

ORIGINAL RESEARCH

Accuracy and role of FNAC in diagnosis of etiological profiles of lymphadenopathy

¹Dr. Sanna Nazir, ²Dr. Mohammad Aamir Haleem

¹Assistant Professor, ²Senior Resident, Department of Pathology, Government Medical College, Baramulla, J&K, India

Correspondence:

Dr Mohammad Aamir Haleem

Senior Resident, Department of Pathology, Government Medical College, Baramulla, J&K, India

Received: 15 January, 2022

Accepted: 18 February, 2022

ABSTRACT

Introduction: Enlargement of lymph node may result from the proliferation of lymphocytes intrinsic to lymph nodes, due to an infection or a lymphoproliferative disorder or from the migration and infiltration of nodal tissue by either intrinsic inflammatory cells or metastatic malignant cells. The aim of the present study was to investigate the Accuracy and role of FNAC in diagnosis of etiological profiles of lymphadenopathy and its comparison to histo-pathology examination.

Materials and Methods: Lymph node biopsies were received in 72 patients and the biopsy specimens were subjected to FNAC examination after fixing in 10% formalin. Histopathological examination was done and the results were correlated with the cytological reports to evaluate efficacy of the procedure. They were subjected to FNAC and only those thyroid swelling cases admitted to indoor and subsequently underwent surgery were included in this study. After HP study they were compared with preoperative FNAC report.

Result: During histo-pathological examination commonest cause of lymphadenopathy was tubercular lymphadenitis (29.1%) and metastatic carcinoma (27.7%). Reactive hyperplasia was (20.8%) at second place. Lymphomas constituted 18.0%. Granulomatous inflammatory lesion accounted for 4.16% of lymph node enlargement. Out of 72 cases, cytological diagnosis was matched with histopathological diagnosis in 66 cases.

Conclusion: Commonest cases of lymphadenopathy in children was reactive hyperplasia; in adult's tubercular lymphadenitis and lymphoma; while metastasis in older age. The commonest cause of metastasis in lymph node was squamous cell carcinoma. We have found FNAC a satisfactory tool in the diagnosis of tubercular and malignant lymphadenopathy.

Keywords: Lymphadenopathy, FNAC, Histopathology, Accuracy

INTRODUCTION

There are around 800 lymph nodes in the body and approximately 300 are present on the neck.¹ Enlargement of lymph node may result from the proliferation of lymphocytes intrinsic to lymph nodes, due to an infection or a lymphoproliferative disorder or from the migration and infiltration of nodal tissue by either intrinsic inflammatory cells or metastatic malignant cells.² Aspiration of lymph nodes for diagnostic purpose was reported as early as 1904 by

gueg and graywho used this procedure in the diagnosis of trypanosomiasis.^{3,4} Currently this technique is practiced worldwide and it is the investigation of choice in thyroid, lymphnodes and breast swellings. The limitation of FNAC includes false negative result and false positive results.⁵ had done a comparison study between FNAC and histopathology and then found that the accuracy and FNAC was 91.6%.⁶ had done similar study and founded that FNAC had a sensitivity (52.6%), specificity (86.6%) and accuracy (79.1%) for thyroid malignancy.⁷ Fine needle aspiration cytology (FNAC) has emerged as an advanced diagnostic tool to differentiate reactive hyperplasia / inflammatory conditions, granulomatous disorders and lymphomas. This diagnostic modality has gained considerable importance in the management of patients with lymphadenopathy over several years. We are reporting histo-pathological correlation of 200 cases of lymphadenopathy with FNAC. The results of FNAC compare favorably with those of tissue biopsies and in some situations the aspirate has qualities of a biopsy. Suspicious or doubtful situation should be resolved by surgical biopsy and further by immuno histochemistry and molecular studies wherever needed.⁸ The aim of the present study is to highlight the role of FNAC in the diagnosis of etiological profiles of lymphadenopathy and to find out the accuracy of FNAC in comparison to histopathological examination of a biopsy.

MATERIALS AND METHODS

This prospective study was done in our institute from a period of two years, on a sample size of 72 patients. The inclusion criteria were to include patients of various age, irrespective of their age having enlarged lymph node. Lymph node biopsies were received in 72 patients and the biopsy specimens were subjected to FNAC examination after fixing in 10% formalin. Histopathological examination was done and the results were correlated with the cytological reports to evaluate efficacy of the procedure. They were subjected to FNAC and only those thyroid swelling cases admitted to indoor and subsequently underwent surgery were included in this study. After HP study they were compared with preoperative FNAC report. Patient with other neck swellings were excluded from this study. In all 72 cases informed consent was taken prior to surgery. Ultrasonography of thyroid gland and thyroid hormone profile was done in all thyroid swelling. All cases of FNAC and specimen for HP study were sent to pathology Department of S.C.B. Medical College, Cuttack. The results of FNAC findings were compared and evaluated taking histopathology as the gold standard.

RESULTS

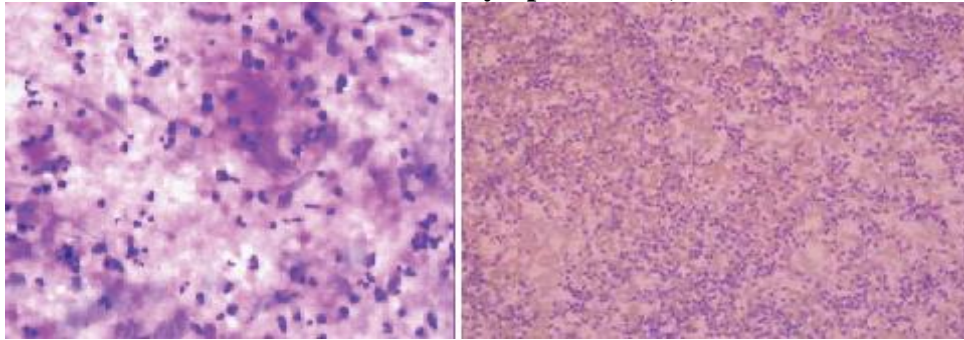
In the present study during histopathological examination commonest cause of lymphadenopathy were tubercular lymphnoditis (29.1%) and metastatic carcinoma (27.7%). Reactive hyperplasia was (20.8%) at second place. Lymphomas constituted 18.0%. Granulomatous inflammatory lesion accounted for 4.16% of lymph node enlargement. Out of 72 cases, cytological diagnosis was matched with histopathological diagnosis in 66 cases. Table 1 shows the Distribution of cases according to histopathological diagnosis. Table 2 shows the Co-relation between cytological diagnosis and final diagnosis.

Table 1: Distribution of Cases According to Histopathological Diagnosis

Histopathological Diagnosis	No of cases	Percentage (%)
Tubercular lymphnoditis	21	29.1%
Metastatic carcinoma	20	27.7 %
Reactive hyperplasia	15	20.8%
Lymphoma	13	18.0%
Granulomatous Inflammatory lesion	03	4.16 %
Total	72	100

Table 2: Co-relation between Cytological Diagnosis and Final Diagnosis.

Histopathological diagnosis		Cytological diagnosis				
		Tubercular lymph-noditis	Metastatic carcinoma	Reactive hyperplasia	Lymphoma	Granulomatous inflammation lesion
TB	21	21	-	-	-	-
Metastatic Ca	20	-	18	2	-	-
RH	15	-	-	15	-	-
Lymphoma	13	-	-	3	10	-
Granulomatous inflammatory lesion	3	-	-	-	-	3
Total	72	21	18	20	10	3

Figure 1: Metastatic carcinoma & Reactive lymphadenitis,

In the present study, commonest cause of metastasis in lymphnodes was squamous cell carcinoma. Maximum number of patients (50%) with tuberculosis presented with epithelioid granulomas with caseous necrosis, followed by epithelioid granulomas without necrosis (30%). Only caseous necrosis was found in 10 % of patients.

DISCUSSION

Etiological profile of the present study showed tubercular lymphnoditis (29.1%) and metastatic carcinoma (27.7%) as being commonest causes of lymphadenopathy followed by reactive hyperplasia (20.8%), lymphoma (18.0%) and granulomatous inflammatory lesion (4.16%). Cervical lymphadenopathy may be the initial finding or may arise later on with other symptoms. In the context of granulomatous disorders, the possible etiology is wide and the use of FNAC with other ancillary tests (microbiological, immunohistochemical, radiological, biochemical and special staining techniques) is useful for obtaining a definitive diagnosis. Lymphadenopathy often signifies the spectrum of other serious illnesses like lymphoma, acquired immunodeficiency syndrome, or metastatic cancer. FNAC as a first line screening method has been recommended in suspected malignancy.^{9, 10} Four out of six follicular adenoma of thyroid diagnosed by FNAC correlated correctly with their histopathological results whereas two cases were diagnosed to be follicular carcinoma by FNAC. Five cases of papillary carcinoma of thyroid were diagnosed correctly by FNAC. The overall diagnostic accuracy of thyroid swelling in this series was 96.05%. Our findings can be compared with observation of Frable and Frable¹¹ who reported diagnostic accuracy of FNAC was 94%. The importance of performing an FNAC in patients with cervical lymphadenopathy prior to an excisional biopsy helps to assess the diagnosis of metastatic

tumors of the head and neck. Furthermore, direct open biopsy prior to cytology may lead to a significantly higher local treatment failure rate, which in turn may be associated with an adverse effect on survival.^{12,13} The accuracy of FNAC in the diagnosis of lymphoma has previously been questioned.¹⁴ The factors that influence the diagnostic specificity and sensitivity of FNAC in the diagnosis of lymphoma include necrosis in involved nodes, the presence of dual pathology, and sclerosis/fibrosis in involved nodes leading to insufficient diagnostic material.^{15,16} In our study all the 20 cases (100%) diagnosed as tubercular lymphadenitis on FNAC proved to be same on histopathology. So, diagnostic accuracy, specificity, sensitivity and predictive value of positive test of FNAC in the diagnosis of tuberculosis was 100 % similar to other studies.^[15,16] In our study metastatic carcinoma was commonly (70%) noted in 41-70 years of age group with an overall frequency of malignancy was found to be higher in males. The cervical lymph nodes were most commonly involved in metastasis similar to previous study results.¹⁷⁻²⁰ The specificity was 100 %; sensitivity 90% and predictive value of a positive test was 100% in the diagnostic accuracy of cytological diagnosis in cases of metastatic carcinoma as compared to previous study.²¹⁻²⁵ Overall clinical diagnosis with final diagnosis after relevant investigations correlated in 82.3% of cases, while the cytological and histopathological diagnosis was same in 94.1% of cases.

CONCLUSION

Commonest cases of lymphadenopathy in children was reactive hyperplasia; in adults tubercular lymphadenitis and lymphoma; while metastasis in older age. The commonest cause of metastasis in lymph node was squamous cell carcinoma. We have found FNAC a satisfactory tool in the diagnosis of tubercular and malignant lymphadenopathy. The simplicity and rapidity of the procedure make it most suitable for use on outpatient basis even in peripheral hospitals and dispensaries. FNAC used in conjunction with clinical findings, radiological and laboratory investigations can be a cost effective method for the diagnosis of lymphadenopathy.

REFERENCES

1. Howard D J, Lund V J. Pharynx, Larynx and neck. In: Williams N.S, Bulstrode C J K, O'Connell P R, editors. Bailey and Love's Short Practice of Surgery. 25th ed. London: Edward Arnold (Publishers) Ltd; 2008; 702-33.
2. Twist C J, Link M P: assessment of lymphadenopathy in children. *Pediatr Clin North Am* 2002; 49:1009-1025.
3. Guthrie C.G. Gland punctures as a diagnostic measure. *Bull. Johns Hopkins Hosp.* 1921, 32,266.
4. R.K., S. radhan, Singh R.P. And Chaturvedi S. Palace of fine needle aspiration cytology in the diagnosis of lymphadenopathy. *Ind. J. Tub.*, 1990, 37, 29.
5. Bloch M (1997) Fine needle aspiration biopsy of head & neck masses. *Otolaryngol Head Neck Surg* 89:62-68
6. Mundasad B, Mcallidter I, Carson J (2006) Accuracy of fine needle aspiration cytology in diagnosis of thyroid swelling. *Internet J Endocrinol* 2(2):23-25.
7. Handa U, Garg S, Mohan H (2008) Role of fine needle aspiration cytology in diagnosis and management of thyroid lesion. *Indian J Pediatr* 25(1):13-17.
8. Advani S K, Aqil S, Das J R, Dahar A. Role of Fine Needle Aspiration Cytology in the cervical lymphadenopathy. *Pak J Otolaryngol.* 2008; 24(3): 42-4.
9. Blackshaw A. Metastatic tumour in lymph nodes. In: Standfield AG, D'Ardenne, editors. *Lymph node biopsy interpretation.* London: Churchill Livingstone, 1987: 380-397.
10. Coyne JD, Banerjee SS, Menasche LP, Mene A. Granulomatous lymphadenitis associated with metastatic malignant melanoma. *Histopathol.* 1996; 28(5):470-2.

11. Frable. WJ, Frable MAS (1979) thin needle aspiration biopsy: the diagnosis of head & neck tumors revisited. *Otolaryngol Pol* 43: 1541–1548.
12. Lefebvre JL, Coche-Dequeant B, Van JT, Buisset E, Adenis A. Cervical lymph nodes from an unknown primary tumor in 190 patients. *Is J Surg*. 1990; 160:443-6.
13. Janot F, Klijanienko J, Russo A, Mamet JP, de Braud F, El-Naggar AK, et al. Prognostic value of clinicopathologic parameters in head and neck squamous cell carcinoma: A prospective analysis. *Br J Cancer*. 1996; 73:531-8.
14. Gupta RK, Naran S, Lallu S, Fauck R. The diagnostic value of fine needle aspiration cytology (FNCA) in the assessment of palpable supraclavicular lymph nodes: A study of 218 cases. *Cytopathology*. 2003; 14:201-7.
15. Morris-Stiff G, Cheang P, Key S, Verghese A, Havard TJ. Does the surgeon still have a role to play in the diagnosis and management of lymphomas? *World J Surg Oncol*. 2008; 6:13.
16. Dong HY, Harris NL, Preffer FI, Pitman BP. Fine needle aspiration biopsy in the diagnosis and classification of primary and recurrent lymphoma: A retrospective analysis of the utility of cytomorphology and flow cytometry. *Mod Pathol*. 2001; 14:472-81.
17. Engzell U, Jakobsson P.A., Sigurdson A, Zajicek J; Aspiration biopsy of metastatic carcinoma in lymph nodes of the neck; *Acta Otolaryngol*. 72(1):138-147, 1971.
18. Betsill William L and Hajdu Steven I; Percutaneous aspiration biopsy of lymph nodes; *A.J.C.P.* 1980; 73(4):471-479.
19. Haque MA, Talukder SI. Evaluation of fine needle aspiration cytology (FNAC) of lymph node in Mymensingh, *Mymensing Med J*. 2003; 12:33-35
20. Alam K., Maheeshwari V, Haider N, Siddiqui F, Jain A & Khan A: Fine Needle Aspiration Cytology (FNAC), a handy tool for metastatic lymphadenopathy. *The internet Journal of Pathology*. 2010; 10(2).
21. Tariq Ahmed, Mohammad Naeem, Siddique Ahmad, Ambreen Samad. Fine Needle Aspiration Cytology (FNAC) and Neck Swellings in the Surgical Outpatient. *J Ayub Med Coll Abbottabad*. 2008; 20(3):30-32.
22. Lee Robert E, Valaitis J. Kalis O; Lymph node examination by fine needle aspiration in patients with known or suspected malignancy. *Act Cytologica* 1987; 31(5):563-572.
23. Narang R.K., S. Pradhan, Singh R.P. And Chaturvedi S. Palace of fine needle aspiration cytology in the diagnosis of lymphadenopathy. *Ind. J. Tub*. 1990, 37, 29.
24. Prasad R, Garg S.K., Mukerji P.K. and Agarwal P K: Role of fine needle aspiration cytology in the diagnosis of lymphadenopathy. *Indian J. Chest dis Allied sci*. 1993; 35, 1, (27-29).
25. Nada al Alwan, Al Hashimi AS, Salman MM, Al Attar EA. Fine needle aspiration cytology versus histopathology in diagnosing lymph node lesion. *Eastern Mediterranean Health Journal*. 1996; 2:320-325.