

Original Research Article

## Neoplastic Lymphadenopathy in Head Neck Region - Cytological Study

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### ABSTRACT

**Background** - FNAC is a gold standard for preoperative assessment of head and neck lymph nodes. It is safe, accurate, easy, effective, fast, minimally invasive, easy to perform and cost effective method. This study was done to evaluate the efficacy of FNAC and establish its reliability as a sole diagnostic method especially in the diagnosis of neoplastic lymph node lesions.

**Aims and objectives** - To study all neoplastic lesions involving lymph node in the head and neck region and their statistical analysis. To evaluate the diagnostic accuracy, sensitivity and specificity of fine needle aspiration technique by correlating cytological and histopathological diagnosis.

**Methods** - We prospectively studied patients referred to the cytology department with clinical diagnosis of lymph nodes swelling in head and neck from July 2011 to June 2013. Detail clinical, cytological and histopathological findings were studied.

**Results** - The technical accuracy rate was 96.12% with 1390 adequate lymph node aspirates. The malignant lymph node lesions accounted for 122 (8.77%). Metastatic malignancies were most common neoplastic lesion and were common in elderly. Diagnosis of 67 cases was confirmed on histopathological examination with sensitivity of 100 % and specificity of 97.87 %.

**Conclusion** - In this study the lymphoid lesions of head and neck region lymph node are studies with special reference to primary lymphoid and metastatic malignancies involving head and neck region lymph nodes and FNAC appears to be the highly effective method of diagnosis.

**Key words** - FNAC, Head and neck region lymph nodes, Histopathology

### INTRODUCTION

When a patient presents with lymph node mass in the head neck region, an evaluation is initiated which take in to account a lot of possibilities. Lymphadenopathy is an abnormal increase in size or change in consistency which could manifest many systemic or local diseases. The traditional workup consists of a detailed clinical history; systemic examination and laboratory work up. The common differentials which we come across in India are tuberculosis, reactive lymphadenopathy and metastatic malignancies. For diagnosis, open biopsy results in scar in this sensitive

and cosmetically important region. But FNAC of such masses is rapid, safe and direct procedure for obtaining material for cytological analysis. <sup>[1]</sup> In this study the lymphoid lesions of head and neck region lymph node are studies with special reference to primary lymphoid and metastatic malignancies involving head and neck region lymph nodes. This study was done to evaluate the efficacy of FNAC and establish its reliability as a sole diagnostic method.

### MATERIALS AND METHODS

The present prospective cytological study of head and neck lymph nodes by fine

needle aspiration cytology was undertaken in the Department of Pathology Grant Medical College and Sir JJ group of Hospitals Mumbai from July 2012 to June 2013.

The procedure of FNAC was explained to the patient and informed consent was taken. Gross characteristics of lymph nodes along with detailed clinical history and relevant investigations were noted. After giving convenient position to patient, FNAC was done with Cameco syringe holder fit on 10 ml disposable plastic syringe and 23 gauge disposable needle. Aspirate was macroscopically inspected and spread. Wet fixed smears were stained with haematoxylin and eosin (H&E) and papanicolaou. Air dried smears were stained with May-Grunwald Giemsa (MGG) and Zeil Neelson (ZN) stain where ever essential.

For histopathological study, the specimens were processed as per criteria stated by Bancroft. [2]

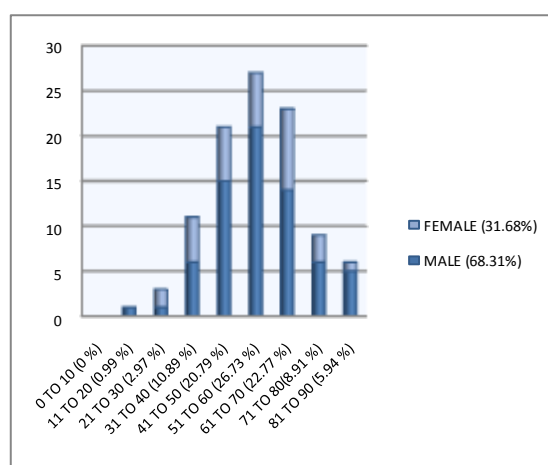
**OBSERVATIONS**

This study was performed from July 2012 to June 2013. In this duration, 2553

FNACs were performed from swellings in head and neck region of which lymph node lesions accounted for 1390 (54.4%). Majority lesions 1268 (91.22%) were non neoplastic while 122 (8.77%) were neoplastic. Only neoplastic lymph node lesions were studied.

**TABLE-1: Categorization of all neoplastic lymph node lesions in head and neck region (Total - 122)**

Metastatic	101	7.26
Non Hodgkin's Lymphoma	16	1.30
Hodgkin's Lymphoma	4	0.28
Leukemic Infiltration	1	0.07
TOTAL	122	100



**Figure 1 – Age and sex distribution of metastatic lymph nodes**

**Table-2: Distribution of metastatic lymph node lesions**

Sr.No.	Cytological Diagnosis	No. of Cases	Percentage
1	Metastatic squamous cell carcinoma [Total]	81	80.19%
I)	Squamous cell carcinoma well and moderately differentiated	72	71.28 %
II)	Poorly differentiated Squamous cell carcinoma	9	8.91 %
2	Metastatic adenocarcinoma	8	7.92 %
3	Metastatic undifferentiated epithelial malignancy with unknown primary	3	2.97 %
4	Thyroid Malignancy	3	2.97 %
5	Lung carcinoma	1	0.99 %
6	Duct carcinoma breast	1	0.99 %
7	Nasopharyngeal Ca	1	0.99 %
8	Germ cell tumor	1	0.99 %
9	Hepatocellular carcinoma	1	0.99 %
10	Renal cell carcinoma	1	0.99 %
	TOTAL	101	100 %

**DISCUSSION**

Out of the total 1390 adequate head and neck region lymph node aspirates, 101 (7.26%) showed metastatic malignancy. The incidence of metastatic malignancies in lymph node aspirates ranged from 10% to 56.81% in various studies. [3-8] The youngest patient was a 16 year old male and the oldest was an 89 year old male. More than 70% patients were in 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> decade

of life and had metastatic malignancies as predominant lesion. Less than 4% patients were younger than 30 years with male: female ratio of 2.2:1. Thus maximum patients with metastatic malignancies were elderly males. Majority of metastatic lymph nodes (96.03%) encountered were located in anterior triangles of neck.

In India squamous cell carcinoma is the most common malignancy of upper

aerodigestive tract. Here, metastatic squamous cell carcinoma was the most commonly encountered lesion. In 72 (71.28%) cases the aspirate showed metastatic well to moderately differentiated squamous cell carcinoma [Figure 2] with 9 (8.91%) showing metastatic poorly differentiated squamous cell carcinoma.

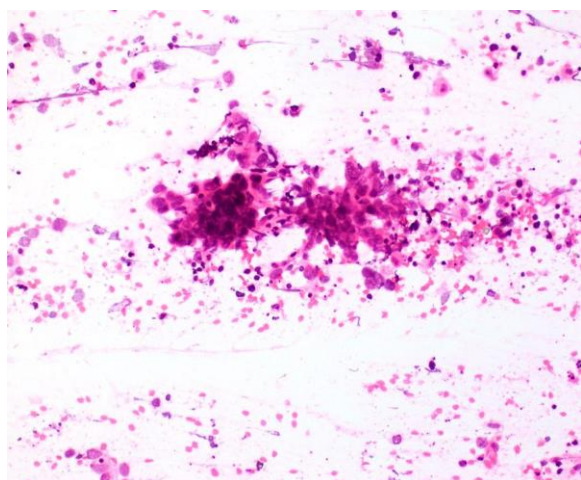


Figure 2: Clusters of moderately differentiated squamous cells with nuclear atypia and dyskeratotic cells [H & E, 20x].

Poorly differentiated squamous cell carcinoma is difficult to diagnose solely on cytology. Diagnosis of poorly differentiated squamous cell carcinoma needed clinical correlation, diagnosis of past biopsy or biopsy of present primary malignant lesion. Patients diagnosed with poorly differentiated squamous cell carcinoma had clinically and biopsy proven squamous cell carcinoma diagnosed earlier or came for post operative follow up or evaluation of enlarged lymph node after diagnosis of primary squamous cell carcinoma. Of the 72 well to metastatic moderately differentiated squamous cell carcinoma primary tumor was evident in 61 patients while in 11 patients search for primary tumor was advised. Metastatic adenocarcinoma was reported in 8 (7.92%) cases. There were 3 (2.97%) cases in which it was not possible to identify the differentiation, were put in to the category of high grade undifferentiated epithelial malignancy and search for primary tumor is advised. For such cases other specialized investigations were advised. There were 3 (2.97%) patients with

metastatic papillary carcinoma of thyroid and one case (0.99%) each from lung carcinoma (small cell carcinoma), ductal malignancy from breast, nasopharyngeal carcinoma, germ cell tumour, hepatocellular carcinoma and renal cell carcinoma [Figure 3].

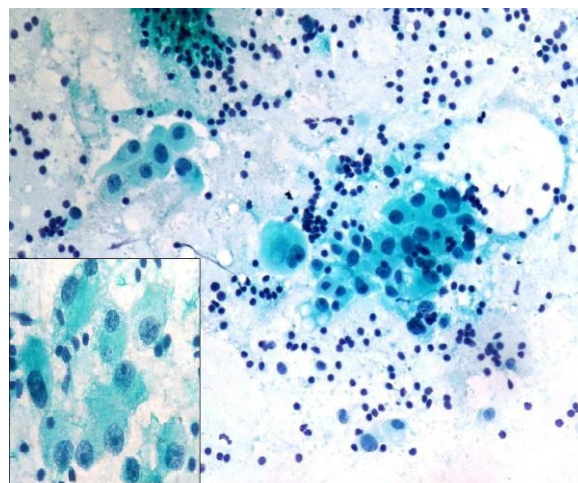


Figure 3: Clusters of cells having moderate granular to vacuolated cytoplasm and wispy borders [Inset]. Background shows lymphocytes [PAP 20x , Inset-40x]

The metastatic squamous cell carcinoma ranges from 52% to 75% [3,7-9] in various studies, correlating with our finding. In majority of the cases cytological material confirms the clinical diagnosis accepted and no further correlation with histopathology was advised especially in cases of advanced malignancies. But many times it gives clue for occult primaries and surprises with the diagnosis of malignancy when it was least suspected.

Anne R. Wilkinson et al<sup>10</sup> showed metastatic squamous cell carcinoma in 46 %, metastatic adenocarcinoma in 4% and metastatic thyroid malignancy in 8 %. Shamshad A. et al [11] found squamous carcinoma metastasis in 81.2 %, adenocarcinoma in 7.7 % and anaplastic carcinoma in 6 % cases.

A metastatic adenocarcinoma was reported in 8 (7.92%) while Hajdu et al [3] and Shaha et al [8] reported it in 25% and 15.21% respectively.

There were 2.97% (3 cases) of undifferentiated carcinomas while Raju et al [12] reported it in 3.44%.

There were 7.26 % metastatic malignancies in the head and neck regions, the high number justify immediate FNAC in suspicious cases. On correlating pattern of lymphadenopathy with age groups, it revealed that half the cases of metastatic malignant lymphadenopathy were in the 5<sup>th</sup> and 6<sup>th</sup> decade with male predominance. Thus elderly males constituted the commonest group of patients with metastatic malignancies. This may be because adult or elderly patients often react to infections with only slight to modest lymph node enlargement. Therefore, distinct lymphadenopathy in an elderly patient will arouse suspicion of malignancy. Diagnosis of metastatic malignancies in cervical Lymphadenopathy is both diagnostically and prognostically important. Possibility of a metastatic malignancy in the neck node should be kept in mind even in young adults, while attempting a cytological diagnosis as present study showed 14 % metastatic lymph nodes in 0 to 40 years age group.

**Lymphoma:**

Of the 1390 adequate lymph-node aspirates, diagnosis of lymphomas was established in 19 (1.36%).

Incidence of lymphomas in various studies ranging from 1.50% to 5.21% [13,4-6,14] as tabulated below,

**TABLE 3 : Table showing cases of lymphoma and comparison with similar studies**

Authors	Total cases	Lymphoma	Percentage
Frable and Frable (1982) [14]	1303	35	2.68
Khan et al 2002 [16]	6620	345	5.21
Chauhan S. et al 2012 [17]	400	5	1.50
Present study	1390	19	1.36

Of the lymphomas, 15 (78.94%) were Non-Hodgkin's lymphomas and 4 (21.05%) cases of Hodgkin lymphoma.

**Table 4: Comparative data analysis for Hodgkin and Non Hodgkin lymphoma**

Study	Hodgkin lymphoma	Non Hodgkin lymphoma
Russ et al [4]	55.55%	44.44%
Patra et al [6]	25%	75%
Khan et al [16]	26 %	74 %
Present study	21.05%	78.94%

**Table 5 – Table showing correlation with histopathology**

Cytodiagnosis category	Total cases	No of Biopsy	H/P Proved		False +	False -
			Non neoplastic & Benign	Malignant and suspicious		
Lymph Node	1390	68	48	20	1	0

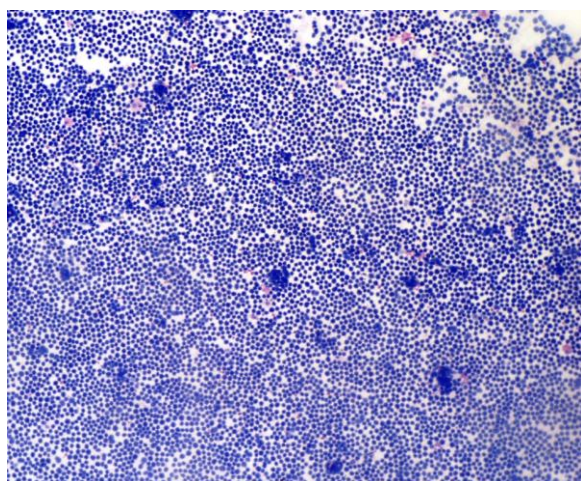


Figure 4: Monotonous population of lymphoid cells falsely diagnosed as lymphoproliferative disorder [Giemsa, 10x]

The present study one false positive diagnosis was done on cytology. In this is the case diagnosis of lymphoid malignancy was made on cytology but turned out to be benign on histopathological examination.

On cytology, a case was diagnosed as lymphoproliferative disorder [Figure:4] suggestive of Non Hodgkin Lymphoma but on histopathology it proved to be reactive lymphadenitis.

In this case, smears were highly cellular and showing numerous relatively monomorphic lymphoid cells. Reactive lymphadenitis is known to cause false positive cases. Aspirate specimens from cases of high grade lymphoma and Hodgkin’s disease may show an obvious cytomorphological abnormality, but the diagnosis of low grade lymphomas in cytological preparations is most often based on the presence of a relatively monomorphic lymphoid population, contrasting with the typically polymorphous cell pattern seen in reactive proliferations. Therefore, potential cytological misdiagnoses may occur either

in reactive proliferations in which atypical cells are identified (false positive cases) or in lymphomas that present an apparently admixed cell pattern (false negative cases). For these reasons, excision biopsy is advocated by most authors to confirm a primary cytological diagnosis of lymphoma.

## CONCLUSION

The present study concludes that accurate pathological assessment of the malignant lymph node lesions and close collaboration between the clinician and the pathologist may maximize the diagnostic potential in treatable malignancies as well as occult primaries.

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