

COMPARISON OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) AND EXCISION BIOPSY IN THE DIAGNOSIS OF CERVICAL LYMPHADENOPATHY

NAEEM AHMED, SAIMA ISRAR, MUHAMMAD SAJJAD ASHRAF*

Department of Surgery, Baqai Medical University, Karachi
Senior Registrar, Surgical Unit I, Civil Hospital, Karachi*

ABSTRACT

Objective: To evaluate the accuracy of Fine Needle Aspiration Cytology as compared to excision biopsy in the diagnosis cervical lymphadenopathy.

Study Design: Prospective study.

Setting & Duration: Department of Surgery, Baqai Medical University from January to December 2005.

Methodology: After taking informed consent patients with enlarge cervical lymph nodes were included in the study. All patients undergone both FNAC and excision biopsy. Both specimens were send separately to Cytology and Histopathology units of one laboratory. Both units of laboratory work separately and neither of them were told about the reports of the other.

Results: Total 50 patients were included in the study which included 15(30%) males and 35(70%) females with a mean age of 28.7 years. In 48(96%) patients cytology report was conclusive and only 2(4%) patients it was inconclusive because of insufficient material. Out of 48 cytology reports, 37 cases were diagnosed as benign and none of them proved negative on histopathology, while 11 patients were diagnosed as malignant on cytology and two of them proved benign on histopathology. Sensitivity of FNAC was thus 95.8%, Specificity was 100% and Accuracy was 93.0%. Tuberculosis was the most common disease found in 34 (68%) patients followed by metastatic carcinoma in 6(12%) patients.

Conclusion: FNAC is a very simple yet accurate technique for the diagnosis of cervical lymphadenopathy.

KEYWORDS: Cervical Lymphadenopathy, FNAC, Biopsy, Tuberculosis

INTRODUCTION

There are approximately 800 lymph nodes in the body and no fewer than 300 of them lie in the neck.¹ Lymphadenopathy is an abnormal increase in size and/or altered consistency of lymph nodes. It is a clinical manifestation of regional or systemic disease and serves as an excellent clue to the underlying disease.² Cervical lymphadenopathy can arise either from benign or malignant causes.² The frequency of various etiological

processes for lymph node enlargement varies with geographical condition and socio-economical set up.² For assessment of cervical lymphadenopathy, different modalities are used which includes Fine Needle Aspiration Cytology, automatic core needle biopsy, flow cytometry, radiologically guided core needle biopsy and open biopsy.³⁻⁶

Fine-needle aspiration cytology (FNAC) is an easy, quick, inexpensive technique for diagnosing enlarge lymph nodes with a high degree of accuracy.⁷ The reported diagnostic accuracy of FNAC in malignant lymphadenopathy ranges from 79% to 94.5%^{8,9} but limitations of FNAC include a high rate of nondiagnostic sampling, high rate of false-negative diagnoses in Hodgkin disease, and incomplete classification of non-Hodgkin lymphoma.^{10,11} When FNAC for unexplained cervical lymphadenopathy results in a non-diagnostic or an equivocal report, open biopsy is frequently performed as the second step in reaching the diagnosis.

Correspondence:

Dr. Naeem Ahmed

Department of Surgery,

Baqai Medical University, Karachi.

Phones: 0300-2533958.

E-mail: naeemahmeddr@yahoo.com

The advantage of open biopsy is that it nearly always provides a tissue sample sufficient for the diagnosis. However, there are several disadvantages like being highly invasive, increased risk of infection, damage to nervous and vascular structures and unfavorable scarring. Open biopsy also adds costs (because the procedure requires use of an operation theatre), delays diagnosis and treatment (because the operation theatre must be scheduled in advance), and carries the risks inherent in sedation or general anesthesia. Moreover, open biopsy carries a known risk of seeding tumor and can violate a future surgical field, making definitive surgical treatment more difficult.^{3,4}

This study was done to evaluate the accuracy of FNAC in enlarge cervical lymph nodes and to establish its reliability as a sole diagnostic procedure by comparing its results with the excision biopsy.

METHODOLOGY

This double blind prospective study was carried out in Department of Surgery, Baqai Medical University from January to December 2005. After taking informed consent patients with enlarge cervical lymph nodes were included in the study. Patients with thyroid, salivary gland or any other neck swelling apart from lymph node were excluded. Also on aspiration, if pus was found, it was sent for culture and sensitivity and patients were excluded. All patients undergone both FNAC and excision biopsy.

Both specimen, that is smear for cytology (preserved in 90% Alcohol) and excised lymph node for histology (preserved in Formalin) were send separately to Cytology and Histopathology units of one laboratory. Both units of laboratory work separately and neither of them were told about the reports of the other.

RESULTS

Total 50 patients were included in the study which included 15(30%) males and 35(70%) females with a mean age of 28.7 years. Apart from cervical swellings the most common associated symptoms were fever in 22(44%), cough in 16(32%), weight loss in 15(30%) and painful swelling in 10(20%) patients while 16 (32%) were without any symptom apart from cervical swelling. Duration of nodal enlargement at the time of presentation was 1-18 months with median of 2.5 months.

In 48(96%) patients cytology report was conclusive and only 2(4%) patients it was inconclusive because of insufficient material. It means there were 2 false negative. Out of 48 cytology reports, 37 cases were diagnosed

as benign and none of them proved negative on histopathology, while 11 patients were diagnosed as malignant on cytology and two of them proved benign on histopathology. Sensitivity of FNAC was thus 95.8%, Specificity was 100% and Accuracy was 93.0%. Tuberculosis was the most common disease found in 34(68%) patients, metastatic carcinoma in 6(12%), non-Hodgkin lymphoma 3(6%), Hodgkins disease 2(4%) and Reactive Hyperpalsia in 3(6%) patients.

No complication was observed after FNAC. After biopsy, two patients formed sinuses and three suffered from wound infection. No bleeding or nerve injury occurred.

DISCUSSION

Our results showed that FNAC can be used as sole diagnostic modality in majority of cases of cervical lymphadenopathy because all diagnosis reached by cytology were confirmed on histology; i.e. the gold standard. The same observation was reported by Poddar.¹² where all FNAC done on cervical lymph nodes were accurate when compared by histopathology.

Prasad¹³ reported an analysis of FNAC on 2,418 cases of superficial lymphadenopathy over five years. The FNAC findings were correlated with subsequent histopathological diagnosis in 1,041 cases. The sensitivity rates of FNAC in tuberculosis, metastatic tumors, Hodgkin's disease, and non-Hodgkin's lymphoma were found to be 83.3, 97, 30, and 80.3% respectively, the specificity being 94.3, 98.9, 98.6, and 95.4% respectively. Immunocytochemical tests performed on the aspirated material helped in classifying the metastatic poorly differentiated tumors and confirming the diagnosis of non-Hodgkin's lymphomas. They concluded that FNAC is a simple, inexpensive procedure, and when complemented by appropriate immunocytochemical studies is accurate and reliable for routine diagnosis of lymphadenopathy.¹³ Advani¹⁴ evaluated the accuracy and efficacy of fine needle aspiration cytology (FNAC) in the cervical lymphadenopathy in 35 patients. Their study showed that over all sensitivity were 87.5%, specificity 90.0% and accuracy 91.4%. These all studies confirmed our findings that FNAC is reliable, safe and accurate test as a first line of evaluation in cervical lymphadenopathy, it could differentiate the infective process from malignant one and avoids unnecessary surgeries.

In this study with a benign lesions of 74% that is 37 out of 50 patients, and all histology-proven (no false positive), the most common disease (68%) of cervical lymphadenopathy was tuberculosis. With such endemic background of TB in our region, one can rely entirely upon FNAC for screening for TB. Other studies from

the region showed that TB being one of the commonest disease which becoming rare in the developed world.^{12,15} When clinical history suggests tuberculosis, there is always concerns about doing excision biopsy because of chances of sinus formation. Many authors proved that TB can readily be diagnosed by doing FNAC and Excision Biopsy should be employed as second line investigation if results of FNAC are negative.¹⁶ A recent study from India showed that Tubercular cervical lymphadenitis can readily be diagnosed by fine needle aspiration cytology, a simple and cost-effective test. The disease can be cured completely by a short course of anti-tubercular chemotherapy, without surgical intervention.¹⁷

If the disease is very rare and or very lethal, early detection markedly improves prognosis, so high sensitivity is necessary. The cancers generally are such examples, in which false positive results are tolerable but false negative results are not tolerable. Thus for suspicious cases of malignancy with substantial amount of clinical evidence and when cytology turned out to be malignant, the FNAC should not be used as sole diagnostic test because in the hands of poorly qualified examiners it may lead to major errors of diagnosis with grave harm to the patient. Because FNAC can be performed quickly and cost efficiently with minimal discomfort to patients, this procedure is widely accepted as the first step in examining most head and neck masses like lymph nodes. Indeed, for most patients, FNAC provides the diagnosis and leads to appropriate treatment. However, FNAC has important limitations. First it requires an experienced cytologist for interpretation of the slides. Second the process of making cytologic smears of the aspirate precludes histologic inspection of cell architecture, complete immunohistochemical analysis of the aspirate is not possible. Use of FNAC to diagnose lymphoma or for typing undifferentiated carcinoma therefore presents a challenge and in these cases FNAC should be followed by excision biopsy.

CONCLUSION

FNAC is a very simple yet accurate technique for the diagnosis of cervical lymphadenopathy. It should be recommended as first line and Excision Biopsy as second line investigation if results of FNAC are negative.

REFERENCES

- 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.
- Malik G A, Rehan T M, Bhatti S Z. Relative frequency of different diseases in patients with Lymphadenopathy. *Pak J Surg* 2003; 19(2): 86-9.
- Nyquist G G, Tom W D, Mui S. Automatic Core Needle Biopsy: A Diagnostic Option for Head and Neck Masses. *Arch Otolaryngol Head Neck Surg*. 2008; 134(2): 184-9.
- Kim B M, Kim E K, Kim M J, Yang W, Park C S, Park S. Sonographically Guided Core Needle Biopsy of Cervical Lymphadenopathy in Patients Without Known Malignancy. *J Ultrasound Med* 2007; 26: 585-91.
- Abdullah P, Mubarik A, Zahir N. The Importance of Lymph Node Biopsy in Diagnosis of Lymphadenopathy. *J Coll Physicians Surg Pak* 2000; 10(8): 298-301.
- Cannon C R, Richardson L D. Value of flow cytometry in the evaluation of head and neck fine-needle lymphoid aspirates: a 3-year retrospective review of a community-based practice. *Otolaryngol Head Neck Surg* 2001; 124(5): 544-8.
- Wakely P E Jr, Kneisl J S. Soft tissue aspiration cytopathology. *Cancer* 2000; 90(5): 292-8.
- Takes R P, Righi P, Meeuwis C A. The values of ultrasound with ultrasound-guided fine-needle aspiration biopsy compared to computed tomography in the detection of regional metastases in the clinically negative neck. *Int J Radiat Oncol Biol Phys* 1998; 15: 1027-32.
- Knappe M, Louw M, Gregor R T. Ultrasonography-guided fine-needle aspiration for the assessment of cervical metastases. *Arch Otolaryngol Head Neck Surg* 2000; 126: 1091-6.
- Kline T S, Kannan V, Kline I K. Lymphadenopathy and aspiration biopsy cytology: review of 376 superficial nodes. *Cancer* 1984; 54: 1076-81.
- Lioe T F, Elliott H, Allen D C, Spence R A. The role of fine needle aspiration cytology (FNAC) in the investigation of superficial lymphadenopathy: uses and limitations of the technique. *Cytopathology* 1999; 10: 291-7.
- Poddar A K, Saha P, Ghosh J L, De N C, Chakraborti B N, Ghosh R N. Cervical lymphadenopathy: a comparative study of results of FNAC and histopathology. *Indian J Tuberculosis* 1992; 39(2): 128.

13. Prasad R R A, Narasimhan, Sankaran V, Veliath A J. Fine-needle aspiration cytology in the diagnosis of superficial lymphadenopathy: An analysis of 2,418 cases. *Diagn Cytopathol* 1996; 15: 382-6.
14. Advani S K, Aqil S, Das J R, Dahar A. Role of Fine Needle Aspiration Cytology (FNAC) in the Cervical Lymphadenopathy. *Pak J Otolaryngol* 2008; 24(3): 42-4.
15. Ashfaq M, Ahmad N, Ullah I, Iqbal M J. Cervical lymphadenopathy: diagnostic approach. *J Postgrad Med Inst* 2006; 20(4): 374-8.
16. Farooq A, Ameen I. Comparison of FNAC vs Excision Biopsy for suspected Tuberculous Cervical Lymphadenopathy. *Ann King Edward Med Coll* 2003; 9(3): 216-8.
17. Khan R, Harris S H, Verma A K, Syed A. Cervical lymphadenopathy: scrofula revisited. *J Laryngology Otology* 2008; 1-4.