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Pathology

FINE NEEDLE ASPIRATION CYTOLOGY AND LYMPHADENOPATHIES : A RETROSPECTIVE STUDY

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ABSTRACT The present study was undertaken to analyse the frequency of diseases involving Lymph nodes and to highlight the lymph node group commonly involved. Fine needle aspiration cytology of 120 lymphadenopathy patients over a period of three years revealed tubercular lymphadenitis as the commonest cause of lymphadenopathy followed by other illnesses in decreasing order of frequency viz reactive lymphadenitis, metastases(carcinoma and melanoma), suppurative lymphadenitis, lymphomas and Rosai Dorfman disease. Most frequently affected was the cervical lymph node group.Tubercular Lymphadenitis had a slight female preponderance while the rest of the illnesses had a predilection for male gender. Upper deep cervical, submandibular and supraclavicular nodes were frequently involved by tubercular disease.Malignancy was quite frequent above forty yrs of age with involvement of supraclavicular and lower deep cervical nodes.

KEYWORDS :

INTRODUCTION

Fine needle aspiration cytology(FNAC) has several advantages over biopsy as a preliminary modality of investigation in diagnosing lymphadenopathies, it is minimally invasive hence less traumatic and cost effective with no significant complications. Diagnostic accuracy is equivalent to that of histopathology at the hands of experts1.The visual palpable peripheral nodes can be accessed easily for procuring the material via FNA. Cytological diagnosis from the material procured can be used for treatment in some cases and as a guide for further work up in other cases. The material can be subjected to various ancillary investigations2. FNA stratification of lymph node pathology gives a fairly good idea of the disease frequency involving the lymph nodes and also throws light on their distribution in different population groups.

The lymphatic system is made of complex capillary networks, collecting vessels and lymph glands or nodes4, There are nearly about 600 lymph nodes in the human body4, most of them are distributed at the head and neck region. The classification of Lymph Nodes by Henri Rouviere in 1938 based upon anatomical landmarks was not user friendly in clinical situations, recent classification systems are based on diagnostic imaging. The following Lymph Node groups are present in the cervical region namely Submental, Submandibular, Deep cervical nodes (Upper, Middle and Lower) along the IJV, Supraclavicular and Anterior cervical group. The word lymphadenopathy as described in the literature indicates an abnormality either of the number ,size or consistency of the Lymph nodes5. The size of the node as an indicator of pathology is a matter of controversy, enlarged lymph nodes could be an incidental finding when examined for some other reason or may be the initial clinical presentation of the disease process itself6.Its at the discretion of the physician to either label it as a normal finding or consider them for further evaluation. certain lymph node groups such as submandibular, axillary and inguinal lymph nodes are palpable on regular examination in healthy individuals4.Lymph nodes of 1 cm diameter in the submandibular region of children/young adults and nearly 2cm diameter in the inguinal region of healthy adults are considered a normal finding6 . There is no standardized measure of the lymph nodes to label them abnormally enlarged, nor do we have adequate guidance in existing literature with regard to this issue7, the controversial aspect of this particular matter appears to stem from anatomical and physiological variations in healthy individuals, however there are varied opinions among authors with regard to the size of lymph nodes that should be considered abnormal, Lymph nodes less than 1cm diameter are of nonspecific aetiology8, Majority of them agree to label the lymph nodes abnormal when it exceeds 1cm diameter mark, this holds good for almost all the lymph nodes in the body with the exception of eiptrochlear and inguinal nodes which dictates 0.5 and 1.5cm to procure the same label9. Lymphadenopathy can be localised or generalised, enlargement of two or more than two non-contiguous lymph node groups are termed generalised whereas involvement of only one group is termed localised. A quarter(25%) of the lymphadenopathies are generalised lymphadenopathy while the majority remain localised5.

OBJECTIVES:

1. To highlight the frequency of the disease process involving the lymph nodes in our set up
2. To highlight the frequency of the lymph node groups that are involved in different diseases

MATERIALS AND METHODS :

This retrospective observational study of lymph node lesions by FNAC was conducted by the cytology unit of Pathology at KVGMC&H affiliated to RGUHS, Karnataka. The study noticed assimilation of data from 2014 jan to 2016 dec (36 months).

The 120 cases assimilated in the present study were referred to by various departments with a maximum from ENT followed by Surgery and Medicine. The clinical, cytological and other relevant details of the patients were accessed at medical record section of the hospital. The patients were stratified based on the the cytomorphologic patterns.

With regard to the tuberculosis the data accessed revealed a thorough scrutiny being performed on suspected cases of tubercular lymphadenitis to eliminate the possibility of atypical mycobacterial infections, Pulmonary Tuberculosis, BCG vaccination induced adenitis, and other granulomatous disorders. Appropriate investigations had been carried out to confirm the same.

The aspirations were performed on visible and palpable nodes without any guidance except for a few vague ones where imaging techniques such as ultrasound and computerized tomography were resorted to. Aspirations noted the usage of 10 cc disposable syringe with 21and 22 G needle. The number of slides prepared varied from case to case with three being the average for majority of them, two slides destined for papanicoloau and hematoxylin/eosin were fixed in carnoy's and the third for leishman was air dried, the suspected cases of tuberculosis had three more slides in addition for ziehl-Neelsen stain. Microscopic examination of all the slides were carried out using 5, 10, 40 objectives except for Z-N stained slides where Oil immersion was preferred.

OBSERVATIONS/RESULTS :

LESION STRATIFICATION

Clinically diagnosed and cytologically confirmed lymphadenopathy cases were stratified as Indicated in Table 1.

Table 1 . CYTOLOGICAL STRATIFICATION OF LYMPH NODE PATHOLOGY

	Lymphadenopathy Patterns	No of cases	Percentage	
NON NEOPLASTIC/ BENIGN DISEASES	Tubercular Lymphadenitis	43	35.83%	70.83%
	Reactive Lymphadenitis	31	25.83%	
	Suppurative Lymphadenitis	10	8.33%	
	Rosai Dorfman Disease	1	0.83%	
NEOPLASTIC /MALIGNANT DISEASES	METASTATIC MALIGNANT TUMOR			
	Carcinoma	25	20.83%	29.16%
	Melanoma	1	0.83%	
	LYMPHOMAS			
	Non Hodgkins Lymphoma	5	4.16%	
	Hodgkins Lymphoma	4	3.33%	

There were 85 cases(70.83%) in the benign category and35 cases(29.16%) in the malignant category.The tubercular, 43 cases (35.83%) and reactive lymphadenitis31 cases (25.83%) constituted the major chunk in the benign category with a minor contribution by suppurative lesion 10 cases (8.33%) and Rosai Dorfman Disease 01 case (0.83%). Of the 35 cases(29.16%) in the malignant category 26 cases(21.83%) belonged to the metastatic group while 9 cases (7.49%) were that of lymphomas.NHL and HL had 5 and 4 cases each accounting for 4.16% and 3.33%.

AGE, SEX AND PATTERNS

Benign cases were spread uniformly in all decades of life, the malignant ones had a predilection for older people above 40 yrs, the incidence rising with age (Table 2)

Table 2 . AGE DISTRIBUTION AND LYMPHADENOPATHIES

Age	Reactive Lymphadenitis	Tubercular Lymphadenitis	Suppurative Lymphadenitis	Metastasis	Lymphomas NHL	Lymphomas HL	Rosai Dorfman Disease
0-10	4	3	-	-	-	-	-
11-20	6	9	1	-	-	1	-
21-30	6	9	2	-	-	1	-
31-40	4	10	2	-	-	1	-
41-50	4	6	2	11	1	1	-
51 & above	7	6	3	15	4	-	1

Sex distribution observed an overall male preponderance, tubercular lymphadenitis had a female predominance. (Table 3)

Table 3. SEX DISTRIBUTION IN LYMPHADENOPATHIES

	Male	Female
Tubercular Lymphadenitis	19	24
Reactive Lymphadenitis	20	11
Suppurative Lymphadenitis	5	5
Rosai Dorfman Disease	1	0
Malignancy	24	11

LYMPH NODE GROUPS AND SIZE

Cervical lymph node group was the most commonly affected group in all the categories of illnesss. Cervical group was involved in 100 cases(83.33%), nearly 45 had Rt sided involvement and 38 had left sided involvement with 17 cases having bilateral involvement. Axillary group with 7 cases(5.83) had equal distribution of sides, Rt and Left had 3 cases each, one case had bilateral involvement. Inguinal group with 5 cases(4.16%) had a predilection for right side(3 cases)with no bilateral involvement. Eight of them had generalised lymphadenopathy. (Table 4)

Table 4 . LYMPH NODE GROUP AND LATERALITY

Lymph Node Groups	Cases			Laterality	
	Number	Percentage	Rt	Lt	Bil
Cervical	100	83.33	45	38	17
Axillary	7	5.83	3	3	1
Inguinal	5	4.16	3	2	-
Generalized	8	6.66	8		

Reactive group had a lymph node size of around 2 cm and less whilst rest other categories including those diagnosed as malignant had a size of > 2cms, majority of the malignant cases had bigger nodal size. (Table 5)

Table 5 . NODE SIZE IN LYMPHADENOPATHIES

	< 2cms	> 2cms
Tubercular Lymphadenitis	13	30
Reactive Lymphadenitis	19	12
Suppurative Lymphadenitis	3	7
Rosai Dorfman Disease	0	1
Malignancy	11	24

DISCUSSION :

Lymphadenopathies are quite common in clinical practice and calls attention for their evaluation, One of the commonest and quintessential Procedure for their evaluation without any doubt would be the time honoured conventional FNAC. The rapidity, accuracy and cost effectiveness of the procedure makes it an invaluable tool for the diagnosis of lymphadenopathies. Excisional biopsies for lymphadenopathies can be avoided as the diagnostic accuracy of FNAC is nearer to that of excisional biopsy.

The benign Illnesses encompassing tubercular and reactive lymphadenitis constituted the major bulk with few suppurative cases and an occasional Rosai Dorfman disease. Neoplastic category encompassing metastatic malignant tumors and Lymphomas accounted for nearly less than a third of the total cases. Metastasis were notably from carcinomas and a single case of melanoma. The lymph node groups involved, the age groups affected, their size and the sex predilection would be considered in the respective categories however a brief mention of the group here would suffice. Cervical group of lymph nodes were the most frequently involved overall. The axillary and inguinal groups were affected in a few cases, eight cases of generalised lymphadenopathies from lymphomas and tuberculosis were recorded.

Tubercular Lymphadenitis was the most common pattern encountered in the present study with a total of 43 cases (35.83%) contributing to one-third of the bulk. Ruchi et al11 and Rani12 et al in their studies noted tubercular lymphadenitis as the most common pattern of lymphadenopathy whereas Mainali et al13 and Vimal et al14had reactive lymphadenitis as the most common pattern.

The lymph node groups of head and neck region i.e cervical group were most often involved, there was a predilection for deep cervical, submandibular and supraclavicular groups. Most of them were solitary with a small number having bilateral involvement (6/43). Generalized lymphadenopathy was the feature in three of the cases (3/43). Lymph nodes were firm in consistency with a few cases of matting. Axillary and inguinal regions had one case to their credit.

There was fairly a uniform distribution in all age groups with slight female preponderance, 24/43 cases .The lymph node groups affected and sex preponderance were comparable to the studies of Ruchi & Rani et al11,12 with Rani et al12 having a male preponderance in their studies.

Granuloma without necrosis was the most common cytomorphological pattern in our series, the cytological patterns considered were in accordance with those described by Das et al10. Ziehl-Neelsen stain for AFB had maximum positivity rates for cheesy aspirates as opposed to the purulent ones of Metre et al16 in their study on 255 cases of tubercular lymphadenitis. Afrose et al15 also documented a significant AFB positivity in pattern having neutrophil exudates (purulent ones) Reactive Lymphadenitis was the second most common pattern in our study the observation of which were similar to that of Ruchi et al and Rani et al. There was no predilection for any age group in our series as opposed to the studies of Mainali et al13 and Ruchi11 et al who documented a major chunk in first two decades, the affected cervical nodes were firm with a size of less than 2 cms in majority of them, there was a male sex preponderance.

Suppurative Lymphadenitis had ten cases to its credit, the cervical nodes were firm in consistency measured more than 2 cms with an equal sex distribution. Ziehl -Neelsen stain performed on few of the cases with no overt infection did not reveal any acid fast bacilli.

Rosai Dorfman Disease - An unusual case presented at fifty years of age had Rosai-Dorfman histiocytes with admixture of lymphocytes, plasma cells and classic histiocytes.

Malignancy as a cause lymphadenopathy was the third common category in our study, these were similar to the studies by other authors. Metastatic malignant tumors were much more common when compared to lymphomas accounting for 74.28% (26 cases) in the malignant category and 21.66% in overall distribution, Metastatic Squamous cell carcinoma was the commonest pattern with a meagre contribution from adenocarcinoma, there was a single case of metastasis from malignant melanoma reported in our series. The lymph nodes commonly affected were supraclavicular and lower deep cervical groups, majority of them measured a size greater than 2 cms and were hard in consistency. There was a significant preponderance for male sex, majority of the cases involved were more than 40 yrs, the incidence increasing with age.

Lymphomas accounted for nearly a quarter of the bulk in the malignant category 25.71% (9/35 cases) and 07.49%(9/120 cases) in overall distribution, Five of them were NHL(5/9)whereas four belonged to HL category(4/9cases), NHL cases were distributed in 4th and 5th decades while HL had a uniform distribution from 2nd - 5th decade with one case each.

Our studies were in tune with Ruchi11 and Rani12 et al who had malignancy as the third most common pattern with 38/656 cases and 104/ 957cases each with a contribution of 25 and 91 cases by metastatic group. Anila KR et al17 in their study at Regional Cancer Centre had 270 lymph node aspirates of which malignancy was the most common pattern, metastatic deposits(130 cases,48.2%) had a major share with a minor contribution by lymphomas(16 cases,5.9%). This study was undertaken in a referral centre and on selected cases.

CONCLUSION:

Tubercular lymphadenitis was the commonest pattern followed by reactive lymphadenitis and malignant illnesses. Cervical group lymph nodes were the most often affected in all patterns.The time honoured conventional fine needle aspiration cytology plays a significant role in establishing the diagnosis as a first line investigatory procedure with considerable accuracy thus avoiding excision biopsies in majority of the cases. FNAC is easy, safe, cost effective, rapid, and can be performed by even the less skilled. FNAC is an indispensable tool in diagnosing metastatic deposits.

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