



COMPUTED TOMOGRAPHY (CT) GUIDED TRANSTHORACIC BIOPSY/ FINE NEEDLE ASPIRATION CYTOLOGY IN THORACIC MASS LESION IN RURAL INDIA

Radiodiagnosis

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KEYWORDS:

INTRODUCTION

The most commonly encountered malignancy across the globe are lung tumours, making it the leading cause of cancer related mortality with an average of 4.5 years survival rate. (1) There is an increase in utilisation of CT thorax as an imaging tool to evaluate symptomatic patients leading to incidental findings of suspicious lesions. Earlier bronchofiberscopy was done but, the diagnostic accuracy of bronchofiberscopy was 60% (2) that's when role of CT came into picture. CT guided fine needle aspiration cytology (FNAC) and Biopsy are simple methods to diagnose lung cancer especially in peripherally situated or sonographically unattainable lesions. CT guided FNAC implied by Martin and Ellis first as a tool for diagnosis. (3) Later Nordenstrom continued the work was carried forward by Nordenstrom who gave promising results that showed that this procedure can achieve accuracy in diagnosis with less complication. (4) The diagnostic accuracy of FNAC and biopsy is 93% and sensitivity rate is 95%. (5) There are various however manageable complications noted with this procedure like pneumothorax (8–69% of cases (6)), haemoptysis and pulmonary haemorrhage.

The present study was undertaken to know the pathological spectrum of thoracic lesions, their characteristics and appearances on CT and correlate cytological findings with histological features with assessment of the accuracy of biopsy/ FNAC in evaluation of thoracic masses

MATERIALS AND METHODS

We did a cross sectional study on 72 Patients with thoracic masses referred for CT and guided biopsy/ FNAC in our department between June 2015 and January 2017 at a tertiary care centre. Patients with intrathoracic lesions detected on chest X-ray /CT scan and Biopsies of thoracic lesion not approachable by USG were included in our study, whereas, Patients with Severe Chronic obstructive pulmonary disease (COPD), bleeding disorders, pulmonary arterial hypertension (PAH), Contra lateral pneumonectomy cases and that were unable to hold breath and Patient who were not willing for the procedure were excluded.

Patients were informed about the procedure and written consent was taken. Clinical history was taken in detail and routine blood investigations were done. In patients, diagnosed with thoracic mass lesion on CT scan, CT guided biopsy/ FNAC was performed in presence of pathologist. The measurement of the site and angle of entry of the needle, route of the needle, and the distance between the skin and lesion was calculated on CT console. The skin surface was cleaned under all aseptic precautions, lumbar puncture needle was introduced through transthoracic approach after localizing the exact position by CT scan. In case of biopsy, procedure was same except small stab incision is given on skin surface. After placement of the needle, a CT scan slice was taken to ascertain whether the tip of the needle is within the mass. The biopsy sample was collected with lumbar puncture needle and transported in formalin bulb for histopathology block preparation to department of pathology. In case of FNAC, the aspirate was obtained by to and fro and rotating movements of the needle,

smears was prepared as per requirement immediately from the sample in the CT scan room and transported in coupling jars.

RESULTS

72 patients of both sex and varying age group with thoracic masses were referred for CT guided biopsy/ FNAC in our department. The patient's age ranged from 25 to 82 years with a mean of 51 years. The maximum number of patients were in between fourth to sixth decades. Among 72 patients 47 were male patients and 25 were female patients out of which none of the females had smoking history (however passive smoking is very common in India) whereas 30 males had history of chronic smoking.

According to the CT appearance, out of 72 there were 51 cases having features suggestive of malignancy and 21 cases having features suggestive of benign etiology. CT guided FNAC was positive in 65 patients i.e a diagnostic accuracy of 90.2 %. Biopsy was positive in all patients. Out of the 7 diagnostic failure 4 cases had lesions of size less than 2 cm. Of the 65 patients diagnosed by FNAC 49 were malignant and 16 were benign. Out of the malignant lesions Adenocarcinoma was the commonest (41.5%) followed by Squamous cell carcinoma (20%) Large cell carcinoma (7.69%) and Non-Hodgkin's lymphoma (6.15%). (TABLE 1) Of the 16 non-malignant lung lesions, tuberculosis was diagnosed in 7 patients, pneumonic exudates were diagnosed in 4 patients and 5 cases of other benign infectious etiologies. (TABLE 2)

Complications encountered during the procedure or post procedure were very minimum, 3 patients developed small pneumothorax and 2 patients developed hemoptysis and were managed conservatively.

DISCUSSION

Lung cancers accounts for a high rate of mortality. (1) In this cross sectional study of CT-guided lung FNAC /biopsies of 72 patients, we analyzed the diagnostic accuracy, risk factors for diagnostic failure and complications. The procedure is extremely helpful due to its good sensitivity rate in detecting malignant lesions and classifying them. A specific diagnosis whether benign or malignant reduces the unnecessary surgery and the consequential mortality in many cases. (7)

In our study, 72 patients underwent CT guided FNAC of suspicious lung lesions. Male predominance was noted (65.27%) which is similar to the study done by Saha et al (8). Maximum of our cases belonged from fourth to sixth decade with mean age of 51 years which agrees with the observations done by Sumana et al (9) and Sunita et al (10). FNAC was diagnostic in 65 out of 72 cases, providing an analytical accuracy of 90.2 %, which is close to the findings of study done by Li et al (11) and Jaya et al (12) who got 96 % and 91 % accuracy. Sensitivity and diagnostic accuracy of CT guided biopsy was 100% in our study which can be compared with Rishi et al (13) who found similar results. Our maximum diagnostic failure was in cases that had lesions of size less than 2 cm which is similar to the findings of Tsukada et al. (14) who reported diagnostic exactness of 67% for lesions <1 cm and 79% for lesions measuring 1-2 cm. R. Prasad et al (15) concluded

that the principal reason for failure to diagnose was inadequacy of the aspirate due to small size.

Among the malignant lesion the commonest lesion that we came across were Adenocarcinoma (41.5 %) which is possible due to the recent increase in the cases with diagnosis of adenocarcinoma(16). However according to the studies found in literature the commonest malignant lesion found is squamous cell carcinoma (13,15). The commonest benign lesion that was diagnosed was tuberculosis vs pneumonic exudates which can be due to tuberculosis prone region and is comparable with study done by R. Prasad et al (15)

The complication rate was very less in our study, pneumothorax and hemoptysis were noted and the patients were managed conservatively and no intervention was needed which correlates with study done by Simpson RW et al (17), Sharma et al (18) did not observe any complication hence supporting the fact that CT guided FNAC and Biopsy are relatively safe procedure.

CONCLUSION

CT guided lung FNAC is a relatively safe and cost effective procedure which confirms the diagnosis in majority of cases of Lung cancer. Sensitivity of FNAC is excellent for diagnosing Lung cancer and transthoracic Biopsy would be preferable due to its better sensitivity than FNAC. Complications encountered are rare and can be managed conservatively without active intervention.

CYTOLOGICAL FINDINGS	NUMBER	%
ADENOCARCINOMA	27	41.5
SQUAMOUS CELL CARCINOMA	13	20
LARGE CELL CARCINOMA	5	7.6
NON-HODGKINS LYMPHOMA	4	6.1

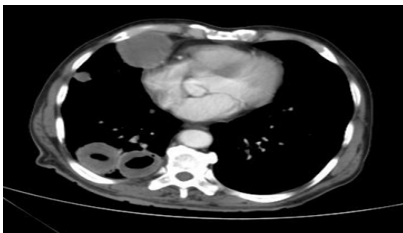
Table 1 : Final diagnosis of malignant lesions

CYTOLOGICAL FINDINGS	NUMBER	%
TUBERCULAR CAUSE	7	43.7
PNEUMONIC EXUDATE	4	25
OTHERS	5	31.2

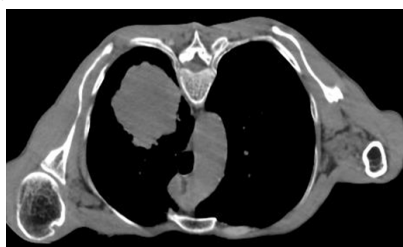
Table 2 : Final diagnosis of benign lesions



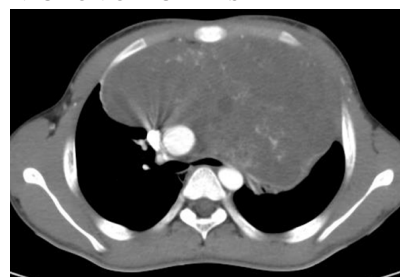
CT SCAN REVEALS SOFT TISSUE ATTENUATION MASS NOTED IN (POSTERIOR BASAL SEGMENT OF LOWER LOBE) OF RIGHT LUNG WITH FEW SPICULATIONS. FNAC: ADENOCARCINOMA



CT SCAN REVEALS MULTIPLE (2) ROUNDED LESION OF VARYING SIZE WITH PERIPHERAL ENHANCEMENT AND HYPODENSE CENTRE SEEN IN RIGHT MIDDLE LOBE. FNAC: SQUAMOUS CELL CARCINOMA.



CT DEMONSTRATES SOFT TISSUE ATTENUATION MASS LESION POSTERIOR SEGMENT OF RIGHT UPPER LOBE FNAC: PNEUMONIC EXUDATES



HETEROGENOUSLY ENHANCING LOBULATED MASS LESION WITH NECROTIC AREAS NOTED PREDOMINANTLY IN ANTERIOR MEDIASTINUM EXTENDING INTO SUPERIOR AND MIDDLE MEDIASTINUM CAUSING ENCASEMENT OF VASCULAR STRUCTURES FNAC: GERM CELL TUMOR



CT SCAN REVEALS ILL DEFINED EXPANSILE LYTIC DESTRUCTION OF 4TH TO 6TH RIB WITH SURROUNDING SOFT TISSUE ON EITHER SIDES OF THE RIB. THE SOFT TISSUE MASS LESION HAS WIDE BASE TOWARDS PLEURA NOTED IN POSTERIOR PART OF RIGHT UPPER AND APICAL PART OF RIGHT LOWER LOBES FNAC: ADENOCARCINOMA

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