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Original Research Article

Role of FNAC in the diagnosis of cervical lymphadenopathy

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ABSTRACT

Background: Cervical lymphadenopathy is one of the commonest presentations in inflammatory and neoplastic disorders. Fine Needle Aspiration Cytology (FNAC) is simple, quick, inexpensive and minimally invasive OPD technique used for establishing the etiology of cervical lymphadenopathy. In this study we describe cytomorphological patterns of cervical lymph nodes and its utility in establishing diagnosis. Objectives of present study were to assess the distribution of various cytomorphological patterns of cervical lymphadenopathy and to assess the age specific distribution of various cytomorphological patterns of cervical lymphadenopathy.
Methods: This study was carried out in the Department of Pathology, Andhra Medical College on 200 cases of cervical lymphadenopathy over a period of three months from August - October 2017. FNAC diagnosis was correlated with relevant clinical findings and investigations.
Results: Total 200 cases were studied. Of these, 170 (85%) were inflammatory and 30 (15%) were neoplastic. Reactive non-specific lymphadenitis was the most common disease found in 95 (47.5%) patients followed by tuberculous lymphadenitis in 60 patients (30%) and granulomatous lymphadenitis in 15 patients (7.5%). Among neoplastic lesions, metastatic tumours were reported in 26 patients (13%) and Lymphoproliferative disorder/Lymphoma was reported in 4 patients (2%). Highest incidence of cervical lymphadenopathy was found in patients of 10-39 years age group, among which most of the cases were non-specific lymphadenitis followed by tuberculous lymphadenitis. Amongst the neoplastic lesions, most of the cases were in the age group of 40-79 years.
Conclusions: FNAC is simple, safe, reliable procedure for diagnosis of cervical lymphadenopathy.

Keywords: Cervical Lymphadenopathy, Cytomorphology, FNAC

INTRODUCTION

Cervical lymphadenopathy often occurs in common in clinical practice. Cervical lymphadenopathy is usually defined as cervical node measuring more than 1 cm in diameter. It could be due to infection, autoimmune disease or malignancy.[1]

Based on the duration, cervical lymphadenopathy is further classified into acute lymphadenopathy (2 weeks duration), subacute lymphadenopathy (2-6 weeks duration), and chronic lymphadenopathy is considered in any lymphadenopathy that does not resolve by 6 weeks.[2]

Fine needle aspiration cytology is a cheap and accurate first line investigation in lymphadenopathy.[3] Because of early availability of results, simplicity, minimal trauma and complications, the aspiration cytology is now considered as a valuable diagnostic aid and it provides ease in following patients with known malignancy and ready identification of metastasis or recurrence.[4]

On-site evaluations can also lead to the appropriate triage for flow cytometry, microbiologic culture, and other ancillary studies.[5] The present study was carried out to know the overall prevalence of various diseases responsible for cervical lymphadenopathy.

METHODS

This is a prospective study carried out in the cytopathology section of Department of Pathology, Andhra Medical College. Data concerning cervical lymph node FNAC was retrieved over a period of 3 months from August-October 2017. A total of 200 patients with cervical lymphadenopathy were subjected to FNAC using 22gauge needle and a 10ml syringe. The slides were wet fixed and studied using Hematoxylin and Eosin staining.

Based on the cytomorphological patterns observed, the cases were categorized into the following groups:

- Non-specific reactive hyperplasia: Smears were cellular, showing a polymorphous population of lymphoid cells and histiocytes.
- Tuberculous lymphadenitis: Epithelioid granulomas with caseous necrosis and giant cells (AFB and CB NAAT positive- Cartridge Based Nucleic Acid Amplification Test)
- Granulomatous lymphadenitis: Epithelioid granulomas without caseous necrosis (AFB and CB NAAT negative)
- Metastatic malignancy: Malignant cells arranged in clusters or discretely along with other lymphoid cells. Metastatic carcinoma was subdivided according to cytological features.
- Lymphoproliferative disorders/Lymphomas: Hodgkins and Non Hodgkins.

RESULTS

In this study 200 patients were subjected to FNAC for cervical lymphadenopathy. There were 70 males and 130 females in the study. The male: female ratio in this study was 0.6:1, with a female preponderance. The age at presentation ranged from 2 years to 70 years. Maximum number of patients were in the 10- 39 years age group (128 cases, 64%) followed by the age group 40-59 years (39 cases, 29.5%), 0-9 years (25 cases, 12.5%) and the least in the 60-79 years age group (8 cases, 4%).

Of the 200 cases studied, inflammatory pathology was noted in 170 cases (85%) while neoplastic pathology was noted in 30 cases (15%). Non-specific reactive lymphoid hyperplasia was noted in 95 patients (47.5%). This was the most common presentation of cervical lymphadenopathy in the current study. This was followed by Tuberculous lymphadenitis which accounted for a total of 60 cases (30%). Granulomatous inflammation without caseous necrosis accounted for 15 cases (7.5%). Neoplastic pathology was observed in 30 cases (15%), of which metastatic malignancy was found in 26 cases (20 cases of squamous cell carcinoma and 6 cases of adenocarcinoma), 4cases of lymphoproliferative disorders that included 3 cases of Non- Hodgkins lymphoma and one case of Hodgkins lymphoma (Table 1). Table 2 summarizes the various cytomorphological patterns we encountered in our study on FNAC of cervical lymphadenopathy in comparison with other similar studies conducted previously.

Table 1: Summary of FNAC of cervical lymphadenopathy.

Age (years)	No. of cases	Non-specific	TB	Granulomatous	Lymphoproliferative disorder/Lymphoma	Secondaries
0-9	25	21	2	2		
10-19	47	24	20	3		
20-29	52	24	23	3	2	
30-39	28	16	6	2	1	3
40-49	19	5	5	3	1	5
50-59	20	4	4	2		10
60-69	6	1				5
70-79	3					3
Total	200	95	60	15	4	26

Table 2: Comparison of current study with other studies evaluating causes for cervical lymphadenopathy.

Author	Total cases	Reactive lymphadenitis	TB lymphadenitis	Malignancy (primary and metastatic)	Others
Current Study	200	95 (47.5%)	60 (30%)	30 (15%)	15 (7.5%)
Khuba R	50	10 (20%)	08 (16%)	03 (6%)	13 (26%)
Vapi et al	34	10 (29.4%)	08 (23.5%)	03 (8.8%)	13 (38.2%)
Tariq et al	100	18 (18%)	36 (36%)	14 (14%)	32 (32%)
Koo V et al	18	00	05 (27.8%)	06 (33.3%)	07 (38.9%)
Bai M	50	03 (6%)	31 (62%)	16 (32%)	00

DISCUSSION

Localized or regional lympadenopathy is defined as the enlargement of lymph nodes within contiguous anatomic regions. A round, firm, well-defined lymph node that is present for more than 8 weeks, or a lymph node that is fixed to the skin, deep anatomic planes, or other lymph nodes should be considered for FNA regardless of location, patient age, or symptoms. Viral, bacterial or mycobacterial infections are the most common causes of benign regional lymphadenopathy. The well-defined role of FNAC in the investigation of lymphadenopathy has previously been studied.[6] In the current study, 170 out of 200 cases (85%) were benign by nature whereas 30 cases (15%) had a malignant pathology. Among the benign causes of lymphadenopathy, the most common was non-specific reactive lymphadenopathy accounting for 95 cases (47.5%) followed by tuberculous lymphadenitis (60 cases, 30%).

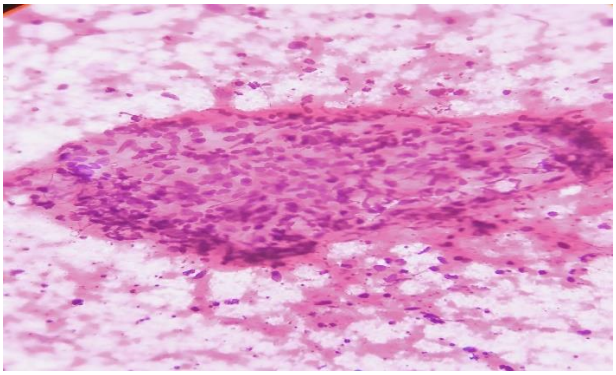

Figure 1: Microphotograph of tuberculous lymphadenitis showing a sheet of macrophages and epithelioid cells against lymphocytic background showing caseous necrosis (400X H&E).

The high incidence of TB in the study may be due to the endemicity of the disease in India. Moreover, the most common form of extrapulmonary tuberculosis is tuberculous lymphadenitis with cervical lymph nodes being the most commonly involved group. In a study of 1396 cases of FNAC of cervical lymphadenopathy, Ramesh kumar found the most common benign lesion to be tuberculosis (54%).[7]

Bezabih et al found FNAC reliable in helping to avert more invasive surgical procedures undertaken in the diagnosis of tuberculous adenitis. They suggested adding Ziehl Neelsen stain for identification of acid-fast bacilli as an adjunct to increase the diagnostic accuracy of tuberculous lymphadenitis.[8] In the study of Tariq et al in 2008 tuberculous lymphadenitis was found to be the most common pathology of cervical lymph node lesions (Figure 1).[9]

AFB positivity is maximum in cases showing caseous necrosis with occasional epithelioid cells. The presence of acid-fast bacilli in smears is directly proportional to the necrosis and inversely to the granulomas. Sometimes in absence of AFB positivity the diagnosis of highly suspicious of tuberculosis was given in these lesions with strong clinical suspicion, high ESR and chest X-ray findings.

The most common cause of cervical lymphadenopathy in the present study was due to reactive hyperplasia. This was found to be common in younger age groups i.e. less than 40 years. Since infections from oral cavity, ears, nose, and para nasal sinuses drain into these nodes, reactive lymphoid hyperplasia is a common finding.[10] Etiology is diverse and more often affects children rather than the elderly.

The present study also documents higher incidence of malignancies, particularly metastases in the higher age groups i.e. 50-79 years. FNAC has a documented higher sensitivity in the diagnostic workup of metastatic malignancies which may be due to the fact that metastatic carcinoma cells are usually abundant and their cytologic features are dissimilar to that of the cells of normal or hyperplastic lymph nodes.[11,12] In present study, metastatic squamous cell carcinoma was found in majority of the cases (20 out of 30 cases, 66.7%). It included an interesting case of squamous cell carcinoma with granulomatous inflammation. Hirachand et al also noted that the commonest type of metastatic carcinoma to lymph node was of squamous cell variety.[13] Cervical lymph nodes, particularly high jugular and posterior cervical nodes, drain the head and neck and may harbor metastatic carcinomas originating in the nasopharynx, tonsillar fossa, tongue, floor of the mouth, thyroid, larynx, facial skin, and scalp. The findings of the study support the established fact that metastatic squamous cell carcinoma of the head and neck is frequent after the age of 40. In cases of squamous cell carcinoma in an upper cervical lymph node, panendoscopy is indicated, including biopsy of all suspected areas and blind biopsies of the common primary sites-nasopharynx, tonsil, base of the tongue, supraglottic larynx, and piriform sinus.[14]

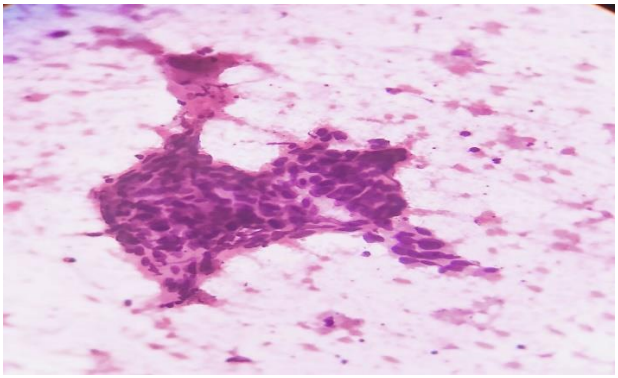

Figure 2: Microphotograph of squamous cell carcinoma deposit showing a sheet of round to polygonal cells with scanty to moderate eosinophilic cytoplasmic, high N/C ratio and pleomorphic hyperchromatic nuclei (400X H&E).

Carcinomas of the nasopharynx and oropharynx are notorious for presenting with metastases in the cervical lymph nodes while the primary neoplasm remains unnoticeable.[15] In our hospital clinical workup after FNAC diagnosis of metastatic deposits showed that majority of the cases had a primary origin in the oral cavity. FNAC is a useful prognostic tool in stage III cancers wherein metastasis to regional lymph nodes is usually found. It also aids in the diagnostic workup of a metastatic tumor of unknown origin.

The suggested protocol for the management of patients with cervical lymphadenopathy without an obvious primary site of origin starts with fine needle aspiration to establish a cytologic diagnosis.

In recent years, FNAC of lymph nodes supplemented by ancillary studies has been increasingly accepted as an approach for primary diagnosis of reactive lymphoid lesions and lymphomas.[16,17] This argument is made stronger for patients in whom the site of disease is not easily accessible, such as the retroperitoneum, because diagnostic FNAC results can preclude the need for excisional biopsy.[18]

Cytomorphologically, cases of metastatic squamous cell carcinoma showed sheets of polygonal cells with moderate amount of eosinophilic cytoplasm, high nucleocytoplasmic ratio and pleomorphic hyperchromatic nuclei with irregular nuclear borders against necrotic and lymphocytic background (Figure 2).

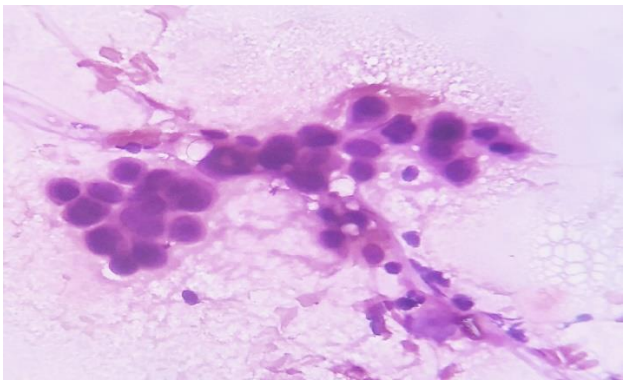

Figure 3: Microphotograph of adenocarcinoma deposit showing a sheet of round to oval cells with acinar arrangement and pleomorphic vesicular nuclei with prominent nucleoli (400X H&E).

Of the 26 cases of metastatic deposits, there were 6 cases of adenocarcinoma which included 2 cases of papillary carcinoma-thyroid, one case of anaplastic carcinoma-thyroid, one case of ductal carcinoma-breast and one case of poorly differentiated carcinoma.

Cytomorphologically, these cases showed round to oval cells arranged in sheets with focal acinar or papillary arrangement. Individual cells showed scanty to moderate amount of eosinophilic cytoplasm with pleomorphic vescicular nuclei showing prominent nucleoli. Papillary carcinoma of thyroid showed focal nuclear grooves and inclusions which helped in arriving at the diagnosis following clinicoradiological correlation.

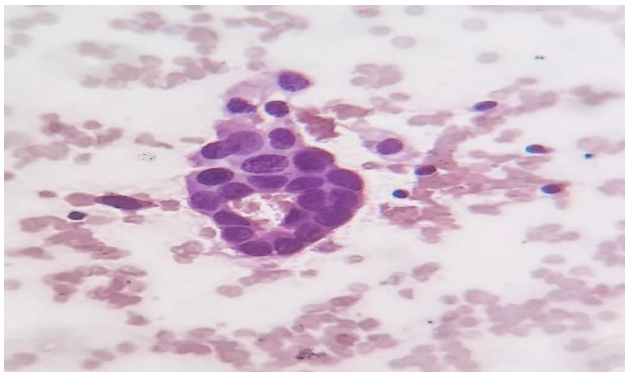

Figure 4: Microphotograph of ductal carcinoma breast secondary deposit showing a cluster of atypical round to oval cells with attempted duct formation (400X H&E).

Another case of ductal carcinoma presented with breast mass and supraclavicular lymphadenopathy (Figures 3, 4, and 5).

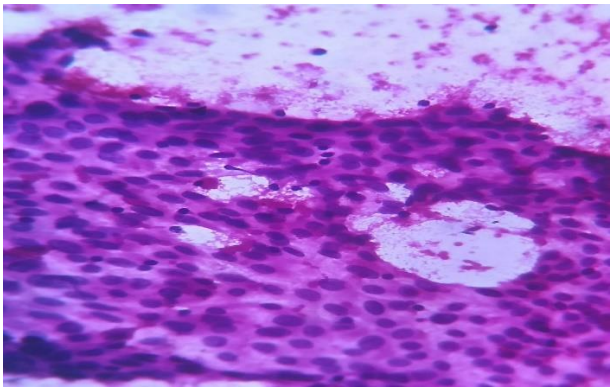

Figure 5: Microphotograph of papillary carcinoma thyroid secondary deposit showing a sheet of oval to elongated cells with anatomical borders and focal nuclear grooving and inclusions (400X H&E).

In present study, 4 cases of primary lymphoproliferative disorders (1 Hodgkins and 3 Non Hodgkins) were diagnosed on cervical node FNAC.

Non Hodgkins lymphoma showed monotonous population of lymphoid cells with scanty basophilic cytoplasm and focal nuclear cleaving or indentations. Classical Reed Sternberg cells were found in Hodgkins lymphoma scattered among polymorphous population of lymphoid cells. Cases of Non Hodgkins lymphoma presented clinically with generalised lymphadenopathy, while case of Hodgkins lymphoma presented with localised lymphadenopathy (Figure 6).

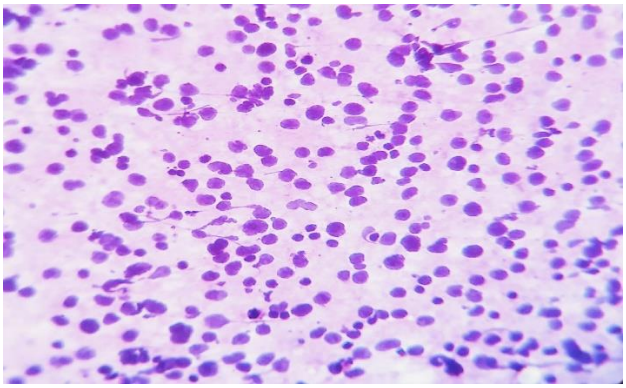

Figure 6: Microphotograph of a case of lymphoproliferative disorder (NHL) showing monotonous population of round lymphoid cells with scanty cytoplasm and nuclei with coarse chromatin, focal nuclear cleaving and indentations (400X H&E).

CONCLUSION

A myriad of lesions causing cervical lymphadenopathy can be successfully identified on FNAC. In the current study, the most common causes were non-specific reactive hyperplasia, tuberculosis and metastatic malignancies, particularly squamous cell carcinoma deposits. FNAC combined with clinical correlation can be used as a first line investigation in work up of lymph node lesions. Further management depending upon the cause can be suitably guided by this simple, cost effective procedure.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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