



Comparison of fine needle aspiration cytology and histopathology in diagnosing cervical lymphadenopathies

Adhikari P, Sinha BK, Baskota DK

Department of ENT and Head and Neck Surgery, GMS Memorial Academy of ENT and Head and Neck Studies, TU Teaching Hospital, Kathmandu, Nepal

RESEARCH

Please cite this paper as: Adhikari P, Sinha BK, Baskota DK. Comparison of fine needle aspiration cytology and histopathology in diagnosing cervical lymphadenopathies. AMJ 2011, 4, 2, 97-99.

Doi: <http://doi.org/10.21767/AMJ.2011.559>

Corresponding Author:

Dr. Prakash Adhikari

Address: GMS Memorial Academy of ENT and Head and Neck Studies, TU Teaching Hospital, Kathmandu, Nepal. Email: drprakashadhikari@hotmail.com

Abstract

Background

Lymphadenopathies are the most common form of extrapulmonary tuberculosis and tuberculous lymphadenitis is the most common cause of peripheral lymphadenopathy in a developing country like Nepal. The objective of this study is to compare the findings of fine needle aspiration cytology to histopathology in diagnosing cervical lymphadenopathies.

Method

This is a prospective, longitudinal, comparative study was performed in the Department of ENT and Head and Neck Surgery, TU Teaching Hospital, Kathmandu between August 2007 and January 2009. Patients 13 years of age or older were included. There were 55 patients with cervical lymphadenopathies subjected to both fine needle aspiration cytology (FNAC) and histopathology (HPE). The sensitivity, specificity, false positive, false negative, positive predictive value and negative predictive value were calculated.

Results

Of 55 patients, 48 patients had lymphadenopathies of infective origin while 7 patients had metastatic disease. Majority of patients (n=20) were in age group 23-32 years and males outnumbered females. The sensitivity, specificity, false positive, false negative, positive predictive value and

negative predictive value of FNAC of lymphadenopathies to diagnose tubercular lymphadenopathies were 80.0%, 100.0%, 0.0%, 20.0%, 100.0% and 82.14% respectively. Similarly, sensitivity, specificity of FNAC of lymphadenopathies to differentiate benign and malignant lesion were 100% each. False positive, false negative, positive predictive value and negative predictive value were 0.0%, 0.0%, 100.0% and 100.0% respectively. Overall correlation of FNAC and HPE was 90.9%.

Conclusion

FNAC can distinguish tubercular lymphadenitis from reactive and granulomatous lymphadenitis in majority of cases. Similarly, it can distinguish well between benign and malignant lymphadenopathies. It can be used as an initial investigation for routine screening of cervical lymphadenopathies where facilities of histopathology are not available.

Key Words

Fine needle aspiration cytology; histopathology; cervical lymphadenopathies.

Background

Fine needle aspiration cytology (FNAC) is of particular relevance in the head and neck area, because of the easy accessibility of target sites. FNAC in this region is easy because of excellent patient compliance, due to the minimally invasive nature of the technique and the important aspect of avoidance of surgery in situations like non neoplastic or inflammatory conditions and metastatic tumours^[1]. FNAC also affords a practicable and means of rationally planning surgery.

Routine use of FNAC can help us to diagnose the types of lymphadenopathies pre-operatively and we can proceed ahead accordingly. It can be done in places where facilities of histopathology are not available. The objective of this study is to compare the findings of fine needle aspiration cytology and histopathology in diagnosing cervical lymphadenopathies.



Method

This is a prospective, longitudinal, comparative study done in the Department of ENT and Head and Neck Surgery, TU Teaching Hospital, Kathmandu between January 2007 and January 2009. Patients more or equal to 13 years of both genders were included. Patients with missing FNAC reports or those cases who could not undergo biopsy were excluded. There were 55 patients with cervical lymphadenopathies subjected to both fine needle aspiration cytology (FNAC) and histopathology (HPE). All the slides were reviewed by the senior pathologist. The pathologist was unknown about the FNAC results while doing the HPE. The sensitivity, specificity, false positive, false negative, positive predictive value and negative predictive value were calculated.

Consent was taken from all patients for the study and ethical approval was obtained from the Institution Review Board.

Results

During a period of 18 months, there were 55 patients who underwent FNAC and HPE. There were 30 males and 25 females. Majority of patients were in age group 23 – 32 years followed by 13 – 22 years and 33 – 42 years (Table.1).

The sensitivity, specificity, false positive, false negative, positive predictive value and negative predictive value of FNAC of lymphadenopathies to diagnose tubercular lymphadenopathies were 80.0%, 100.0%, 0.0%, 20.0%, 100.0% and 82.14% respectively. Similarly, sensitivity, specificity of FNAC of lymphadenopathies to differentiate benign and malignant lesion were 100% each. False positive, false negative, positive predictive value and negative predictive value were 0.0%, 0.0%, 100.0% and 100.0% respectively. Most common correlation between FNAC and HPE were seen in reactive and granulomatous lymphadenopathies. There were 5 patients (9.1%) in which there was no correlation between FNAC and HPE. FNAC revealed granulomatous lymphadenitis in these 5 patients whereas HPE revealed tuberculous lymphadenitis. Overall correlation of FNAC and HPE was 90.9% (Table.2).

Table: 1. Age distribution of cervical lymphadenopathies

| Age group of the patients | Gender | | Total patients | Percentage |
|---------------------------|--------|--------|----------------|------------|
| | Male | Female | | |
| 13-22 years | 6 | 5 | 11 | 20.0% |
| 23-32 years | 11 | 9 | 20 | 36.4% |
| 33-42 years | 6 | 4 | 10 | 18.2% |
| 43-52 years | 3 | 4 | 7 | 12.7% |
| 53-62 years | 2 | 2 | 4 | 7.3% |
| More than 62 years | 2 | 1 | 3 | 5.4% |
| Total patients | 30 | 25 | 55 | 100.0% |

Table: 2. Lymphadenopathy correlation

| Histological diagnosis | Total number of patients | FNAC correlating with HPE | FNAC not correlating with HPE (%) |
|---------------------------------|--------------------------|---------------------------|-----------------------------------|
| Tuberculous Lymphadenopathies | 25 | 20 | 5 (9.1%) |
| Granulomatous Lymphadenopathies | 14 | 14 | 0 |
| Reactive Lymphadenopathies | 9 | 9 | 0 |
| Metastatic Lymphadenopathies | 7 | 7 | 0 |
| Total patients | 55 (100%) | 50 (90.9%) | 5 (9.1%) |

Discussion

In our Department of TU Teaching Hospital, neck masses are most common presentation in head and neck unit. The most common of non-thyroidal neck swellings in descending order of frequencies in our hospital are: lymphadenopathies, salivary gland tumours, cystic lesions, metastasis, neurogenic tumours. Therefore, the accurate diagnosis of the nature of a neck swelling is of paramount importance.

Lymphadenopathy is a symptom which frequently presents in primary care settings and affects patients of all ages [2]. Although the observation of lymph node enlargement sometimes raises fears about serious illness, it usually results from benign infectious causes. The fear arises due to the spectra of causes which include microbial, hematological, neoplastic, and connective tissue disorders [3]. Several studies on peripheral lymphadenopathy in various countries have shown that cervical lymph nodes are the most frequently enlarged and biopsied of all peripheral lymph nodes [4-6].

The knowledge of the pattern of lymphadenopathy in a given geographical region is essential for making a confident diagnosis or suspecting a disease. Tuberculosis is the commonest cause of lymphadenopathy in developing countries like Nepal and India and should be considered in every case of granulomatous lymphadenopathy unless proved otherwise. Majority of patients in this study in cases of lymphadenitis of different origin were in age group 23 – 32 years followed by 13 – 22 years and 33 – 42 years. These findings correlated with studies done by Pandit et al who also reported majority of cases belonged to age group 21 – 40 years [4]. Malignant metastases to cervical lymph node also were seen mostly in older age group [4].

Khiery and Ahmed study [7] revealed that majority of lymph nodes were benign in origin and most common is tuberculous lymphadenitis followed by reactive lymphadenitis and granulomatous lymphadenitis which is similar to our study. The calculated sensitivity rate in different studies is from 81% to 92% [3, 6, 8, 9]. Specificity



varies from 86% to 98.9% [3, 6, 8, 9]. The calculated accuracy is from 84% to 94.3% [3, 6]. In our study, the sensitivity and specificity of FNAC of lymphadenopathy to diagnose tubercular lymphadenopathy were 80.0% and 100.0%. Similarly, false positive value false negative value positive predictive value and negative predictive value were 0.00%, 20.0%, 100.0% and 82.14% respectively.

According to Haque et al study, FNAC diagnosis was found to be as follows: granulomatous inflammation 46 (40.35%), reactive hyperplasia 31 (27.19%), metastatic carcinoma 20 (17.54%), Non-Hodgkin's lymphoma 6(5.26%), tubercular lymphadenitis 4(3.51%), acute non-specific lymphadenitis 3(2.63%), Hodgkin's lymphoma 3(2.63%) and chronic non-specific lymphadenitis 1(0.88%) [10].

FNAC has been highly accurate in the diagnosis of metastatic carcinoma of the lymph node. In our study, there were only seven cases of metastatic lymph nodes which were diagnosed as metastatic carcinoma, both in fine needle aspiration cytology and histopathology, which correlated with Pandit et al study [4]. There were no cases of primary malignancies in our study.

We have found FNAC as a satisfactory tool in the diagnosis of tubercular and malignant lymphadenopathy. The simplicity and cost-effectiveness of the procedure make it most suitable for use on outpatient basis even in peripheral hospitals and dispensaries.

The gold-standard procedure for the diagnosis of a neck mass is open biopsy of the mass with histological examination of the excised tissue [11]. However, open biopsy of a metastatic cervical mass prior to definitive treatment of the neck (usually by radical neck dissection) in patients with metastatic cervical carcinoma has been reported to lead to a higher incidence of wound complications, regional neck recurrence and distant metastases, than in patients who have no biopsy performed prior to definitive treatment [12].

FNAC for head and neck masses has several limitations. Failure to establish an accurate diagnosis may be because of sampling error. In these circumstances, repeat aspiration is suggested, and excisional biopsy may be considered. Personnel responsible for handling, processing (experienced cytotechnologist), and interpreting (cytopathologist) FNAC samples must be well trained. Interobserver variability must be minimized.

Conclusion

FNAC can distinguish tubercular lymphadenitis from reactive and granulomatous lymphadenitis in majority of cases. Similarly, it can distinguish well between benign and malignant lymphadenopathies. It can be used as an initial investigation for routine screening of cervical lymphadenopathies where facilities of histopathology are not available.

References

1. Abrari A, Ahmad S S, Bakshi V. Cytology in the otolaryngologist's domain- a study of 150 cases, emphasizing diagnostic utility and pitfalls. *Indian J Otolaryngol Head Neck Surg* 2002; 54(2):107-10.
2. Young JE, Archibald SD, Shier KJ. Needle aspiration cytologic biopsy in head and neck masses. *Am J Surg* 1981; 142(4):484-9.
3. Mahbod G, Koasri F, Tafreshi MA. Fine needle aspiration cytology in diagnosis of nonthyroidal neck masses. *Acta Medica Iranica* 2002; 40(1):49-51.
4. Pandit AA, Candes FB, Khubchandhani SR. Fine needle aspiration cytology of lymph nodes. *J Postgrad Med* 1987; 33(3):134-6.
5. Carroll CM, Nazeer U, Timon CI. The accuracy of fine –needle aspiration biopsy in the diagnosis of head and neck masses. *Ir J Med sci* 1998; 167(3):149-51.
6. Bardales RH, Baker SJ, Mukunyadzi P. Fine– needle aspiration cytology findings in 214 cases of nonparotid lesion of the head. *Diagn cytopathol* 2000; 22(4):211-7.
7. Khiery J, Ahmed ME. Cervical lymphadenopathy in Khartoum. *J Trop Med Hyg* 1992;95(6):416-9.
8. AL-Khafaji BM, Nestok BR, Katz RL. Fine needle aspiration of 154 parotid masses with histologic correlation: Ten –year experience at the university of Texas M.D. Anderson cancer center. *Cancer* 1998; 84(3):153-9.
9. Djupesland P, Sauer T, Ferng A. Puncture cytology in tumours of the head and neck region. *Tidsskr Nor Laegeforen* 1993; 113(16):1985-7.
10. Haque MA, Talukder SI. Evaluation of fine needle aspiration cytology (FNAC) of lymph node in Mymensingh. *Mymensingh Med J* 2003; 12(1):33-5.
11. Patt BS, Schaefer SD, Vuitch F. Role of fine-needle aspiration in the evaluation of neck masses. *Med Clin North Am* 1993; 77(3):611-23.
12. McGuirt WF, McCabe BF. Significance of node biopsy before definitive treatment of cervical metastatic carcinoma. *Laryngoscope* 1978; 88(4):594-7.

ACKNOWLEDGEMENTS

We would like to acknowledge the patients who gave consent for this study and the hospital authority for giving the ethical approval to conduct the study. We are grateful to Professor Gita Sayami, Head of Pathology Department, for helping to conduct this study.

PEER REVIEW

Not commissioned. Externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.