

FINE NEEDLE ASPIRATION CYTOLOGY STUDY OF CERVICAL LYMPHADENOPATHY

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ABSTRACT**BACKGROUND**

The current study is a descriptive study done at a tertiary care hospital to evaluate the significance of the diagnostic technique of fine needle aspiration cytology (FNAC) in cervical lymphadenopathy and to study the cytomorphological patterns of various conditions.

MATERIALS AND METHODS

The study includes 250 cases undergoing FNAC for cervical lymphadenopathy over a period of 18 months and diagnosing various conditions based on cytological features of the aspirates. Also, correlation is done of various diagnoses with age and gender of cases.

RESULTS

Study results show that the most commonly affected age group to be 31 to 40 years with male predominance. Most common cytological diagnosis was reactive lymphadenitis with most common malignant cause of cervical lymphadenopathy being metastatic squamous cell carcinoma. Many cases of granulomatous lymphadenitis were also seen where Ziehl-Neelsen (ZN) staining was done.

CONCLUSION

FNAC is a safe and easy diagnostic method and offers many advantages to clinician and pathologist in cervical lymphadenopathy.

KEY WORDS

Cervical Lymphadenopathy, Fine Needle Aspiration Cytology, Reactive, Granulomatous, Lymphoma.

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BACKGROUND

Fine needle aspiration cytology (FNAC) technique was first used for diagnostic purpose by Dupuytren¹ and then a few decades later applied by Greig and Grey² for diagnosis of cause of lymphadenopathy. Zajicek in Sweden formed the first specialized cytopathology services which led to further appreciation of this methods significance in diagnostic process.³

Lymphadenopathy is one of the most common and at times the first clinical sign of any disease in the body be it infective, benign or malignant. Application of the simple, rapid, relatively safe method of FNAC in evaluation of cervical lymphadenopathy is invaluable. Use of FNAC can either diagnose the condition in many cases or even guide the clinician for proper management of patient.

Aims and Objectives

1. Study of role of FNAC in evaluation of cervical lymphadenopathy.
2. Study the cytomorphological patterns of aspirates of cervical lymphadenopathy in various conditions.

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**MATERIAL AND METHODS**

The current study was initiated after obtaining permission from Institutional Ethics committee. This descriptive study was undertaken in department of Pathology of a tertiary care hospital in city of Udaipur from January 2014 to June 2015 during which 250 patients having cervical lymphadenopathy were referred for procedure of FNAC from various departments. Prior to the procedure all relevant clinical details were obtained and informed consent of FNAC was taken. FNAC was performed taking care of all aseptic precautions using 22-23-gauge needle attached to 10 cc syringe. The smears prepared from aspirated material was stained using Papanicolaou stain and Field's stain. Also, Ziehl-Neelsen (ZN) staining was used in cases where diagnosis of granulomatous disease was made to detect acid fast bacilli (AFB). The diagnoses were classified according to their cytomorphological patterns and correlated with age and gender of patients.

RESULTS

The current study conducted at a tertiary care hospital in Rajasthan included 250 cases where FNA was performed on cervical lymphadenopathy. There was male predominance of cases in this study with male to female ratio being 2.6:1. Most of the cases were in age range of 31 to 40 years (18%) as shown in Table 1. Cytomorphological patterns of the aspirates were studied to find out cause of lymphadenopathy. Most cases presented with fever and most commonly mid cervical nodes (26.8%) were enlarged. Benign lesions outnumbered malignant lesions in this study with ratio of benign to malignant coming as 1.4:1. The single most common diagnosis in the study was of reactive lymphadenitis (Figure 1) seen in

82 cases making 32.8% while second most common diagnosis was granulomatous lymphadenitis (Figure 2) seen in 59 cases (Table 2). There were 95 cases of metastasis in cervical lymph nodes out of which metastasis from squamous cell carcinoma (Figure 3) was detected in 52 cases making up 20.8% of all cases. Metastasis from adenocarcinoma was seen in 10 cases. The current study had 9 cases of primary malignancy of lymph node of which 7 were diagnosed as non-Hodgkin's lymphoma (Figure 4) and 2 cases as Hodgkin's lymphoma. Malignant lesions were most common in age range of 61 to 70 years. Cytomorphological features of granulomatous lymphadenitis were classified into 3 patterns as proposed by Das et al.⁴ 'Epithelioid cell granuloma with necrosis' was the commonest pattern seen in 31 out of 59 cases of granulomatous lymphadenitis making up 52.5% of these cases. ZN staining for AFB was also done in cases of granulomatous lymphadenitis. AFB were seen in 29 out of 59 cases (49.1%) as shown in Table 3. Least number of AFB positive cases were seen in the 'epithelioid cell granuloma without necrosis' pattern of granulomatous lymphadenitis.

	Male	Female	Nos.	Percentage of Cases (%)
0-10	23	13	36	14.4
11-20	18	12	30	12.0
21-30	19	18	37	14.8
31-40	33	12	45	18
41-50	23	10	33	13.2
51-60	24	7	31	12.4
61-70	24	2	26	10.4
71-80	5	2	07	2.8
Above 80	5	0	05	2.0

Table 1. Age and Gender Distribution of Cases

Diagnosis	Number	(%)
Benign Lesion		
Reactive Lymphadenitis	82	32.8
Granulomatous Lymphadenitis	59	23.6
Acute suppurative Lymphadenitis	5	2
Malignant Lesion		
Metastatic Squamous Cell Carcinoma	52	54.74
Metastatic Adenocarcinoma	10	10.53
Metastatic Undifferentiated Carcinoma	27	28.42
Other Metastatic Lesions	6	6.32
Hodgkin's Lymphoma	2	
Non-Hodgkin's Lymphoma	7	

Table 2. Cytopathological Diagnosis- Distribution of Lymph Node Lesions

Cytomorphological Features	No. of Cases	(%)	AFB Positivity	Percentage of AFB Positivity
Epithelioid Cell Granulomas without Caseous Necrosis	12	20.4	2	16.7
Epithelioid Cell Granulomas with Caseous Necrosis	31	52.5	16	51.6
Caseous Necrosis with or without Polymorphonuclear Cells and Occasional Epithelioid Cells	16	27.1	11	68.7
	59		29	49.1

Table 3. Cytomorphological Features in Granulomatous Lymphadenitis Correlating with AFB Positivity

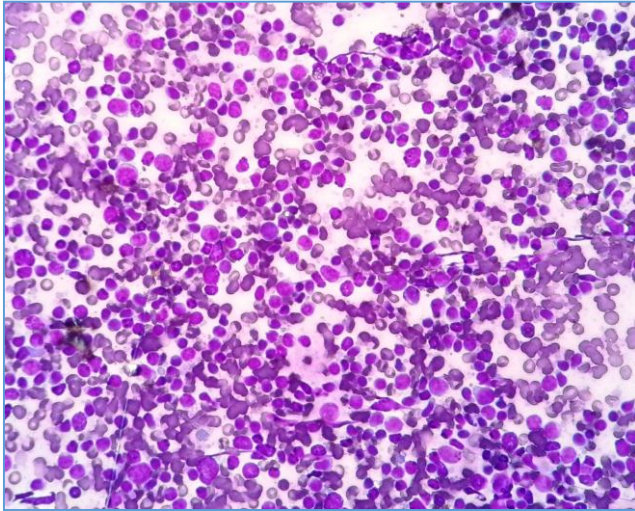


Figure 1. FNAC Smear of Reactive Lymphadenitis showing Polymorphous Population of Reactive Lymphoid Cells (40x, Field's Stain)

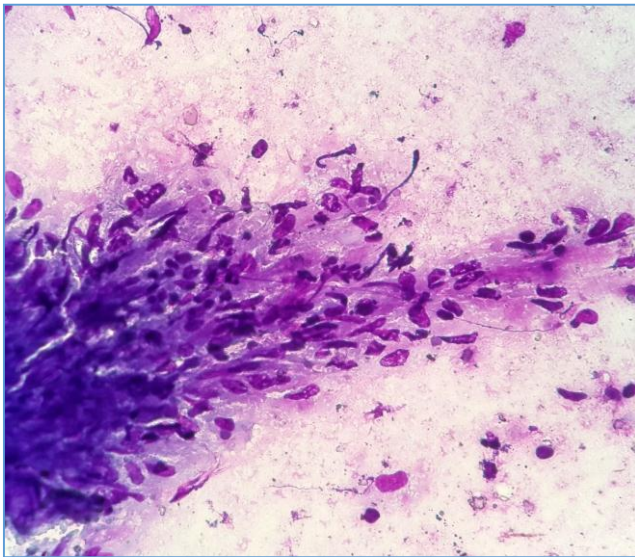


Figure 2. FNAC Smear of Tuberculous Granulomatous Lymphadenitis showing Epithelioid Cell Granuloma on a Necrotic Background.

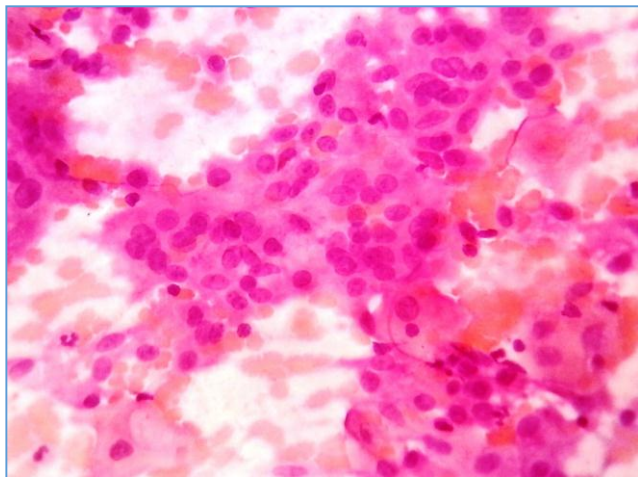


Figure 3. FNAC Smear of Metastatic Squamous Cell Carcinoma Lymph Node showing Cluster of Tumor Cells Replacing Normal Lymphoid Cells.

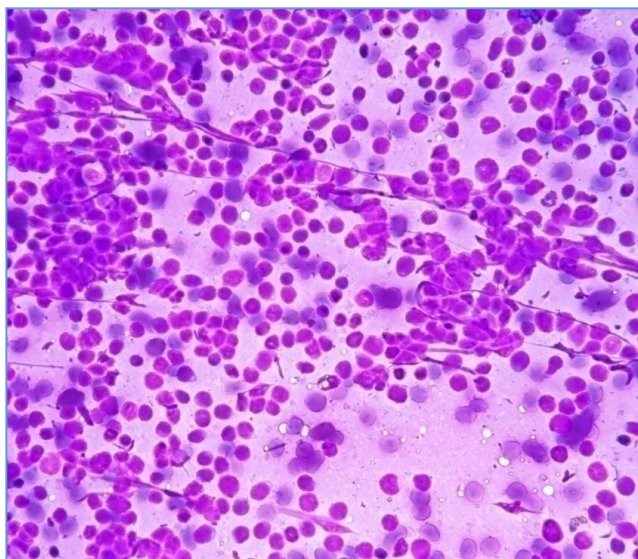


Figure 4. FNAC Smear of Non-Hodgkin's Lymphoma showing Monomorphic Population of Atypical Lymphoid Cells with Round Nuclei (40x, Field's stain)

DISCUSSION

FNAC is a very helpful and important diagnostic technique to help in diagnosis of cervical lymphadenopathy. The mean age of the cases in the current study was 37.5 years. The mean age is slightly higher than those of studies done by Abdulrahman et al⁵ and Bargotra et al⁶ while being similar to Chand et al.⁷ The most common age range undergoing FNAC for cervical lymphadenopathy in current study was 31- 40 years range which is correlating to study results of Narang et al⁸ and Hirachand et al.⁹ The current study had 180 male patients and 70 females, with male to female sex ratio coming out as 2.6: 1. This was much higher than the study results of Ishar et al¹⁰ and Hirachand et al.⁹ The most common diagnosis in the whole study was reactive lymphadenitis. It was more in paediatric and young adults. This result was similar to Hirachand et al.⁹ Granulomatous lymphadenitis was the commonest diagnosis in studies of Pandav et al¹¹ and Hafez et al.¹² Metastatic lesions of cervical lymph nodes were diagnosed in 95 cases of the total 250 cases in the study (38%). This was higher than results of

studies conducted by Pandav et al¹¹ and Hafez et al.¹² This could be attributed to two causes. First is the unchecked and somewhat increasing use of tobacco and its related products in various forms which predisposes to various malignant conditions. Second could be the presence of a fully functional cancer research institute setup at our institute, from which many cases were referred for FNAC. Of all the metastatic cases, the most common diagnosis was squamous cell carcinoma, seen in 52 cases, making up 20.8% of all lesions. This was in correlation to studies conducted by Hirachand et al⁹ and Bagwan et al.¹³ In a study conducted by Ghartimagar et al¹⁴ in Nepal, the most common metastatic lesion was adenocarcinoma. The lymphomas were seen in a total of 9 cases, making up 3.6% of lesions. Of these 7 cases were of Non-Hodgkin's lymphoma and 2 cases of Hodgkin's lymphoma. This was similar to study results of Pandav et al¹¹ which was an India based study. A study done in Egypt by Hafez et al had 49.7% of his cases (78 of 157) diagnosed as lymphoma of lymph node on FNAC.¹² Granulomatous lymphadenitis was the diagnosis in 59 cases (23.6%). It was diagnosed on recognition of three patterns as described by Das DK et al⁴ which were Type 1- Epithelioid cell granulomas without caseous necrosis, Type 2- Epithelioid cell granulomas with caseous necrosis and Type 3- Caseous necrosis with or without polymorphonuclear (PMN) cells and occasional epithelioid cells. Of the 59 cases maximum 31 cases (52.5%) were of type 2 followed by 16 cases of type 3 and 12 cases of type 1. In our study, most common cytomorphological pattern observed was pattern 2 (48.1%) similar to study of Hemalatha et al,¹⁵ and it was higher than studies done by Nidhi et al,¹⁶ and Chand et al⁷ (16.4% and 21.8%, respectively). In the current study, pattern 3 and pattern 1 were noted in 33% and 18.9% cases, respectively. These findings were comparable to studies done by Nidhi et al¹⁶ and Hemalatha et al.¹⁵ Study done by Lakhey et al¹⁷ had most cases showing pattern type 3, 84 of his 172 cases. Ziehl Neilsen staining was done in cases where granulomatous lymphadenitis was diagnosed. Of the three cytomorphological patterns described, the pattern type 3 had maximum AFB positivity in with 11 out of the 16 cases (68.7%). The commonest pattern that was type 2 had 51.6% positivity with 16 out of 31 cases showing AFB. These findings were similar to study results of Pandav et al¹¹ and Hemlatha et al.¹⁵ The overall AFB positivity of the current study was 49.1% with 29 of the 59 cases of lymphadenitis being AFB positive. This was similar to study results of Das DK et al⁴ and Masilamani et al,¹⁸ but higher than that of study conducted by Pandav et al.¹¹

CONCLUSION

The present study draws attention to the significance of FNAC in diagnosis of the cause of cervical lymphadenopathy. It is a simple, rapid and cost-effective diagnostic method. The commonest causes of cervical lymphadenopathy are reactive lymphadenitis, granulomatous lymphadenitis and metastatic squamous cell carcinoma. When ZN staining is used along with routine staining techniques in cytology of granulomatous lymphadenitis, it leads to reconfirmation of diagnosis. Our results establish the use of FNAC in various cervical lymph node lesions and indicate that it offers many advantages to clinician and pathologist, as it is an easy, safe and reliable diagnostic method.

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