



CORRELATION OF CYTOLOGY WITH THE HISTOPATHOLOGY IN BENIGN AND MALIGNANT LESIONS OF LYMPH NODES

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ABSTRACT

Background & Objectives: Lymph node swellings are one of the commonest clinical presentation of patients and it encompasses a wide spectrum ranging from benign lesions to a malignant lymphoma or a more obnoxious metastatic malignancy. The objective of the study was to study the role of FNAC in the evaluating lymph node swellings of cervical, axillary, supraclavicular in the body and to understand the various cytological patterns of FNAC in correlation with histopathology of lymph node swellings.

Methods: Patients referred to the Department of Pathology, CAIMS, Karimnagar from cancer Hospital and its allied branches, for palpable lymph node swelling on whom FNAC procedure was performed were included in the study. FNAC diagnosis of patients was compared with histopathology in cases which underwent surgical excision and its diagnostic accuracy was studied.

Results: Out of 280 cases which included in the study, lymph node biopsy was carried out in 150 cases, 4 cases were inconclusive. Most were in 31 to 40 years. Gender wise, there was female preponderance. Cervical group of lymph node were most affected. Benign /non neoplastic lymphadenopathies were diagnosed in 83 cases(55.5%) of cases. Metastatic deposits were diagnosed in 28 cases(18.6%) of cases. Lymphomas contributed to 39 cases(26%). On correlation of FNAC findings with histopathology. The overall correlation rate was 97.33%.

Interpretation & Conclusion: FNAC of lymph nodes is an excellent first line method to investigate the nature of lesions as it is economical and an easy alternative to open biopsy

KEYWORDS : Lymph nodes, FNAC, Histopathology

INTRODUCTION

Palpable/enlarged lymphnodes were the first to be diagnosed by fine needle aspiration and are one of the most frequently sampled tissues.¹

Cytological findings were analysed in correlation with corresponding histopathological diagnosis of the same excised nodes.

Lymphadenopathy is one of the commonest presentation in OPD with varied etiology ranging from /non neoplastic inflammatory condition to malignant. The various modalities available for this are clinical evaluation, FNAC, open biopsy. Fine needle aspiration cytology (FNAC) was introduced to reduce the number of excisional biopsies of lymph nodes. FNAC is the study of cells obtained by a small gauge needle under vacuum provided by an air tight syringe.² It is a simple, inexpensive, rapid investigative procedure with minimal trauma and low complication.³

Subsequent Histopathological examination of excised biopsy is necessary to correlate cytodiagnosis obtained by FNAC procedure.⁴ Our study is to evaluate the diagnostic accuracy of FNAC in correlation with histopathology in cases of lymphadenopathies at chalmada anand rao institute of medical sciences from may 2018 to November 2020.

MATERIALS AND METHODS

A prospective study of 2 years and 6 months from may 2018 to november 2020 was done on patients who presented with lymph node swellings and were referred to the Department of Pathology for fine Needle Aspiration Cytology (FNAC).

Methods of collection of data

Patients referred to the Department of pathology for FNAC of palpable lymph node swellings were included in the present study. The patients were clinically evaluated and the clinical

details were obtained from medical records. FNAC procedure explained to the patient including reliability. Limitation, complications and after that the consent of the patient was taken FNAC was done with the standard method for the procedure was followed. All the slides were reviewed and their diagnosis was made. FNAC diagnosis was compared with the histopathology in cases which underwent surgical excision of lymph nodes and thus its diagnostic accuracy was determined

INCLUSION CRITERIA

All patients were referred to Department of Pathology, with lymph node swellings where FNAC was done and those cases undergoing subsequent biopsy are included in the study.

EXCLUSION CRITERIA

Non lymph node sample on FNAC and inadequate material even after repeated aspiration attempts were excluded from the study.

A total of 280 patients were included in the present study, reporting to various clinical department with history of lymph node swellings. These patients were clinically evaluated. The limitations and complications of FNAC were explained to the patients. Lymph node to be aspirated was first examined thoroughly to determine the site of aspiration. Aseptic precautions were taken and aspiration of the selected lymph nodes were done. A sterile 22 or 23 gauge needle fitted to a 10 ml syringe was pierced obliquely into the lymph node.. Amount, nature of aspirated material was examined and several smears were prepared and these were stained by Haematoxylin and Eosin stain.

Ziehl Neelsen stain was done for cases where necrotic material was aspirated or clinically suspected Tuberculosis and HIV. Smears were examined microscopically and cytological diagnosis was made.

Lymph node biopsy was done in 150 cases. Lymphnodes were fixed in 10% formalin and then were subjected to grossing procedure followed by H&E staining. Special stains like ziehl Neelson and PAS were done wherever indicated.

Histopathological study was done separately and statistical analysis was done in 150 cases where results of cytological diagnosis was correlated with Histopathological diagnosis.

Table 1: Distribution of Nodes in Different Regions

Site	No. of Cases	Percentage
Cervical	96	64.0
Axillary	30	20.0
Inguinal	07	4.6666
Supraclavicular	05	3.33
Submandibular and s	7	4.66
Submental		
Other Groups	55	3.33
Total	150	100

The most commonly involved group of lymph nodes was cervical lymph nodes 96 cases (64%) followed by axillary nodes in 30 cases (20%).

Table 2-Distribution of cases by etiology

FNAC diagnosis	No of cases	Percentage
Benign	83	55.3
Metastasis	28	18.6
Lymphomas	39	26
Total	150	100

Among the 150 cases included in the study, 83cases (55.3%) were of Non Neoplastic Lesions and 39 cases were of neoplastic lesions. In the Neoplastic group, 28 cases (14%) were of Metastasis and 39(26%) were of Lymphomas.

Table 3: Distribution benign lymphadenopathies on histopathology

Histopathological	Cases	percentage
Reactive lymphadenitis	48	57.83
Granulomatous lymphadenitis	21	25.3
Suppurative lymphadenitis	10	12
Inconclusive	04	4.8
Total	83	100

In the category of benign lesions reactive lymphadenitis comprises 48 cases (57.83) where as granulomatous lymphadenitis 21(25.3%) ,suppurative lymphadenitis were 10 (12%) and inconclusive were 4 cases (4.8%) diagnosed.

Table 4: Distribution of malignant lesions

Histopathological diagnosis	No of cases	Percentage
Adenocarcinomas	09	32
Squamous cell carcinomas	07	25
Undifferentiated	05	17.8
Papillary thyroid carcinoma	02	7.1
Malignant melanoma	01	3.5

Table 8: Comparative study with others

	Our study	Anasthesio Serrano et al	Pandy p et al	Pandit aa et al	Guptha et al	Tariq et al	Adhikari et al	Hirachal et al
Site	Cervical (m/c)	67.48%	91. 89%					
Size	2 x 2cm							
Age	21-40yrs.			51.05%	52. 26%			
Gender male : female	1.05 : 1					1.2 :1 (F:M)	1:08M:F)	

Table 9 – distribution and comparative study of cases with other authors

lesions	our study	Hirachal et al	Guru Et al	Amit Et al	Anaesthesio serrano et al	Sumera et al	AH khan et al	Neesren et al	Anjali das gupta et al	Sumit giri et al
Cervical LN Involvement	64%	50.76%	78.76%	81%			-			

Others	04	14.2
Total	28	100

In the malignant lesions metastatic lesions were 28 cases out of which 9 (32 %) were diagnosed as adenocarcinomas, 7(25%) were squamous cell carcinomas , 5(17.8%) were undifferentiated carcinomas and others are papillary thyroid carcinomas and malignant melanoma etc.

Table 5 :Distribution of lymphomas

Lymphomas	No of cases	Percentage
Hodgkins lymphomas	13	33.33
Non hodgkins lymphomas	26	66.66
Total	39	100

39 Cases of lymphomas were diagnosed out of which 26 were non hodgkins lymphomas and 13 hodgkins lymphomas.

Table 6: Distribution of FNAC cases with diagnostic accuracy on biopsy specimens

FNAC	Reactive LN	Suppurative LN	Hodgkins lymphoma	NHL	metastasis	Inconclusive
Reactive	48					
Suppurative		10				
Granulomatous						
Hodgkins lymphoma			13			
NHL				26		
Metastasis					28	
Inconclusive						04
						150

Correlation between FNAC and histopathology of both benign and malignant cases were 150 out of which 4 cases were inconclusive , means 97.33 % accuracy.

These cases were misinterpreted as suppurative lymphadenitis on FNAC were actually metastasis on biopsy specimens.

Table 7: Distribution of cytohistological correlation in malignancies

Histological diagnosis	No of cases	Confirmed HP	Suspected	False negative	False positive	Accuracy
Hodgkins lymphoma	13	10	1	02	-	76.9%
Non hodgkins lymphomas	26	22	02	01	01	88.5%
Metastasis	28	28	0	0	0	100%
Total	67	60	03	03	01	89.5%

Malignant lesions - sensitivity = true positive/true positive + false negative *100
 $6700/74 = 90.5\%$

Benign lesions - specificity = true negative /true negative + false positive *100
 $8300/85 = 98.8\%$

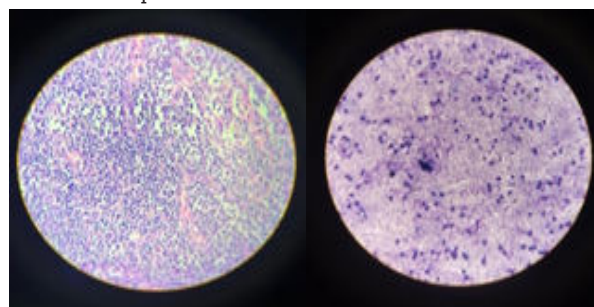
Benign lesions	81%				58.7%		91.5%			62.23
Reactive LN	57.83	41.5	46.23			76.78	28	58		34.6
granulomatous LN	25.3%					91.1				94.1
Suppurative LN	12%									
metastasis	18.6%				22.6	38.2	12.72	19.7		21.18
adenoca	32%							25.8	37.5	22
Squamous cell ca	25%					32.2		45.2	25	
NHL	17.3					6.7		5.7		1.65
HL	8.7					2	2	2.6		2.7

DISCUSSION

In the present study, majority of patients referred for FNAC were 37.7% in the age group of 21- 40 years similar to the observation of Pandit AA et al.⁵ 146(51.05%), whereas in the study of Gupta et al (1991)⁶ most of the patients 532 (52.26%) were in the age group of 0-20 years.

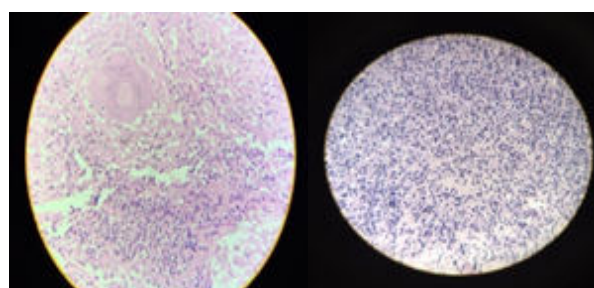
Gender distribution in the present study was skewed in favor of male :female ratio of 1.05:1. Other studies where females gender had a preponderance was Tariq et al (2008)⁷ which had 16 males and 34 females with male to female ratio of 1:2.1. Hirachand et al (2009)⁸ (68 males and 62 females with 1:0.9 ratio), Sumit Giri et al (2012)⁹ (221 males and 149 females with 1.48:1 ratio) and Adhikari et al (2011)¹⁰ (30 males and 25 females with 1:0.8 ratio) had male preponderance.

Cervical region is the commonest site of enlarged lymph nodes in the present study with 64% and Sumit Giri et al (2012)⁹ 21.89%. Adhikari et al (2011)¹⁰ and Ah Khan et al (2011)¹³ reported a lower percentage at 12.72% and 6% respectively. Nesreen et al (2011)¹⁶ reported 19.7% cases of Metastatic Deposits. In the present study 25% of the cases were reported to be Squamous cell carcinoma deposit which were second highest in the study. Same finding were also reported by Nesreen et al (2011)¹⁶ and Sumyra et al (2012)¹⁵ who reported Squamous cell carcinoma deposit at 32.2% and 45.2% respectively. First Highest Metastatic deposits were 28.6% in the present study and the same second highest was also reported for adenocarcinoma by both Nesreen et al (2011)¹⁶ and Sumyra et al (2012)¹⁵ at 32% and 22%. However Anjali Das Gupta et al (1994)¹⁷ reported the highest incidence of adenocarcinoma deposits at 37.5% and Squamous cell carcinoma deposit at 25%.



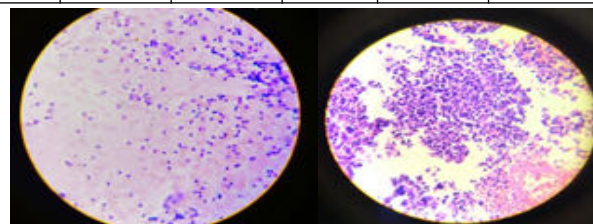
Reactive
Lymphadenitis

Suppurative
Lymphadenitis



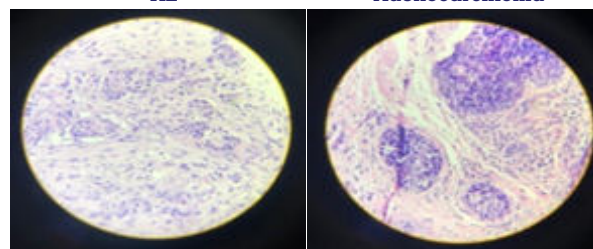
Granulomatous
Lymphadenitis

NHL



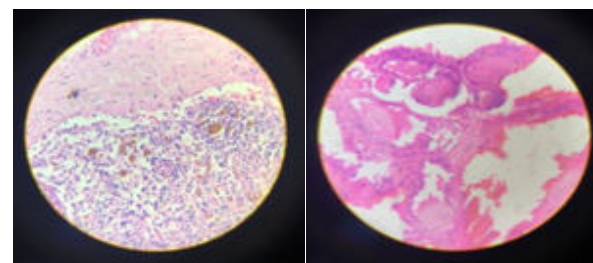
HL

Adenocarcinoma



SCC

Undifferentiated carcinoma



Malignant melanoma

PTC

In the present study Hodgkin's Lymphoma was reported in 8.7% cases and Non-Hodgkin's Lymphoma in 17.3% cases. This correlates well with Sumit Giri et al (2012)⁹ who reported 1.08% much lesser than cases of Hodgkin's Lymphoma. Nesreen et al (2011)¹⁶ and Sumyra et al (2012)¹⁵ reported 2.6% and 2% of cases of Hodgkin's Lymphoma which are slightly higher than the present study. In the case of NHL, Sumit Giri et al reported much lesser percentage of cases at 1.62% whereas Nesreen et al (2011)¹⁶ and Sumyra et al (2012)¹⁵ reported a little higher percentage of NHL cases at 5.7% and 6.5% respectively.

In the present study there were 48(57.83%) cases of Reactive lymphadenitis which were correlating with both FNAC and HPE. Adhikari et al (2011)¹⁰ reported a 100% correlation rate where as other studies had a lower correlation rate than the present study i.e. Nesreen et al (2011)¹⁶ and Sumyra et al (2012)¹⁵ 58% and 76.78% respectively. Sumit Giri et al (2012)⁹ correlated only 2 cases of reactive lymphadenitis out of 6 leading to 33.3% correlation rate.

In the present study 25.3% of cases of Granulomatous Lymphadenitis correlated well with both FNAC and HPE.(95%) correlation rate. This was close to the finding of other studies i.e. Sumyra et al (2012)¹⁵ and Sumit Giri et al (2012)⁹ which had 91.1% and 94.11% correlation rate. Adhikari et al (2011)¹⁰ correlated 34 out of 39 cases (87%) correlation rate. Nesreen et al (2011)¹⁶ could correlate 7 out of 10 cases yielding 70% correlation rate.

In the present study 10 cases(12%) of Suppurative Lymphadenitis out of 10 could correlate well on both FNAC and HPE (100% correlation rate). Patra (1983)¹⁸ could correlate all the cases of Suppurative Lymphadenitis (100% correlation rate).

In the present study all the cases correlated well yielding a 100% correlation rate. Sumit Giri et al (2012)⁹ and Nesreen et al (2011)¹⁶ correlated 14 out of 18 Hodgkin Lymphoma cases.

In the present study all the cases correlated well yielding a 100% correlation rate. Sumit Giri et al (2012)⁹ and Nesreen et al (2011)¹⁶ reported 100% and 74% Correlation rate. The former correlated 2 out of 2 cases and Nesreen et al (2011)¹⁶ correlated 44 out of 60 Non-Hodgkin's Lymphoma cases.

In the present study all the 25 cases correlated well with both FNAC and HPE (100% correlation rate). This findings augurs well with the findings of other studies. Adhikari et al (2011)¹⁰ and Nesreen et al (2011)¹⁶ reported 100% correlation rate of Metastatic deposits. Sumyra et al (2012)¹⁵ reported a slightly lower correlation rate at 99% and 96% respectively.

The present study had an overall correlation rate of 97.33% with 146 out of 150 cases correlating with FNAC and HPE. Sumyra et al (2012)¹⁵ and Anuradha et al (1989)¹³ had a similar correlation rates of 93% and 94% respectively. Adhikari et al (2011)¹⁰ correlated 50 out of 55 cases having a slightly similar correlation rate of 91% as the present study. Bhaskaran et al (1990)²⁰ and Sumit Giri et al (2012)⁹ reported a correlation rate of 88% and 87% respectively. Nesreen et al (2011)¹⁶ had the lowest correlation rates for the comparative study at 82% (128 out of 157 cases correlating).

In the present study the overall sensitivity and specificity was 90.5% and 98.5% respectively. Sumyra et al (2012)¹⁵ reported 95% sensitivity whereas Sumit Giri et al (2012)⁹ and Nesreen et al (2011)¹⁶ reported similar sensitivity rate of 90.3% and 91% respectively. The specificity of the comparative studies i.e. Sumyra et al (2012)¹⁵, Sumit Giri et al (2012)⁹ and Nesreen et al (2011)¹⁶ were 91%, 91% and 67.2% respectively.

Table- sensitivity and specificity with comparative study of cases.

	Present study	Sumerya et al	Sumit et al	Nasreen et al
sensitivity	90.5%	95%	90.3%	91%
specificity	98.5%	91%	91%	67.2%

CONCLUSION:

Fine needle aspiration cytology is a primary diagnosis tool in the evaluation of lymph node lesions, with accuracy comparable to histopathology. At times when there is difficulty in diagnosis on cytology, excision biopsy should be done. Before the advent of FNAC the diagnosis of lymphadenopathies was done after surgical excision followed by histopathological examination. With the introduction of FNAC all the peripheral nodes that are easily accessible can be assessed through a needle to arrive at a probable diagnosis. The most frequent causes of lymphadenopathy are reactive lymphadenitis, turbercular lymphadenitis abd metastatic malignancies. FNAC alone can help in establishing the diagnosis in large number of cases. In certain alone can help in establishing the diagnosis in large number of cases. In certain situation it can be enough for diagnosis in proper clinical setting to avoid surgical procedure like biopsy. FNAC used to conjunction with clinical findings, radiological and laboratory investigations can be a cost effective method.

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