



ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY AND TRUCUT BIOPSY IN DIAGNOSIS OF LUNG MALIGNANCY

Medicine

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ABSTRACT

Background: Lung cancer is the major cause of cancer related deaths all over the world. CT/USG guided FNAC and/or biopsy of lung mass is an effective modality to diagnose lung cancer, especially in peripherally situated lesions. This study was planned to compare the role of CT/USG guided lung FNAC and biopsy in diagnosis of Lung cancer. **Material and methods:** This is an observational study, done in a teaching hospital of Ujjain [M.P.] over a period one year. All the patients with suspected mass lesion on chest X-ray and clinical symptoms suggestive of lung cancer were included in the study. CT/USG guided Fine Needle Aspiration Cytology and Trucut-biopsy histopathology were done in each patient after explaining the risks. **Results:** CT/USG guided procedures were done in 58 patients of suspected lung cancer. CT/USG guided FNAC yielded positive results in 42 patients while it was negative in 8 patients, in these 8 patients FNAC was positive for malignant cells but specific typing could not be done. Out of total 58 patients malignancy was confirmed in 55 patients with the help of Trucut biopsy. Squamous cell carcinoma was most common type of malignancy encountered. **Conclusions:** This study suggests that CT/USG guided lung FNAC is a safe and well tolerated procedure with good yield/results. Though the sensitivity of FNAC is good for diagnosing lung cancer, still Trucut biopsy has better sensitivity and specificity than FNAC and it helps in better differentiation of lung malignancy in various subtypes which was sometimes not possible through the FNAC alone.

KEYWORDS

INTRODUCTION

Lung cancer is the most commonly diagnosed malignancy across the globe, especially in males (1). It is the leading cause of cancer related deaths with an average 5 year survival rate of 16.8% (2). CT/USG guided fine needle aspiration cytology (FNAC) and Trucut biopsy are simple methods to diagnose lung cancer in a vast majority of patients, especially in peripherally situated lesions. FNAC was first used by Martin and Ellis as a diagnostic tool (3). Leyden in 1883 and Menbriel in 1986 introduced the technique as diagnostic lung puncture for detection of malignancy and infection. FNAC can sub classify the type of bronchogenic carcinoma and the vast majority of lung malignancies can be confidently diagnosed with cyto-morphological characterization in right clinical context. The purpose of our study was to evaluate the diagnostic utility of CT/USG guided FNAC and to compare it with Trucut biopsy in diagnosis of lung malignancy.

MATERIAL AND METHODS

This is an observational study, done in Department of Respiratory Medicine, R.D Gardi Medical College and Hospital, Ujjain, [M.P.] over a period of 12 months from January 2019 to January 2020. Study was approved by Institutional ethical committee. All the patients with suspected mass lesion on chest X-ray and clinical symptoms suggestive of lung cancer were included in the study. Written consent was taken from each patient. Clinical history was taken in detail and routine blood investigations were sent, including BT, CT and INR. Patients with bleeding disorder, uncontrolled cough and suspected hydatid cyst and those who refuse to participate in the study were excluded. CT/USG guided FNAC and Biopsy were done in each patient after explaining the risks. 22 gauge needle was used for aspiration. Biopsy of the lesion was done using Trucut Biopsy needle. Aspirated materials were subjected to cytological examination and reported into 3 groups, as: 1) Positive for malignancy (PFM) when cytology showed diagnostically malignant cells. 2) Suggestive for malignancy (SFM) when cytology showed atypical cells with no definite evidence of malignancy. 3) Negative for malignancy (NFM) when cytology did not reveal malignant or atypical cells. Cytological findings were confirmed and specific typing of malignancy was done by histopathological examination with the help of Trucut biopsy.

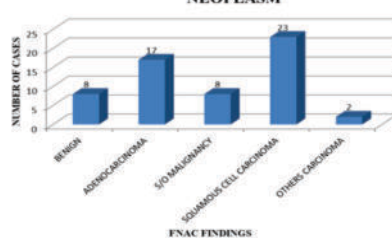
RESULTS

A total of 58 patients were included in study, out of which 49 (84.5%) were male and 9 [15.5%] were female. Male to female ratio was 5.44:1. Most common site for malignancy was right lung [55.2%], followed by left [37.9%], and only 7% were bilateral. Most of the patients were in age group 41-60 years (51.7%). Mean age was 59.4 years. Out of the total 58 participants, mostly 34 [58.6%] was farmers

as most of the population were from rural areas and most of the females were housewives 9 [15.5%]. In our study, 45 [77.6%] of total patients were addicted to either tobacco or smoking or both. Out of total 58 patients, specific type of lung cancer was confirmed in 42 patients, in 8 patients, FNAC was positive for malignant cells but specific typing could not be done and in rest 8 patients 2 were negative for malignancy, 1 was reported acellular smear and 5 were reported inflammatory smear.

Out of total 58 patients, malignancy was further confirmed in 55 patients with the help of Trucut biopsy. 44.8% (26) were diagnosed with squamous cell carcinoma, 39.6% (23) were cases of adenocarcinoma, 5.2% were patients of Small cell carcinoma, 1.7% (3) case was each of Carcinoid tumour and spindle cell carcinoma, followed by 1.7% case of metastatic carcinoma reported in young lady by Trucut biopsy, who was also having breast cancer, 1.7% case was reported negative for malignancy and 3.4% were reported inflammatory smear via Trucut biopsy.

FNAC FINDINGS OF PATIENTS WITH LUNG NEOPLASM



TRUCUT BIOPSY REPORTS IN PATIENTS WITH LUNG NEOPLASM

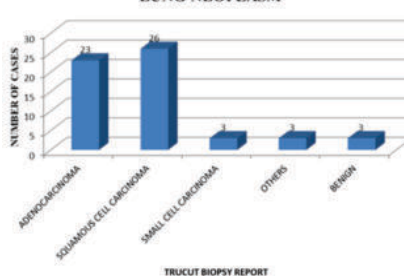


Figure shows computed tomography guided fnac of cavitating left upper lobe mass lesion with metastatic nodule in right lung:



DISCUSSION

Lung cancer is one of the most common of cancer diagnosed worldwide and it is the major cause of cancer mortality in males. The diagnosis of lung cancer depends upon examination of fine needle aspirated sample and/or Biopsy sample taken from the lesion. Bronchoscopy is useful to obtain FNA/biopsy sample in centrally situated lesions while CT/USG guided FNAC or Trucut biopsy guided procedure is useful in peripherally located lesions.

In our study, patients were in age group between 21-90 years, minimum age was 21 years, maximum age was 90 years. Most of the patients that is 30 [51.7%] patients were in age group of 41-60 years and the mean age was 59.4 years. Male: Female ratio was 5.22:1.

The commonest risk factor for development of lung cancer found in our study was smoking. History of Anti tubercular treatment was present in 15[25.9%] patients, out of which 7 [12.1%] patients were currently on ATT. Out of these 15 cases, 13 cases of lung malignancy were misdiagnosed as pulmonary tuberculosis; only 2[3.4%] patients were sputum smear positive for Acid Fast Bacilli. So, proper evaluation with use of diagnostic modalities like sputum for AFB, sputum for CBNAAT, CT scan Thorax and bronchoscopy are required for properly diagnosing Lung cancer and Pulmonary Tuberculosis. A wrong diagnosis of tuberculosis in Lung cancer patients is also reported in studies by Bhatt M, Suryakant et al (4), VK Singh, Amitabha Chakrabarti et al (5). Failure in diagnosis of the lung cancer by clinician delays the treatment as it results in lung cancer being diagnosed in advance stage which cannot be treated with curative intent.

Clinically patients presented as mass lesion in 38 (65.5%), pleural effusion in 10 (17.3%), pneumonia in 13 (22.4%) cases. Similarly, Randeep Guleria, Ravendra M Pandey, Anant Mohan and colleagues et al (6), Jindal and Behera (7) also found mass with or without collapse/consolidation as the most common clinical presentation. Most common radiological findings on contrast enhanced Computed Thorax [CECT Thorax] / Chest X-ray was the mass lesion seen in all patients of Lung Cancer. Most of the biopsies are performed under CT guidance as CT tells exact path for FNAC/biopsy and dimensions of lesion.

CT guided FNAC is safe and has high sensitivity and specificity with a high diagnostic accuracy with few complications. Yadav RK et al [8], Syed A, Shadab et al [9], diagnostic accuracy range from 64-97%. In our study, sensitivity of FNAC was found to be 89% which is comparable with the result reported by Li H et al (96%) [10] and Jaya Shanker et al (>91%) [11]. A total of 58 patients were evaluated in our study, out of which specific type of lung cancer was confirmed in 42 patients, in 8 patients FNAC was positive for malignant cells but specific typing could not be done and in remaining 8 patients 2 were negative for malignancy, one was reported acellular smear and 5 were reported as inflammatory smear. Out of 42 patients, squamous cell carcinoma was seen in 23(39.7%) patients, adenocarcinoma in 17(30%), small cell carcinoma and metastatic carcinoma seen in 1(1.7%) patient each respectively. The sensitivity of FNAC for diagnosing malignancy was found to be 89% in our study. This finding is similar to the study done by Singh et al [12], Stanley et al [13] and Beslic et al [14]. We had also performed Trucut biopsy in all patients and we confirmed findings in all those patients who were found to be positive or suspicious or benign on FNAC. All 42 patients those were diagnosed as confirmed malignancy along with the typing of malignancy were also confirmed by Trucut biopsy and no discrepancies were found. 8 patient's smears which were found to be suspicious of malignancy on FNAC but their typing cannot be done due to lack of adequate smear / cytological material on smear, their typing was done and confirmed by histopathology as we obtained good tissue for histopathology via Trucut biopsy. So, with the help of Trucut

biopsy we were able to confirm malignancy in these patients which helped in initiation of chemotherapy. Similarly, we also confirmed malignancy in 5 more patients, those earlier found to be non-malignant on FNAC.

Out of total 58 patients malignancy was confirmed in 55 patients with the help of Trucut biopsy. 26 (44.8%) were diagnosed as squamous cell carcinoma compared to 23 (39.7%) diagnosed by FNAC, 23 (39.6%) were cases of adenocarcinoma as compared to 17 (30%) on FNAC, 3 (5.2%) patients of small cell carcinoma compared to only 1(1.7%) diagnosed by FNAC, followed by 1 (1.7%) case each of Carcinoid tumour and spindle cell carcinoma which could not be diagnosed by FNAC. 1 (1.7%) case of metastatic carcinoma reported in young lady, also having breast cancer by Trucut biopsy which was also reported by FNAC, 1(1.7%) case was reported negative for malignancy and 2(3.4%) were reported inflammatory smear on Trucut biopsy. These findings are similar to the studies done with the help of Trucut biopsy by Shetty et al [15] and Singh et al [12], Rishi Kumar Sharma, Gaurav Chhabra et al [16]. As majority of the patients were smokers and there is good association between smoking and squamous cell carcinoma although smoking is also associated with adenocarcinoma. These findings were similar to the findings of Basnet et al (17) who found squamous cell carcinoma in 50% and as seen in study by Rajeskar S et al (18), Koul et al (19), Notani P et al (20), Sheikh S, Shah A et al (21), Dey A, Biswas D et al (22) but different from the study done by Malik et al (23), Rawat et al (24), Behera D et al (25), Randeep Guleria, Anant Mohan and colleagues et al (6). Reported sensitivity of CT guided Trucut biopsy in our study was 100%. The reported sensitivity of CT guided lung biopsy ranges from 82 to 99% Beslic et al (14), Connor S et al (26). The sensitivity of FNAC and Biopsy in diagnosis of lung cancer was 89% and 100% respectively and on comparison between FNAC and Trucut biopsy in the diagnosis of lung malignancy was found to be statistically significant, chi square value was found to be 19.773 at 95% confidence level and p value was found to be <0.001 which is statistically significant.

Pain in chest at site of biopsy was found in 13 (22.4%) of patients which was resolved later on, minimal haemorrhage was seen in 4(6.9%) of patients which was resolved later on and pneumothorax was seen in only 1(1.7%) patient which required chest tube insertion.

CONCLUSION

CT guided lung FNAC is a safe and well tolerated procedure which confirms the diagnosis in most of the cases of Lung cancer. Though the sensitivity of FNAC is good for diagnosing Lung cancer, still biopsy would be preferable because it has better sensitivity and specificity and it helps in differentiation of Lung cancer in various subtypes. So both the modalities need to be combined for better diagnosis and typing of peripheral lung cancer cases.

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