



# ORIGINAL RESEARCH PAPER

# Pulmonary Medicine

## DIAGNOSTIC YIELD OF VARIOUS PROCEDURES IN LUNG MALIGNANCY IN A TERTIARY CARE HOSPITAL

**KEY WORDS:** Lung Malignancy, CT Biopsy, FNAC, Sputum Cytology, Bronchoscopy

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### ABSTRACT

Lung cancer is presently the most common malignant disease and the leading cause of cancer deaths in the world. Its incidence peaks between 55 and 65 years. Globally 85 % of lung cancer in males and 46 % in females is due to smoking. The most common cancer initially worldwide was Squamous Cell Carcinoma, but however the most common malignancy now is Adenocarcinoma. In the last few years, there has been an increasing number of cases in Females and Non Smokers as well.

Lung Malignancies can be detected by various diagnostic modalities, but invasive and Non-invasive. The protocol is usually to start with the least invasive modality, and if it is unable to detect the malignancy, to opt for a higher modality. The simplest methods which can be used include Sputum Cytology, preferably for a period of three consecutive days or fine needle aspiration/Biopsy of a peripheral lymph node. However over the years, with advancement in technology, CT guided Biopsy and FOB (Fibre Optic Bronchoscopy) guided biopsies have emerged as most commonly used invasive methods. There have been recent innovations in this field as well with the advent of Endo Bronchoscopic Ultrasound. With this background the present study will be conducted to compare the diagnostic yield of various procedures, both invasive and non-invasive procedures.

### Materials and Methods :

After obtaining approval of the Institutional Ethics Committee, 45 patients who visited the Pulmonary Medicine OPD or admitted in Pulmonary Medicine Ward in a tertiary Care hospital in Pune from December 2017 to October 2019 was enrolled in the study.

Proper clinical history was taken, Chest X Ray and Computed Tomography was done. In view of any suspicion in malignancy either from clinical or radiological evidence, patient was subjected to Various investigational modalities namely Sputum Cytology, Fine needle Aspiration Cytology (FNAC) or Lymph node biopsy. If patient had pleural effusion, a pleural fluid analysis was done. Similarly with subject to clinical fitness, a Computed Tomography guided biopsy or a Bronchoscopic Biopsy was done.

Using proper statistical analysis, the diagnostic yield of various modalities were compared and results were compiled

### Results :

#### SPUTUM CYTOLOGY

**Table 1: The table depicts the yield of Sputum Cytology.**

Sputum	Number of patients	Percentage (%)
Positive	14	28.0
Negative	36	72.0
Total	50	100.0

Sputum Cytology were found to be positive for malignant cells in 28 % of the cases

#### Fine Needle Aspiration Cytology/Lymph Node Biopsy

**Table 2: FNAC /Lymph node biopsy were attempted in around 30% of the subjects. Out of the 30 % that underwent FNAC/Lymph Node biopsy 16 % were detected to have malignancy after Histopathological Studies. FNAC was thus found to be positive in 53.3 % of**

### the cases. ( among the patients in which it was performed)

FNAC/LN Biopsy	Number of patients	Percentage (%)
Positive	8	16.0
Negative	7	14.0
Not Done	35	70.0
Total	50	100.0

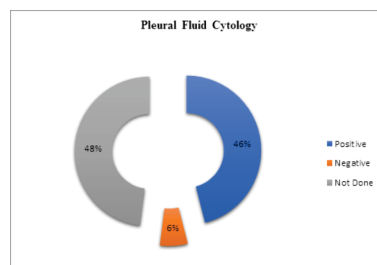
### PLEURAL FLUID ANALYSIS AND CYTOLOGY

**Table 3: Among the 26 patients that underwent pleural fluid cytology and analysis, 23 patients (46 %) were found to be positive for malignant cells.**

Pleural fluid Cytology	Number of patients	Percentage (%)
Positive	23	46.0
Negative	3	6.0
Not Done	24	48.0
Total	50	100.0

3 patients who were found to be negative showed evidence of inflammatory reactions, they were later proven positive through CT/Bronchoscopy biopsy.

So, among all patients that underwent Pleural Fluid Analysis and cytology, 88.4 % were detected positive for malignancy. Considering the entire population of lung malignancy patients pleural fluid cytology was positive in 46 % of the patients.

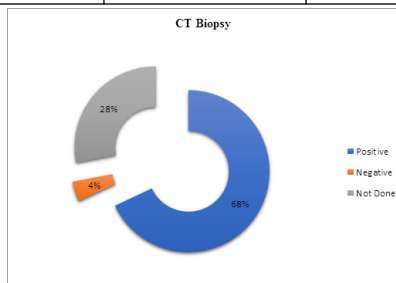


**Figure 3:** Pleural Fluid Cytology was not done in 46 % of the subjects as they did not have any clinically detectable pleural effusions. Among the patients that underwent pleural fluid analysis and cytology only in 6 % of cases malignancy could not be detected. This means that among all the patients that underwent Pleural Fluid analysis 88.4 % were found to be positive

### Computed tomography guided biopsy

**Table 4:** Computed Tomography guided biopsy procedures were done in 36 patients, with 34 of biopsy specimens after histopathological analysis being found positive for malignancy. Majority of lesions were peripheral lesions. 94.4 % of the patients that underwent CT Biopsy were found positive for Malignancy. In total 68 % of the patients were detected positive through CT guided Biopsy Procedure.

CT Biopsy	Number of patients	Percentage (%)
Positive	34	68.0
Negative	2	4.0
Not Done	14	28.0
Total	50	100.0



**Graph 2:** CT guided biopsy could be performed only in 72 % of the patients. Among the 72 % that underwent the procedure 68 % were found to be positive for malignancy.

This shows that among the subjects that underwent the procedure 94.4 % were detected positive for Malignancy. In around 28 % of the subjects, Biopsy could not be performed mostly due to inaccessibility of the lesions or due to other risk factors

#### FLEXIBLE BRONCHOSCOPY (FOB) AND LUNG BIOPSY

**Table 5: Bronchoscopy Biopsy was performed in 35 patients, of which 24 patients (48%) were found to be positive for malignancy after histopathological analysis.**

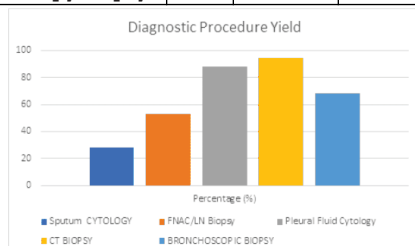
Bronchoscopy Biopsy	Number of patients	Percentage (%)
Positive	24	48.0
Negative	11	22.0
Not Done	15	30.0
Total	50	100.0

This means that 68.57 % who underwent bronchoscopy procedure were found to be positive and 32 % were found to be negative. Among all the 50 malignancy patients, 48 % were detected using Bronchoscopy biopsy. 15 patients could not be taken up for bronchoscopy biopsy due to patient related co morbidities and lesions being inaccessible through the bronchoscope.

#### COMPARISON OF DIAGNOSTIC YIELD OF VARIOUS PROCEDURES

**Table 6: shows the diagnostic Yield and comparison of various procedures that were used to detect Lung Malignancy. Among all the procedures the highest yield was for CT Guided Biopsy (94.4 %) followed by pleural fluid cytology (88.46 %). The least effective procedure was Sputum Cytology which picked up only 28 % of the cases. Bronchoscopy Biopsy had third highest yield. (68.57 %)**

Test	N	Positive	Percentage (%)
Sputum Cytology	50	14	28.00
FNAC/LN Biopsy	15	8	53.33
Pleural Fluid Cytology	26	23	88.46
CT BIOPSY	36	34	94.44
Bronchoscopy Biopsy	35	24	68.57



**Graph 3 :** From the above graph it is clear that CT Guided Biopsy had the highest yield followed by Pleural Fluid

Cytology, followed by Bronchoscopy biopsy and FNAC/LN Biopsy .Sputum Cytology had the least yield among all the diagnostic procedures with only 14 % of cases being detected by sputum cytology .CT Biopsy was positive in 94.44 % of the patients .Thus, among all the procedures that were used in the study CT Biopsy was found to be the one with the highest yield.

#### DISCUSSION :

The study observed the various diagnostic Modalities that was used for the treatment of Lung Cancer Patients. Sputum Cytology was done for all the patients. FNAC/Lymph Node biopsy were done for patients with accessible lymph Nodes. Pleural Fluid was subjected to analysis and Cytology for Malignant Cells. CT guided biopsy of Peripheral Lesions, fiberoptic bronchoscopy and Bronchoscopy guided Biopsy were done.

Among all the diagnostic procedures CT Guided Biopsy was found to be the investigation with the highest amount of yield. Among 36 patients who underwent CT Biopsy after meeting the required criteria about 34 were detected as Malignancy after Biopsy investigations. This also agrees with the fact that most of the malignancies were peripheral lesions. Thus, CT Biopsy had a yield of about 94.4 %. Pleural fluid cytology also a very good yield in diagnosing lung cancer, although lesser than CT Guided Biopsy .

#### REFERENCES :

1. Dattatreya SP, Bansal R, Vamsy M, Vaniawala S, Nirni SS, Dayal M, et al. Clinicopathological profile of lung cancer at a tertiary care center. Indian J Cancer. 2018;
2. Acharya KV, Unnikrishnan B, Shenoy A, Holla R. Utility of various bronchoscopic modalities in lung cancer diagnosis. Asian Pacific J Cancer Prev. 2017;
3. Muley DS. Diagnostic Yield of Various Procedures in Lung Cancer. J Med Sci Clin Res. 2017;
4. Noronha V, Pinninti R, Patil V, Joshi A, Prabhash K. Lung cancer in the Indian subcontinent. South Asian J Cancer. 2016;
5. Pujari V V, Lokhande M R, Meshram H S, Waghmare D R. CLINICAL AND PATHOLOGICAL PRESENTATIONS OF BRONCHOGENIC CARCINOMA IN A TERTIARY CARE CENTRE. J Evol Med Dent Sci. 2016;