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### Original Article

## Role of fine needle aspiration cytology in Metastatic lymphadenopathy

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### Abstract

#### Background

The most common site for metastases is lymph nodes for various types of cancers. It is a reliable and easy approachable as well as inexpensive method of diagnosis for the patient as well as for the pathologist. So, the recognition and establishing a preliminary diagnosis on patients presenting clinically with lymphadenopathy is of importance and especially categorizing whether it is an inflammatory lesion or metastatic or primary neoplastic lesion itself of the lymphnode.

#### Material and Methods

A prospective study in 1000 patients was performed of all presenting with cervical lymphadenopathies. This study was performed in the department of pathology, Nobel Medical College and Teaching hospital, Biratnagar, Nepal from the period of January 2013 to January 2016.

#### Results

Total number of cases included was 1000 of fine needle aspiration cytology in patients presenting with cervical lymphadenopathies. Out of the total 1000 cases 800 cases were benign lesions, 110 were malignant lesions, 70 cases were inflammatory lesions while 20 cases were inconclusive. Out of the 110 malignant cases, most common malignancy was squamous cell carcinoma, adenocarcinoma followed by ductal carcinoma of breast, small cell and non-small cell carcinoma, papillary carcinoma of thyroid and few cases of malignant melanoma and undifferentiated carcinoma.

**Keywords:** FNAC, Fine Needle Aspiration cytology, Cervical Lymphadenopathies, Metastatic lesions.

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#### Introduction

Fine needle aspiration cytology (FNAC) of lymph node is an integral part of the initial diagnosis for the management of patients with lymphadenopathy due to its early availability of results, simplicity and minimal trauma with less complication [1]. FNAC is inexpensive quick and simple method that is used to sample superficial lymphnodes [2]. This procedure is cheap, easily repeatable and well tolerated by the patients and can be performed on

outpatient basis [3]. Patients suffering from non-hematological malignancies could initially present as lymphadenopathy which could be the first clinical sign and clue to the clinician. FNAC not only confirms the presence of metastatic disease, but also gives the clue regarding the nature and origin of primary malignancy and is useful for the detection of recurrence and new metastasis [4]. FNAC is most popular diagnostic aid over the world for the patients presenting with

lymphadenopathies with variable etiology such as bacterial, viral, fungal or protozoal infection as well as in diagnosis of primary lymphoid malignancies and secondary metastatic tumors [5, 6]. Enlarged lymphnode only could be the far most common presentation of metastatic cancer than malignant lymphomas, in older patients above the age of 50 years, which is easily and reliably detected by FNAC. It is very useful when combined with radiological image modalities like USG and more advanced procedures like CT or MRI, for more accurate localization of deep seated lesions [7]. It not only aids in forming a diagnosis of metastatic tumor but also helps in subtyping and its origin [7]. It is compared as a useful tool over more expensive procedures like surgical excision biopsies in developing countries with limited financial and health care resources [8]. It can avoid the need for excisional biopsy because it gives an accurate diagnosis for reactive lymphoid hyperplasia, infectious disease, granulomatous lymphadenitis, and metastatic malignancy [9].

The aim of the current work was to report the cytomorphological features of metastatic lymph node lesions.

#### **Materials and Methods**

The present study of each metastatic lymphnode was conducted in the department of pathology, Nobel medical college, Biratnagar, Nepal over a period of January 2013 to January 2016. Different doctors including radiologists, surgeons, ORL and H&N Surgeon and pathologist played a crucial role in this procedure, especially in deep seated lesions. Aspiration was done using a 23-gauge needle. 10 ml syringe was attached and aspiration was carried out. An average of 2 passes and a minimum of 4 slides were made. Material was spread with the help of another slide and fixed in 95% ethyl alcohol for Papanicolaou stain. Slides were

stained with both Giemsa and Papanicolaou (PAP) stains and wherever applicable. Smears which yielded adequate cellular material was considered as "satisfactory" and were reported as "positive for metastasis" with further subtyping wherever possible.

#### **Results**

Total aspirations of 1000 cases were done in patients presenting with lymphadenopathy. Amongst the total of 1000 cases; 110 cases were of metastatic lesions accounting for 11% of all included FNAC's of lymphnodes performed in our department. Other lymphode cases were reported as follows: reactive, infective and inconclusive. Regarding the inconclusive cases, the causes were unsatisfactory smears with very scant cellularity, frank bloody aspirate and several patients refused to repeat the FNA procedure and few patients failed to collect the reports.

Regarding the total of 110 cases reported as metastatic carcinoma, squamous cell carcinoma was the commonest comprising (65.45%), followed by adenocarcinoma (20%), ductal carcinoma of breast (3.63), small cell carcinoma (2.73%), non-small carcinoma (1.82%), papillary carcinoma of thyroid (2.73%), malignant melanoma (1.82%) and lastly undifferentiated carcinoma (1.82%). Table no: 1.

Amongst the presented lymphnodes, the most common was located in the anterior and posterior cervical triangles which was total of 55 cases (50%); followed by supraclavicular of 35 cases (31.82%), axillary was of 10 cases (9.09%), intraabdominal 3 cases (2.73%) and finally inguinal lymphnode was 7 cases (6.36%). Table no: 2.

Out of 110 total patient's male patients were 70 (63.63%) and 40 (36.36%) were female patients. Regarding the male to female, it was 1.75:1. Age variation ranged from 22 to 74 years. The maximum number amongst male patients were above

the age of 60 years accounting for 33 (47.14%), followed by 15 (21.43%) in the age group ranging from 51-60 years. Regarding the female patients, the maximum number was in the age group of 41-50 years comprising of 15 (37.5%) followed by 12 (30%) in the age group over 60 years of age. Table no: 4.

Amongst all the reported cases of metastatic carcinoma, squamous cell carcinoma was the commonest which was seen in 72 of the cases. Amongst the subtypes of squamous cell carcinoma, keratinizing squamous cell carcinoma was the commonest type 50 (69.44%), followed by non-keratinizing 15 (20.83%) and necrotizing type 7 (9.72%). Table no: 3. These lesions presented as metastatic lesions from different primary sites such as palate, buccal mucosa, tongue and alveolus. In 4 female patients presenting with axillary lymph node enlargement, the nodes were positive for metastases and these patients also presented with primary breast carcinoma. 3 cases were positive for metastatic carcinoma of papillary carcinoma of thyroid. 3 cases of small cell carcinoma and 2 cases of non-small cell carcinoma were also included in the report. Regarding the non-small carcinoma, lymph node biopsy with immunomarkers and radiological reevaluation was also advised to the patient for further categorization. Regarding the case of malignant melanoma, in both the cases patients presented with inguinal lymph node enlargement. 2 cases of undifferentiated carcinoma were also included and were advised to look for the primary site.

Table No:1 Distribution of different types of Metastatic Lesions.

Serial No	Metastatic Lesions	No of cases	Percentage
1	Squamous cell carcinoma	72	65.45%
2	Adenocarcinoma	22	20%
3	Breast Ductal Carcinoma	4	3.63%
4	Small Cell	3	2.73%

	Carcinoma		
5	Non small Cell Carcinoma	2	1.82%
6	Pappillary Carcinoma of Thyroid	3	2.73%
7	Malignant Melanoma	2	1.82%
8	Undifferentiated Carcinoma	2	1.82%
	Total	110	100%

Table No: 2 Distribution of Metastatic Lesions at various sites.

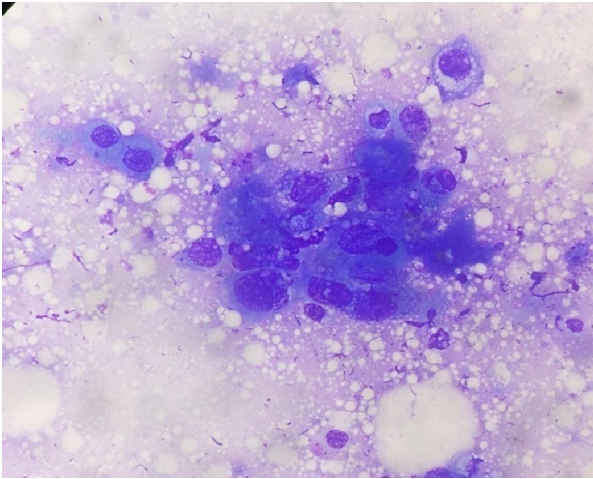
Sites	No of Cases	Percentage
Cervical	55	50%
Supraclavicular	35	31.82%
Axillary	10	9.09%
Intra-abdominal (Retroperitoneal and paracolic)	3	2.73%
Inguinal	7	6.36%
Total	110	100%

Table No: 3 Distribution of subtypes of metastatic squamous cell carcinoma.

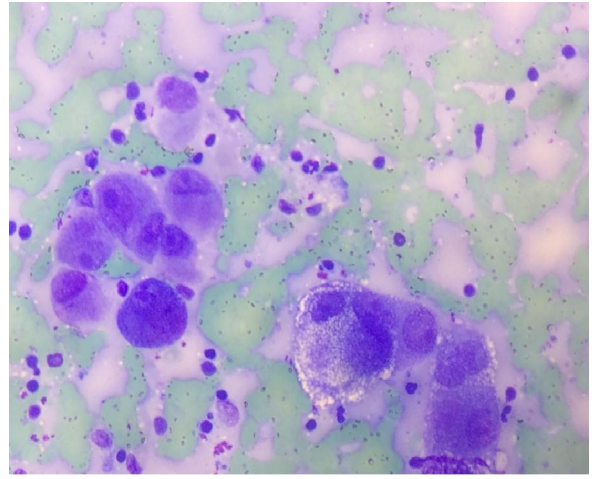
Metastatic subtypes lesions of squamous cell carcinoma	No of cases	Percentage
Keratinizing	50	69.44%
Non-keratinizing	15	20.83%
Necrotizing	7	9.72%
Total	72	100%

Table No: 4 Age and Sex distribution of the various metastatic lesions in various sites.

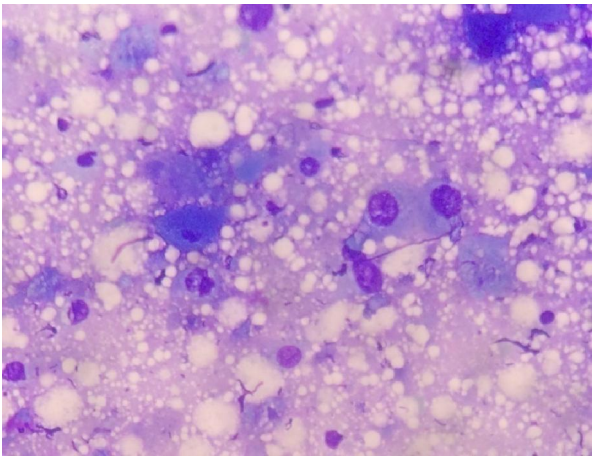
Age Group Distribution in Years	Sex				Total	
	Male		Female		No	%
	No	%	No	%		
< 30 Years	5	7.14	2	5	7	6.36
31-40 Years	8	11.43	4	10	12	10.91
41-50 Years	9	12.86	15	37.5	24	21.82
51-60 Years	15	21.43	7	17.5	22	20.0
> 60 Years	33	47.14	12	30	45	40.91
Total	70	100	40	100	110	100



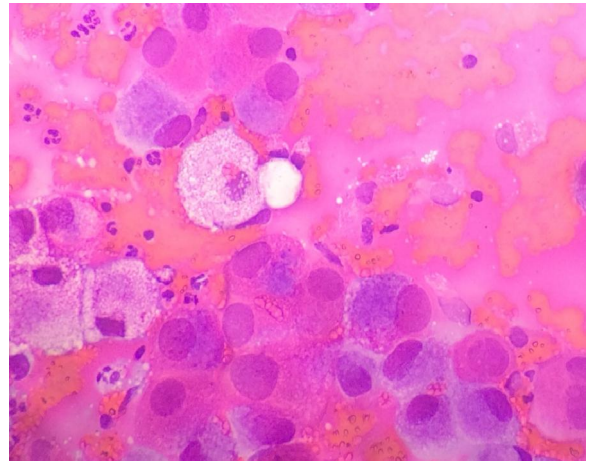
*Fig 1: Smear showing metastatic cluster of squamous cell carcinoma.*



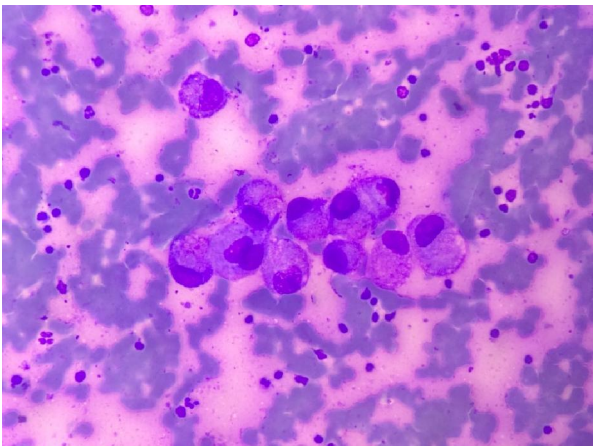
*Fig 4: Smear showing malignant cluster of metastatic adenocarcinoma.*



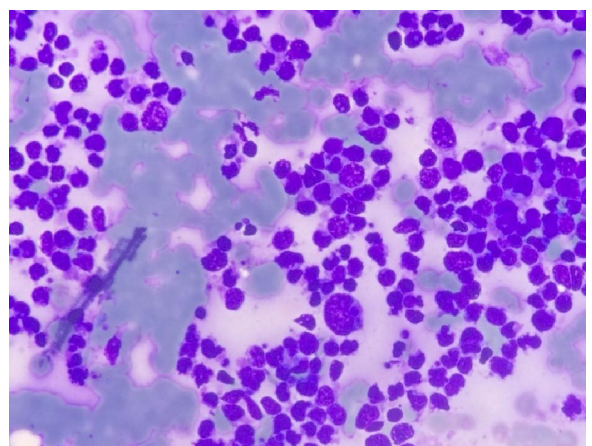
*Fig 2: Smear showing malignant squamous cell in metastatic squamous cell carcinoma.*



*Fig 5: Pap stain showing malignant clusters of metastatic adenocarcinoma.*



*Fig 3: Smear showing malignant cluster of metastatic adenocarcinoma with signet ring component.*



*Fig 6: Smear showing malignant clusters of small cell carcinoma.*

## **Discussion**

Recognition of lymphnode is of great value and importance for differentiation of the nature between different lesions like inflammatory lesions, metastatic or primary or neoplastic tumors. As we know lymphnodes are common sites for metastases in different cancers and FNAC is the diagnostic tool for lymphadenopathy in patient suspicious for malignancy, of its easy repetition and less complications. Although open biopsy still remains the golden standard for diagnosis of lymph node tumors over FNAC (Fine needle aspiration cytology) has now become an integral part of the initial diagnosis and management of patients presenting with lymphadenopathy. More than 90% of lymph node metastasis are diagnosed by initial aspiration [10]. The main aim of this study is to evaluate the role of FNAC in patients presenting with metastatic lesions of lymph node presented to our hospital.

In my present study, amongst all the metastatic carcinoma, squamous cell carcinoma was the commonest, followed by adenocarcinoma and malignant melanoma. Similar findings have been documented by other researchers [11, 12]. Out of 72 cases of metastatic squamous cell carcinoma most of the cases were keratinizing squamous cell carcinoma followed by non-keratinizing and necrotizing squamous cell carcinoma. In metastatic carcinoma the cells were arranged in sheets and singly scattered. The individual malignant cells had high N/C ratio, scant to moderate amount of cytoplasm, hyperchromatic nuclei and prominent eosinophilic nucleoli. In well differentiated type of squamous cell carcinoma, individual cell keratinization was observed, as was observed in the study done by Bagwan IN and Singh HK et al [13, 14]. If FNAC is of scant cellularity with abundant necrotic material, careful search is required for tumor cells, because

tumor cells usually show necrotic material in the background [13, 15].

Metastatic Adenocarcinoma was the second most common entity in my study. The histological features were as follows; in cases of well differentiated adenocarcinoma, the cell arrangement was predominantly acinar, followed by papillary pattern. The cells were large, cuboidal to columnar having moderate to scant amount of cytoplasm, pleomorphic nuclei with prominent eosinophilic nucleoli. Background contained mucin and individual cells also contained intracellular mucin. Sometimes it is difficult to distinguish between adenocarcinoma and poorly differentiated squamous cell carcinoma when the cell clusters show thick nuclear membrane and prominent nucleoli [16, 17]. The third type of malignancy followed by squamous cell carcinoma and adenocarcinoma was metastatic ductal carcinoma. 4 patients who presented with breast lumps had enlarged axillary lymphnode as well. Aspirated lump yielded high cellularity with malignant clusters of ductal epithelial cells. The tumor cells were bizarre and had pleomorphic nuclei with scant to moderate amount of cytoplasm and prominent eosinophilic nucleoli. Few bizarre tumor giant cells were also observed in the smears.

As we all know that malignant melanoma is a very notorious neoplasm and can metastasize to any part of the body. For example, it can occur anywhere, in head, neck, great toe, eyeballs and lymphnodes. In our study, we had two cases of metastatic melanoma, both in inguinal lymphnodes. The clusters were discohesive with pleomorphic cells having binucleate and multinucleate forms. The individual cells were large with the characteristic features of prominent eosinophilic macronucleoli, as stated by the books. In contrast to other studies, which have observed melanin pigment deposition in

25% of metastatic melanoma, both of the cases in our study had intra and extracellular melanin pigment deposition [17, 18].

### **Conclusion**

To conclude, Fine Needle Aspiration Cytology yielding a cellular material aids in diagnosing metastatic lesions elsewhere from the body. It can be considered the first line method, for investigating the nature of the lesions. It is an economical and convenient alternative to open biopsy of lymphnodes. No complication was recorded during the study with FNAC.

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