H&E stained smear in high power field showing granuloma formation.

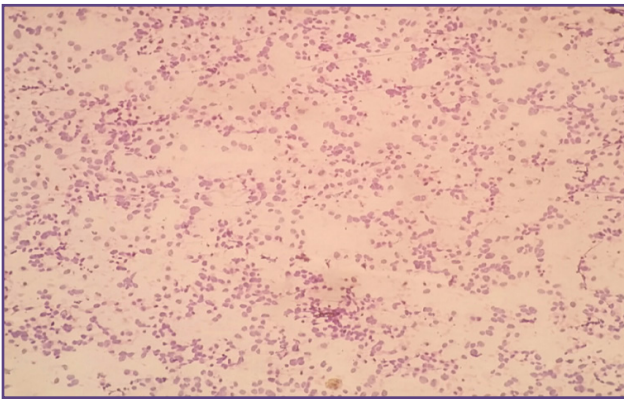


Fig. 2 H&E stained smear in low power view showing (diffuse large B-cells) Non-Hodgkins lymphoma.

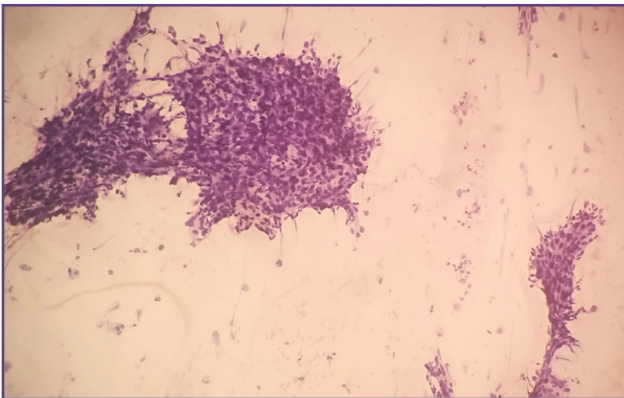


Fig. 3 H&E stained smear in low power view showing sheets of malignant squamous epithelial cells in metastatic squamous cell carcinoma.

in spreading to the remote organs in the body. Cervical lymphadenopathy is a commonly encountered clinical condition requiring early and reliable diagnosis so that a proper treatment protocol can be started as early as possible. FNAC is a safe, quick and cost effective method for rapid evaluation of lymphadenopathy, reducing need

of surgical biopsy. In the present study we evaluate 266 FNAC cases of cervical lymphadenopathy over a period of one year. The pattern of lesions varied from non-neoplastic lesions like tuberculous lymphadenopathy, reactive lymphadenopathy, acute suppurative lymphadenopathy, granulomatous lymphadenopathy, sinus histiocytosis and non-specific lymphadenopathy, to neoplastic lesions like metastatic lymphadenopathy and Lymphomas.

In our study, reactive lymphadenopathy was observed to be the most frequent diagnosis with 67/266 (25%) cases. It was also the most frequent diagnosis in other studies and its incidence has been seen to range from 18.9% to 42%.^[18, 19, 20] The second most frequent diagnosis in this study was observed to be chronic granulomatous inflammation with 59/266 (22%) cases (fig.1). The incidence of granulomatous inflammation was observed to vary from 9.2% to 25.45% in other studies.^[3, 20] Tuberculous lymphadenopathy diagnosed by cytology alone occurred in 27/266 (10%) of our cases. Acute suppurative lymphadenopathy was observed to be a frequent occurrence with 37/266 (14%) cases in our study. A study on tuberculous lymphadenitis done by Sarwar et al,^[21] found only necrosis without epithelioid granuloma in 35% cases. Surase et al^[7] in their study also found one of the cytological patterns of tuberculous lymphadenopathy to be only of necrotic material without epithelioid cells, or giant cells. In such cases Zeihl- Nielson's stain should be done to demonstrate Acid Fast Bacilli. Squamous Cell Carcinoma is known to be associated with necrosis. Finding only necrotic material on cytology without the evidence of malignant cells was noted in 2% cases, in a study conducted by Kiran Alam et al^[22] and 4.1% cases of the study by Bhagwan et al^[23]. The present study also comprised 14/266 (5%) cases diagnosed as non specific lymphadenopathy on cytology. This correlated somewhat with the study of Haque and Talukdar^[9] who found the incidence to be 2.63% of all lymph nodes aspirated. We diagnosed 59/266 (23%) neoplastic lesions in the lymph nodes by FNAC, of which more cases of metastatic involvement 51/59 (86.6%) rather than lymphoma 8/59 (13.3%) were seen (fig.2). This was similar to other Indian studies.^[19, 22] Other studies have found the incidence of neoplastic involvement to vary from 10.1% to 47.8%^[3, 24]. A Brazilian FNAC study on lymph nodes diagnosed 79.4% metastasis and 14.2% lymphomas.^[25] A study conducted in Egypt has reported more involvement by lymphomas (80.3%) rather than metastatic diseases (19.7%).^[1]

Histopathological correlation (25/59 cases) was 100% in all our cases of metastatic malignancies of lymph nodes. Since most of our patients initially diagnosed cases of lymphoma belonged to the lower socio economic group, they referred to higher centre for immunohistochemistry

when the patient could afford it. Most of the cases with the primary lymphoma either transferred to higher cancer institute or treatment defaulter. In our study the cervical group was the most common to be involved by metastasis and the primary was most often from the oral cavity, which was similar to other studies,^[3, 26] with squamous cell carcinoma (fig.3) being the most common histological type.^[2, 22, 23] Rates for oral cavity, pharynx, oesophagus and male larynx are highest in India, probably due to the use of multiple tobacco products. Metastases from the lung, breast malignancy often due to lack of awareness about the malignancy and poor treatment compliance due to lower socioeconomic condition and illiteracy with social stigma^[27]. Although we had a very low number of 25/266 cases (9.4%) with histopathological correlation, we could diagnose reactive lymphadenopathy, sinus histiocytosis, chronic granulomatous lesion suggestive of tuberculosis and malignant lesions with high accuracy. The low number of biopsies was probably due to the clinician's satisfaction with the cytological diagnosis and correlates with other non-invasive diagnostic ailments like radiological and microbiological investigations. Thus FNAC of the lymph nodes can be used as an effective and simple diagnostic tool for cervical lymph node lesions.

Conclusion

FNAC is an important primary diagnostic tool for benign and malignant cervical lymphadenopathy. It is a safe, simple and inexpensive definite diagnostic procedure to render a prompt diagnosis, especially in lymph node aspirates, where biopsies are not done commonly. The limitations are with necrotic lymphadenopathy, heterogeneous swelling with limited representative aspirates, where if the clinician is unsatisfied with the cytological diagnosis, further workup like biopsy is required in order to make a reliable diagnosis. FNA evaluation in patient with no previously diagnosed malignancy should be interpreted conveniently and guide towards the proper workup and management of the primary lesion.

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