

COMPARISON OF CONVENTIONAL BRONCHOSCOPY AND FINE NEEDLE ASPIRATION BIOPSY IN THE DIAGNOSIS OF MASS LESIONS IN THE LUNG: A PROSPECTIVE STUDY

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ABSTRACT

OBJECTIVE: This study was done to compare conventional bronchoscopy with fine needle aspiration in the diagnosis of cause of mass lesions in the lungs in our setting.

MATERIAL AND METHODS: Patients presenting to Medical and Chest Units of Nishtar Hospital, Multan who had mass lesion in the lung on chest X-ray were included in the study. Both bronchoscopy and FNA were done in all the patients.

RESULTS: A total of 81 patients were studied between 1993 and 1998. There were 72 males and 9 females. Their ages varied from 18 to 85 years, with an average age of 51.71 years. A final diagnosis was possible in 74 (91%) cases; 62 (76%) patients had malignancy, 12 (15%) patients had non-neoplastic diseases of which tuberculosis was the commonest (7.5%) and 7 (9%) patients remained undiagnosed. Bronchoscopy showed endobronchial lesions in 39 cases. Bronchial brushings and bronchial biopsy from these lesions led to the diagnosis in 35 cases (90%). Brushings were also

taken from the suspected areas in 42 cases without endobronchial lesions and only 5 cases (12%) showed evidence of malignancy. Fine Needle Aspiration was carried out in all 81 cases and it was positive in 65 cases (80%). In 39 cases with centrally located lesions FNA was positive in 28 cases (72%); in 42 peripherally located lesions FNA was diagnostic in 37 cases (88%).

CONCLUSION: It was concluded that bronchoscopy had better yield in the centrally located lesions while FNA showed better results in peripherally located lesions.

KEY WORDS: Mass lesions in the lung, lung mass, bronchoscopy, FNA.

INTRODUCTION

Mass lesions of the lung are common and present a diagnostic problem. Examination of the tissue is the only mean of definite diagnosis which can be obtained through either bronchoscopy or fine needle aspiration biopsy. This study was conducted to compare and contrast results of both procedures in our setting.

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MATERIAL AND METHODS

This study was conducted at Nishtar Hospital Multan, an 1100 bedded teaching hospital which drains patients from South Punjab and adjacent areas of Sind, Balochistan and Frontier. It extended from 1993 to 1998. Patients with possible cystic lesions or acute lesions due to consolidation were excluded from the study.

After history, physical examination and routine investigations bronchoscopy and FNA were carried out in all the patients. On bronchoscopy biopsy and brushings were taken from visible lesions while only brushings were obtained from suspected areas corresponding to radiological location of the lesions when no lesion was seen.

FNA was carried out using standard "Sure-Cut" needles (TSK modified Menghini biopsy set) of 18 - 20 gauge both for aspiration and biopsy. The intercostal space overlying the lesion was used for puncture anteriorly, posteriorly or in the axilla shown by PA and lateral chest radiographs. In the majority of the cases help was obtained from the sonologist for marking the point and depth for the insertion of the needle. A number of slides were prepared from the aspirate. Two slides were immediately fixed in absolute alcohol and the remaining air dried for further staining procedures. The available tissue fragments were fixed in 10% formalin solution for histopathological examination.

RESULTS

A total of 81 patients, with radiological evidence of a mass lesion in the lung were studied. There were 72 males and 9 females. They were between 18 and 85 years of age.

The final diagnosis was made on the basis of tissue examination obtained on bronchoscopy and FNA. Sixty-two (76.54%) cases had malignancy, 12

(14.81%) cases had non-neoplastic lesions while no diagnosis could be made in 7 (8.64%) cases. Bronchoscopy led to the diagnosis in 40 (49.38%) cases while FNA was positive in 65 (80.25%) cases (table - I).

TABLE - I

FINAL DIAGNOSIS (n : 81)

Diagnosis	Total No. of cases	Bronchoscopy	FNA
Neoplastic lesions	62 (76.54%)	40 (49.38%)	53 (65.43%)
Bronchogenic carcinoma	58 (71.60%)	40 (49.38%)	49 (60.49%)
Lymphoma (non Hodgkin)	2 (2.47%)	-	2 (2.47%)
Other tumors	2 (2.47%)	-	2 (2.47%)
Non-neoplastic lesions	12 (14.81%)	-	12 (14.81%)
Tuberculosis	6 (7.40%)	-	6 (7.40%)
Chronic lung abscess	3 (3.70%)	-	3 (3.70%)
Other lesions	3 (3.70%)	-	3 (3.70%)
Total	74 (91.36%)	40 (49.38%)	65 (80.25%)
Diagnosis could not be made	7 (8.64%)	41 (50.62%)	16 (19.75%)
Total	81	81	81

On bronchoscopy endobronchial lesions were seen in 39 cases. Bronchial brushings were obtained from all these cases, they were positive in 31 (79.5%) cases. All but one lesion (which was very vascular) were biopsied and 27 (71.1%) of these showed evidence of disease (table - II). Bronchoscopy with the help of brushing and biopsy in central lesions led to the diagnosis in 35 (89.74%) cases (table III). Brushings were also taken from the suspected areas (corresponding with radiological location of the lesion) in 42 cases without endobronchial lesions and only 5 cases (12%) showed evidence of malignancy.(table - II).

TABLE - II

BRONCHOSCOPY RESULTS (N : 81)

Centrally located (N:39)				Peripherally located (N:42)	
Brushing		Biopsy		Brushings	Biopsy
N:39		N:38			Not possible
+ive	-ive	+ive	-ive	+ive	-ive
31	8	27	11	5	37
(79.5%)	(20.5%)	(71.1%)	(28.9%)	(11.9%)	(88.1%)

Fine Needle Aspiration was positive in 28 out of 39 centrally located lesions (71.79%) and 37 out of 42 peripherally located lesions (88.1%) (table III).

TABLE - III
COMPARISON OF DIAGNOSTIC YIELD OF
BRONCHOSCOPY AND FNA (N : 81)

Location of the lesion	Total No.	Diagnosed on bronchoscopy	Diagnosed on FNA
Centrally located	39	35 (89.74%)	28 (71.79%)
Peripherally located	42	5 (11.90%)	37 (88.1%)
Total	81	40 (49.38%)	65 (80.24%)

Complications included vasovagal reaction, hemoptysis and pneumothorax. These were seen in 11 (13.6%) cases on bronchoscopy and in 13 (16.0%) cases on FNA (table - IV).

TABLE - IV
COMPLICATIONS FOLLOWING FNA
AND BRONCHOSCOPY (N:81)

Complications	Bronchoscopy	FNA
Vasovagal	2 (2.5%)	Nil
Hemoptysis	8 (9.9%)	5 (6.2%)
Pneumothorax		7 (8.6%)
Respiratory distress	1 (1.2%)	Nil
Subcutaneous emphysema	Nil	1 (1.2%)
Total	11 (13.6%)	13 (16.0%)

DISCUSSION

Fiberoptic bronchoscopy has become established as a standard practice and has been in regular use for many years in diagnostic work up of the patients with suspected lung tumor. Combination of bronchial biopsy and brushings is usual for endobronchially visible tumors, while washings, brushings, transbronchial biopsy and recently transbronchial needle aspiration biopsy (TBNAB) under real ultrasonic and fluoroscopic control are considered the best initial procedures for the diagnosis of lesion not visible endoscopically (1). Bronchoalveolar lavage should also be performed and the lavage fluid analyzed for malignant cells (2).

The diagnostic yield of biopsy of bronchoscopically visible tumor is over 90% in the best hands (3). The diagnostic yield in peripherally located lesions

depends on many factors like operator skill and the availability of real time fluoroscopic and ultrasound guidance. The overall yield for biopsy and brushing of peripheral lesions has been reported to vary widely between 30% and 90% (2, 4, 5, 6, 7, 8, 9). The present study did not include transbronchial needle aspiration biopsy (TBNAB) and bronchoalveolar lavage because of lack of facilities and operator experience in these techniques. In our study combination of biopsy and brushings was used for the diagnosis of endobronchial lesion while only brushings were collected from the areas suspected to be abnormal on the basis of radiological findings (a blind procedure). Results of these brushings were poor and only 5 out of 42 cases showed evidence of disease.

In the present study, Fine Needle Aspiration was diagnostic in 65 out of 81 cases (80.25%); out of these 53 (65.43%) were malignant and 12 (14.81%) were benign. Out of total 62 cases of malignancy, 53 (85.48%) were diagnosed on FNA. Diagnostic yield of FNA in neoplastic lung lesions reported by other workers varies from 49 to 97 percent (10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21). These results are comparable with our results.

Twelve cases of non neoplastic lesions were also diagnosed on FNA. There were 06 cases of tuberculoma, 03 cases of chronic lung abscess and 01 case each of pleural thickening, fungus granuloma and encysted pleural effusion.

Many studies indicating the value of FNA in various benign lesions of lung like tuberculosis, fungal granulomas, sarcoid granuloma, pulmonary infections, pulmonary infarcts have been reported with variable success rate (22, 23, 24, 25, 26).

In 39 centrally located cases bronchoscopy was positive in 35 (89.74%) cases and FNA was positive in 28 (71.79%) cases. In 42 peripherally located

cases bronchoscopy was positive in 5 (11.95%) cases and FNA was positive in 37 (88.1%) cases. Overall efficacy of bronchoscopy and FNA was 49.38% and 80.24% respectively.

It is obvious from these results that bronchoscopy is a more sensitive diagnostic technique in centrally located lesions while FNA is more diagnostic in peripherally located lesions. Difference is statistically significant ($P < .0001$).

Complications as a result of bronchoscopy and FNA in 81 cases in the present series occurred in 11 cases (13.6%) and 13 cases (16. %) respectively and there was no mortality. Common complications were pneumothorax and hemoptysis. All the complications could be managed successfully.

CONCLUSION

Bronchoscopic brushings and biopsy is the investigation of choice for centrally located, endoscopically visible lesions while FNA gives better diagnostic yield in peripherally placed lung masses. Overall yield of FNA is also better than that of bronchoscopy. FNA is an accurate, safe and quick method of diagnosis for lung masses with minimal morbidity. This is cost effective, only expense involved is a disposable syringe. It is very relevant in our setting where bronchoscopy is not freely available. It is worth recommending as a routine practice for the diagnosis of mass lung lesions.

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