www.jmscr.igmpublication.org Impact Factor 3.79
ISSN (e)-2347-176x

IGM Publication Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

# Reliability of Fine Needle Aspiration Cytology (FNAC) As A Diagnostic Tool In Cases of Cervical Lymphadenopathy

Authors
**Dr. Mayuri Rajendrakumar Gohil[1], Dr. Keyur Nileshbhai Parmar[2], Dr. Parth Rajendragiri Goswami[3]**
[1,3]Tutor, Department of Pathology, Government Medical College, Bhavnagar
[2]Consultant Neuropsychiatrist, Private Practitioner, Bhavnagar.
Corresponding Author
**Dr. Mayuri Rajendrakumar Gohil**
Address: 19, Shree Krishna Park Society, Victoriya Park Road, Near Himalaya Mall, Bhavnagar.
Mobile: 9909903514

**ABSTRACT**

**Background:** *FNAC is a simple, safe, cost effective, quick as well as an efficient diagnostic procedure with relatively no contraindications and no side effects. The aim of this work is to evaluate the reliability and diagnostic accuracy of fine needle aspiration cytology (FNAC) of cervical lymph nodes.*

**Method:** *100 patients who presented with cervical lymphadenopathy in the Department of pathology, Government Medical College, Bhavnagar, Gujarat, were subjected to FNAC using a 10 ml syringe and 22-24 gauge needles. All smears were stained and cytological diagnosis were made by an experienced pathologist. The patients were followed whenever possible. 27 cases were subjected to lymph node biopsy. The cytological results were compared with the histological findings wherever possible.*

**Results:** *The age of the patients ranged from 2 to 75 years. Male to Female ratio was 1.2:1.*
*FNAC diagnosis was divided into Non-Neoplastic and neoplastic lesions. Overall Reactive lymphadenitis was the most common finding(41%).Male preponderance was seen in Reactive lymphadenopathy and Female preponderance was seen in chronic granulomatous lesion as well as in metastatic carcinomas. Out of 27 biopsied cases, the overall diagnostic accuracy of FNAC for reactive lymphadenitis, Chronic granulomatous lesions, Hodgkins lymphoma, nonhodgkins lymphoma and metastasis were 87.5%,71.4%, 100%, 80% and 100%.*

**Conclusion:** *FNAC of lymph nodes proved to be a very useful tool in the diagnosis and early evaluation of enlarged lymph nodes with high sensitivity and specificity. In many cases, it reduces the need for a surgical procedure to be performed on the patient.*

**Keywords:** *cervical lymphadenopathy, Fine needle aspiration cytology, Reactive Lymphadenitis, Granulomatous lesion, Lymphoma.*

## INTRODUCTION

Lymphadenopathy is one of the commonest clinical presentations of patients, attending the outdoor clinics in most hospitals. The aetiology varies from an inflammatory process to a malignant condition[1].Fine needle aspiration cytology (FNAC) of lymph node has become an integral part of the initial diagnosis and management of patients with lymphadenopathy due to early availability of results, simplicity, and, minimal trauma with less complication[2]. FNAC has also been advocated as a useful method in comparison to more expensive surgical excision biopsies in developing countries with limited financial and health care resources[3]. It almost offers an accurate diagnosis for reactive lymphoid hyperplasia, infectious disease, granulomatous lymphadenitis, and metastatic malignancy. Thus, it can avoid the need for excisional biopsy in most cases and allow rapid onset of therapy[4].

Enlarged palpable cervical lymph nodes are common and worrying presentation in adults as well as in children. Cervical lymph nodes are involved most often in all types of lymphadenopathy particularly reactive hyperplasia and Hodgkin lymphoma[5]. Although the reliability of FNAC of cervical lymph node has been shown in some studies[6,7] but there are also some reports in contrary[8,9]. Therefore, the aim of the current study is to report the results of FNAC of cervical lymphadenopathy, that depend on the cytomorphological features alone, in comparison to the results of histopathology in an attempt to highlight the diagnostic accuracy and reliability of FNAC of lymph nodes with an emphasis on discordant cases between the cytology and the histopathology.

## MATERIAL AND METHOD

The present study comprises of 100 patients who presented with cervical lymphadenopathy in the Department of pathology, Government Medical College, Bhavnagar, Gujarat from December 2012 to November 2014. All the patients were subjected to FNAC using a 10 ml syringe and 22-24 gauge needles. Air dried smears were stained with May Grunwald Giemsa (MGG) stain and wet fixed smears were stained with Papanicolaou (PAP) stain. Additional stains i.e. Ziehl-Neelsen (ZN) stain, Periodic acid Schiff (PAS) were performed wherever necessary. The detailed history of the patient i.e. age, sex and duration of involvement and other investigations performed, were recorded. The patients were followed whenever possible. 27 cases were subjected to lymph node biopsy. The cytological results were compared with the histological findings wherever possible.

## RESULTS

A total of 100 patients were included in the study. The age of the patients ranged from 2 to 75 years. Male to Female ratio was 1.2:1.

FNAC diagnosis was divided into Non-Neoplastic and Neoplastic lesions. Overall Reactive lymphadenitis was the most common finding (41%). Male preponderance was seen in Reactive lymphadenopathy and Female preponderance was seen in chronic granulomatous lesion as well as in metastatic carcinomas.(Table 1)

**Table 1:** Prevalence of various lesions responsible for cervical lymphadenopathy.

| | Cytological diagnosis | Male | Female | Total |
|---|---|---|---|---|
| Non-Neoplastic disease | Reactive lymphadenopathy | 26 | 15 | 41 |
| | Acute suppurative lymphadenitis | 02 | 01 | 03 |
| | Chronic granulomatous lymphadenitis with necrosis | 15 | 17 | 32 |
| | Chronic granulomatous lymphadenitis without necrosis | 03 | 04 | 07 |
| Neoplastic disease | Hodgkins lymphoma | 02 | 00 | 02 |
| | Non Hodgkins lymphoma | 04 | 01 | 05 |
| | Metastatic | 04 | 06 | 10 |

Out of these 100 cases, biopsy of the lymphnode was done in 27 cases. The cytopathological results were compared with the histopathological diagnosisn of the excised lymphnode. (Table 2)

**Table 2:** Comparison of cytopathological diagnosis with the corresponding histopathological diagnosis in patients with cervical lymphadenopathy.

| Cytological diagnosis | No. of cases | Final histopathological diagnosis | | | | | Accuracy |
|---|---|---|---|---|---|---|---|
| | | RL | CGL | HL | NHL | Metastatic | |
| Reactive lymphadenitis(RL) | 08 | 07 | - | - | 01 | - | 87.5% |
| Chronic granulomatous lymphadenitis with/without necrosis (CGL) | 07 | - | 05 | 01 | - | 01 | 71.4% |
| Hodgkins lymphoma(HL) | 02 | - | - | 02 | - | - | 100% |
| Non Hodgkins lymphoma(NHL) | 05 | - | - | 01 | 04 | - | 80% |
| Metastatic | 05 | - | - | - | - | 05 | 100% |

Out of 8 cases which were cytologically diagnosed as reactive lymphadenitis, 7 cases showed exact correlation histopathologically and 1 case was diagnosed histopathologically as NHL. Thus, the overall diagnostic accuracy of FNAC was 87.5%.Out of 7 cases of CGL 5 cases confirmed by histopathologically, but 1 case was of HL and another 1 case was of metastatic malignancy. So, the diagnostic accuracy of CGL was 71.4%. In 5 cases of NHL, 1 case was found to be HL histopathologically. Thus, showed 80% diagnostic accuracy. The diagnostic accuracy of HL and metastatic malignancy were 100%, because all cases correlated with histopathological diagnosis.(Table 2) From the above findings, sensitivity and specificity of FNAC for each diagnosis were counted and tabulated.( Table 3)

**Table 3:** Reliability of cytological diagnosis with the corresponding histopathological diagnosis of cervical lymphnode.

| Cytological diagnosis | Sensitivity | Specificity |
|---|---|---|
| Reactive lymphadenitis (RL) | 100% | 87.5% |
| Chronic granulomatous lymphadenitis with/without necrosis (CGL) | 100% | 71.4% |
| Hodgkins lymphoma(HL) | 50% | 100% |
| Non Hodgkins lymphoma(NHL) | 80% | 80% |
| Metastatic | 100% | 100% |

**DISCUSSION**

FNAC is a simple, safe, cost effective, quick as well as an efficient diagnostic procedure with relatively no contraindications and no side effects. It forms an important tool for diagnosing various causes of lymphadenopathy [1,10,11].

In our study, there was a slight male preponderance with male: female ratio of 1.2:1. This is in accordance with various other studies with similar findings [1,11,12].Lymph node enlargement can occur in a diverse age group from very early age to elderly. The youngest patient in our study was 2 years of age where as the oldest was 75 years. These figures compare to the findings in other studies[1,11,12,13,14].

The causes of lymphadenopathy are diverse and range from innocuous reactive hyperplasia, suppurative pathologies and granulomatous lesions to dreaded malignancies i.e. lymphomas and metastatic carcinomas. Out of a total of 100 patients in our study, 17 were diagnosed as malignant and 83 as non-malignant on FNAC. These values are also in accordance with results of other studies[1,11,12,13,14,15].

The predominance of infective conditions in the etiology correlates well with the fact that in our country, the infectious diseases outnumber the malignant ones and also because the malignancies tend to be examined at a later age in contrast to the western countries where malignancies are reported earlier.Majority of the cases were reactive in nature (41%). These results correlate well with other studies[1,16]. Granulomatous pathology accounted for 39 cases, 32 were with necrosis and 07 without necrosis. The incidence of AFB positivity was more in cases with necrosis (29/32) in contrast to those without necrosis (01/07). This is due to the reason that abundant necrosis is seen in individuals with immunocompromised status which leads to greater AFB positivity whereas in patients with a good immune status, there is formation of more granulomas, less necrosis and less AFB positivity.

Among the malignancies, metastatic carcinomas constitute the predominant group constituting a total of 10 cases. All the cases which were subjected to histopathology(05) showed positive correlation, 100% sensitivity and 100% specificity. The majority of the metastatic carcinomas were Squamous cell carcinoma which was in accordance with various other studies[1,15,17,18,19]. Lymphomas on FNAC constituted 07 of the total cases which correlated well with other studies[1,10]. 02 were diagnosed as HL and 05 as NHL on FNA. However 1 case of HL and 1 case of Metastasis was diagnosed as granulomatous lesion on FNAC due to intense granulomatous response. Also 1 case of HL were diagnosed as NHL on FNAC but turned out to be HL on histopathology. Therefore, FNAC showed a sensitivity of 50% in diagnosing HL whereas the specificity was 100% considering histopathology as the gold standard. 4 out of 5 cases diagnosed as NHL on FNAC were confirmed by biopsy. 1 case turned out to be lymphocyte predominant HL which were confirmed by immunophenotyping. Thus the sensitivity of FNAC is diagnosing NHL was 80% where as specificity was 100%.

## CONCLUSION

FNAC of lymph nodes proved to be a very useful tool in the diagnosis and early evaluation of enlarged lymph nodes. It is useful in the diagnosis of both neoplastic and non neoplastic conditions with good sensitivity and specificity. In many cases, it reduces the need for a surgical procedure to be performed on the patient. Still histopathology remain the gold standard.

## REFERENCES


1. Hirachand S, Lakhey M, Akhter J, Thapa B. Evaluation of fine needle aspiration cytology of lymph nodes in Kathmandu Medical College, Teaching hospital. Kathmandu Univ Med J 2009;7(26):139–42.
2. Keith VE, Harsharan SK, Jerald GZ. Fine needle aspiration biopsy of lymph nodes in the modern era: reactive lymphadenopathies. Pathol Case Rev 2007;12(1):27–35.
3. Das DK. Value and limitation of fine-needle aspiration cytology in diagnosis and classification of lymphomas: a review. Diagn Cytopathol 1999;21:240–9.
4. Howlett DC, Harper B, Quante M, Berresford A, Morley M, Grant J. Diagnostic adequacy and accuracy of fine needle aspiration cytology in neck lump assessment: results from a regional cancer network over a one year period. J Laryngol Otol 2007;121(6):571–9.
5. Shakya G, Malla S, Shakya KN, Shrestha R. A study of fine needle aspiration cytology of cervical lymph nodes. J Nepal Health Res Counc 2009;7(14):1–5.
6. Sun HB, Zheng XF, Zhang J. Diagnostic accuracy of fine needle aspiration biopsy of cervical lymph node: a study of 580 cases. Zhonghua Bing Li Xue Za Zhi 2008;37(10):693–7.
7. Narang R, Pradhan S, Singh R. Place of fine needle aspiration cytology in the diagnosis of lymphadenopathy. Ind J Tuberc 1990;37(1):29–31.
8. Chieng DC, Cangiariella JF, Cohen JM. Fine needle aspiration cytology of Hodgkin disease: a study of 89 cases with emphasis on false negative cases. Cancer 2001;93(1):52–9.
9. Wakely PE. Fine needle aspiration cytopathology of malignant lymphoma. Clin Lab Med 1998;18(3):541–7.
10. Malakar D, Jajoo ILN, Swarup K, Gupta OP, Jain AP, Poflee VW. A Clinical Evaluation of Fine Needle Aspiration Cytology in the Diagnosis of Lymphadenopath. Ind J Tub. 1991; 38: 17-19.
11. Pandav AB, Patil PP, Lanjewar N. Cervical lymphadenopathy-diagnosis by F.N.A.C.,a study of 219 cases. Asian J Med Res. 2012;1(3): 79-83.
12. Qasmi SA, Kiani F, Malik AI, Salamatullah J, Farooq MO, Abassi MA. Cervical lymphadenopathy: a commom diagnostic dilemma. Journal of Surgery Pakistan (International). 2012; 17(2): 76-80.
13. Satyanarayana S, Kalghatgi AT, Muralidhar A, Prasad RS, Jawed KZ, Trehan A. Fine needle aspiration cytology

of lymph nodes in HIV infected patients. 2001;58(1):33-37.

14. Jeena PM, Coovadia HM, Hadley LG, Wiersma R, Grant H, Chrystal V. Lymph node biopsies in HIVinfected and non infected children with persistent lung disease. Int J Tuberc Lung .2000;4(2):139-46.
15. Troxell ML, Chales DB, Athena MC, Yashodha N. Cytologic diagnosis of burkitt lymphoma: role of ancillary techniques. Cancer Cytopathol. 2005;105:310-18.
16. Raghuveer CV, Leekha IL, Pai MR, Adhikari P. Fine needle aspiration cytology versus fine needle sampling without aspiration. A prospective study of 200 cases. Indian J Med Sci. 2002;56:431-9.
17. Jeffers MD, Milton J, Herriot R, McKean M. Fine needle aspiration cytology in the investigation on Non Hodgkin Lymphoma. J Clin Pathol.1998;3:189-96.
18. Singh A, Bhambani P, Nema SK. Diagnostic accuracy of FNAC in diagnosis for causes of lymphadenopathy: a hospital based analysis. Int J Res Med Sci. 2013;1(3):271-77.
19. Chauhan S, Rathod D. Joshi DS. FNAC of swellings of head and neck region. Indian Journal of Applied Basic Medical Sciences. 2011;13(17):1-6.