

Diagnostic Evaluation of Fine Needle Aspiration Biopsy in Lung Cancer

1. Nadeem Anwar 2. Arshad Mehmood

1. Assoc. Prof. Pulmonologist Dept. 2. Assoc. Prof. of Surgery, Bolan Medical College, Quetta.

ABSTRACT

Objective: To evaluate the yield of Fine Needle Aspiration Cytology (FNAC) in suspected lung cancer.

Study Design: Observational Study

Place and Duration of Study: This study was conducted at the Department of Pulmonology, Bolan Medical College Quetta from Jan 2009 to Aug 2009.

Materials and Methods: Thirty Cases both male and female were included in the study. The lesion was localized with recent PA and Lateral Chest X-Rays and ultra sound. A 22 gauge needle was attached to 10cc syringe. The needle was introduced into the lesion under local anaesthesia. On reaching the mass slight suction was applied and few in and out movements were made, the needle was taken out and 3-4 slides were made of the aspirate, fixed immediately with alcohol.

Results: Among thirty cases, malignancy was proved in 21 cases while in 3 cases FNAC was positive for malignancy but no call type was revealed. In six cases malignancy was not found. Among proven 21 cases 14 had squamous cell carcinoma, 6 had Adeno carcinoma and one had small cell carcinoma.

Conclusion: FNAC of the peripheral lung lesions is a safe, quick and reliable method of establishing diagnosis of lung cancers where bronchoscopic help is not available or the tumor is not within reach of bronchoscope.

Key Words: Fine needle aspiration cytology (FNAC) Pneumothorax (PTX).

INTRODUCTION

Bronchogenic carcinoma is the most commonly diagnosed malignancy through out the world^{1,2}.

Different studies conducted in Pakistan show that malignancies of the lungs are common among males in Pakistan³⁻⁶.

Fine needle aspiration is widely used technique⁷. Percutaneous FNAC/B of the lung has been used in the diagnosis of chest diseases over a century. The first reported aspiration lung biopsy was performed in 1883 by Lyden and three years later, Menetrier was the first to diagnose lung carcinoma by FNA⁸.

About 80% of lung cancer are visible on bronchoscopy, which is indicated in most patients in whom diagnosis is suspected. Peripheral lung cancers are not visible at bronchoscopy and fine needle aspiration cytology/biopsy can be done for confirmation of diagnosis⁹. FNAC allows a minimally Invasive, rapid diagnosis of tissue but does not preserve its histological architecture¹⁰.

MATERIALS AND METHODS

This study was conducted in The Plumonology Department Bolan Medical Collage Quetta. Thirty patients were included in this study who were suspected to be suffering from lung cancer on clinical and radiological basis. Prior to FNAC all the cases underwent fiberoptic bronchoscopic examinations. The lesion was localized with recent PA and lateral chest radiograph and lateral chest radiograph and ultrasonographically. A 22 gauge needle was used and it

was attached to 10 cc of syringe. The needle was introduced into the lesion under local anaesthesia. On reaching the mass, Slide suction was applied and few in and out movements were made, the needle was taken out and 3-4 slides were made of the aspirate. Which were fixed immediately with alcohol and send to pathology laboratory for cytological examination.

RESULTS

Age and sex distribution is shown in table 1. The highest incidence was observed in the 4th and 5th decades. Among the 30 cases 26 (87%) were males and 4(13%) were females. The male to female ratio was 6:5:1.

Table No.1: Age and Sex Distribution

Age	Male	Female	Total	Percentage
31-40	2	---	2	6.66
41-50	6	1	7	23.33
51-60	9	2	11	36.66
61-70	7	1	8	26.66
71-80	2	---	2	6.66
Total	26	4	30	
%age	87	13	100	100

Table No.2: Presenting Complaints 30 cases

Symptoms	No. of Patients	Percentage
Cough	25	82%
Chest Pain	20	67%
Haemoptysis	18	60%
Weight Loss	15	50%
Fever	13	43%
Expectoration	12	40%
SVCO	2	6%
Anorexia	2	6%

In present study the commonest presenting symptom was cough in 25 (83%) cases followed by chest pain in 20 (67%) cases. Other symptoms according to frequency of occurrence are shown in Table 2.

Malignancy was confirmed in 21 (70%) cases and in 3 (10%) cases there was suspicion of some underlying malignancy, and no diagnosis could be made in 6 (20%) cases.

Table No.3: Diagnostic Yield of FNAC

Diagnosis Made	No. of Cases	%age
Malignancy Confirmed	21	70%
Suspicion of Malignancy	3	10%
No Diagnosis	6	20%
Total	30	100%

Out of these 21 (70% Malignancy proven case 14 (66.6%) had squamous cells carcinoma. 6 patients (28.6%) had adenocarcinoma while one patient (5.8%) had small cell carcinoma.

Table No.4: Cytological Typing of Malignancy

No. of Patients	Percentage	Malignancy
14	66.6	Sq. Cell CA
06	8.6	Adeno CA
1	5.8	Small Cell CA
Total	21	100%

Table No.5: Complications of FNAC

No. of Cases	Percentage	Complication
3	10%	PTX
4	13%	Chest Pain

DISCUSSION

Bronchogenic carcinoma is the most common malignant tumour. This is the leading cause of cancer deaths in men and women. Thirty five thousand people die each year from lung cancer with a male to female ratio of 3:5:1 in U.K¹¹.

The incidence of lung cancer is between age fifty five and sixty five years¹². In the Present study the highest incidence was observed in the age group from 50-70 years. Cigarette smoking is a direct cause of about 85% lung cancer. In this all male patients were smokers while the female patients denied smoking.

Different techniques used to diagnose pulmonary malignancies include bronchoscopic biopsy, brushings, washings, Transthoracic core needle biopsy, open lung biopsy, lymph node biopsy and Fine Needle Aspiration Biopsy / Cytology¹.

Fiberoptic bronchoscopy has revolutionized the diagnosis of bronchogenic carcinoma but is not helpful in peripheral lesions. These lesions always pose difficulties in the diagnosis. These difficulties have been overcome by the introduction of Fine Needle Aspiration. Fine Needle Aspiration has gained tremendous popularity in the last few decades¹³⁻¹⁴. FNAC is useful in deciding the therapeutic approach in patients in whom results of bronchoscopy and sputum cytological study are not diagnostic¹⁵.

When FNAC is performed properly the sensitivity is high 80% and specificity more than 90% for malignant diseases, but is considerably less accurate for benign diseases⁷.

Other studies which have been conducted in different countries, the sensitivity of FNAC in diagnosing malignant disease of the lungs has varied from 64% to 97%¹⁶⁻¹⁸. Diagnosing metastatic or recurrent malignancy by FNAC generally has high specificity and sensitivity¹⁹.

In the present study, the sensitivity of FNAC was 70% which is almost similar to other studies¹⁶⁻¹⁸.

There are four major histotypes of primary lung cancer. Squamous cell carcinoma and adeno carcinoma are the main types, about 30-35% each small cell carcinoma and large cell carcinoma account for about 20-25% respectively²⁰.

Initially the incidence of squamous cell carcinoma used to be high i.e. 45-60% and Adeno carcinoma was low 10-12% but now different studies shown that pattern of bronchogenic carcinoma is changing and adeno carcinoma is becoming more prevalent²¹.

The present study showed, sq. cell CA 66.6% adeno carcinoma 28.6% and small cell carcinoma 5.8%. This is similar to the reported incidence in the past from other countries. This may be due to the fact that bronchogenic carcinoma formerly in our community was not a common disease. It is now towards increase due to increased cigarette smoking in the community. The behaviour may be similar as it used to be in other communities in the past. Somehow the study was small of only 30 cases and a larger study is required to further support this incidence.

The complication of pneumothorax ranges from 9% to 61%²² while in our study the percentage of pneumothorax was only 10% and four patients (13%) complained of chest pain

CONCLUSION

From the present study it is evident that FNAC of the peripheral lung lesions or larger lesions is very safe, quick and reliable method for establishing diagnosis of lung cancers where bronchoscopic help is not available or the tumour is not within the reach of bronchoscope. The complication rate is low. Only 10% developed pneumothorax, out of which one needed chest intubation for three days. Thirteen percent had mild chest pain. Hence it is recommended that FNAC should be performed more frequently without any fear when ever indicated.

REFERENCES

1. Mures M. Lung Cancer. Medical Int 1995;9(31): 361-367.
2. Boring CC, Squires TS, Tong T. Cancer Statistics, 1992. CA-A Cancer J Clin 1992;42: 19-38.

3. Ahmad M. Khan AH, Mansoor, A. The Pattern of malignant tumors in Northern Pakistan AFIP Monograph 1990:1-62.
4. Ahmad I. A morphological evaluation of bronchial biopsy, washing and brushing using fiberoptic bronchoscope in lung disease (Thesis). Lahore; University of Punjab, 1986: 1-60.
5. PMRC. Malignant tumours; Report of a multicentric study. PMRC Karachi 1982; 1-15.
6. Chughtai AS. Fiberoptic perbronchial biopsy; A morphological analysis (Thesis), Lahore: University of the Punjab, 1991: 1-100.
7. Kotsimbos T, Walters EH. Percutaneous needle aspiration. *Medicine International* 1995; 9(30):250-55.
8. Willaims TJ, Dar KJ. The risk of Fine Needle Aspiration in the Diagnosis of Palpable Metastasis from lung cancer. *Respiratory Medicine* 1995; 89: 545-546.
9. Forelon L. Werisbrod. Transthoracic Percutaneous lung 1990; 28: 647-655.
10. Derek E Roskell, Ian D Buley. Fine needle aspiration cytology in cancer diagnosis. *BMJ* 2004;329:244.
11. Davis RJ. Tumours of the Respiratory Tract. In: Kumar. P, Clarck M, editors. *Clinical Medicine*. 3rd ed. ELBS with Beilliere Tindall: London; 1994.p.699-703.
12. Minna JD. Neoplasm of the lung. In: Issebacher. Braunwald. Wilson. Martin Fauci, Kasper, editors. *Harrison's Principle of Internal Medicine* 13th ed. McGraw Hill Inc: 1994.p.1221-1229.
13. Buccheri G, Barberis P. diagnostic. Morphologie and Histopathologie Correlates in Bronchogenic Carcinoma. A review of 1. 045 Bronchoscopic Examination. *Chest* 1991;99:809-814.
14. Lyubsky S. Jacobson. Lung Cancer. Making diagnosis. *Chest* 1991;100:511-520.
15. Mukherjee S, Bandyopadhyay G, Chiya AB, et al. CT guided FNAC of solitary pulmonary nodule suspected to be bronchogenic carcinoma: Experience of general hospital. *J Cytol* 2010; 27 (1) : 8-11.
16. Adler OB. Rosenberger A. Peleg II: Fine needle aspiration biopsy of mediastinal masses: evaluation of 136 experiences. *AJR* 1983; 140: 893-896.
17. Herman PG, Hessel SJ. The diagnostic accuracy and complications of closed lung biopsies. *Radiology* 1997; 125: 11-14.
18. Lalli AF, McCormac IJ, Zelch M, et al. Aspiration biopsies of chest lesions. *Radiology* 1978; 127: 35-40.
19. Buley ID, Roskell DE. Fine needle aspiration cytology in tumour diagnosis : uses and limitations. *Clin Oncol* 2000 ; 12:166-71.
20. Westcott JL. Direct Percutaneous needle aspiration of localized pulmonary lesion: Results in 422 patients. *Radiology* 1980; 137: 31-35.
21. Stauffer JL. Bronchogenic Carcinoma. In Lawrence M, Macphie J.S, Papdakis M.A. eds. *Current Medical Diagnosis and treatment*. 37th ed. Appleton and Lange. Stamford 1998; 251-332.
22. Tanaka I, Matsubara O, Kasuga T. Increasing Incidence and Changing Histopathology of primary Lung Cancer in Japan A Review of 282 autopsied Cases. *Cancer* 1988; 62: 1035-1039. Westcott JL. Percutaneous transthoracic needle biopsy. *Radiology* 1988; 169:593.

Address for Corresponding Author:**Dr. Nadeem Anwar**

Assoc. Prof. Pulmonologist Dept.

Bolan Medical College, Quetta.

H.No.162 Survey 528,

Club Road, Quetta Cantt.