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Computed Tomography Guided Percutaneous Thoracic: Fine Needle Aspiration Cytology in Lung and Mediastinum

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Abstract

A prospective and retrospective hospital based descriptive study was done to know the pathological spectrum of thoracic lesions and to correlate the radiological findings with cytological findings obtained from computed tomography guided percutaneous transThoracic fine needle aspiration of lung and mediastinum. The clinical, radiological and cytological data of 60 patients were studied who underwent CT guided FNAC from January 2008- June 2009.

Diagnostic accuracy of FNAC is more than 90%. Out of 60 cases 19 cases are non malignant and 41 cases were malignant. The Diagnostic sensitivity of Bronchogenic carcinoma is 84% and Specificity is 76%. Male to Female ratio is 2.3:1. Majority of cases were seen in 5th and 6th decade. Apart from Non small cell carcinoma cases like small cell carcinoma, Carcinoid tumor, Chondroid hamartoma, SFT were also noted. Cytological diagnosis is correlated with cell block sections in available cases. Post procedural complications like Pneumothorax, Pulmonary hemorrhage and hemoptysis were noted in few cases.

CT guided FNAC is a simple and safe procedure with high diagnostic accuracy in the evaluation of chest lesions. Pneumothorax, hemorrhage and hemoptysis are usually encountered complication. Very few cases require active management.

Keywords: Lung and mediastinum; Cytology; Guided; Percutaneous; TransThoracic

Introduction

Diagnostic cytology is the science of interpretation of cells that are exfoliated from epithelial surfaces or removed from various tissues [1]. Leyden in 1883 and Menbriel in 1986 introduced the technique and diagnostic lung puncture for detection of malignancy and infections [2]. CT guided Fine Needle Aspiration Cytology became first line of diagnostic procedure in diagnosing lung malignancies and confirming metastasis [3,6]. It is a simple and safe procedure. Pneumothorax, hemorrhage, chest pain and hemoptysis are usually encountered complications and very few require active management [4].

Inability to breath, uncontrolled cough, bleeding disorders, PAH and Suspected hydatid cyst are contraindications for CT guided FNAC [4,5].

The aim of this study is to know the pathological spectrum of Thoracic lesions and to correlate the Radiological findings with cytological findings. Using cell block sections cytological diagnosis is correlated in available cases.

Materials and Methods

It is a prospective and retrospective hospital based descriptive study done in Kamineni Hospitals Limited, Hyderabad. After institutional approval the Clinical, Radiological and Cytological information 60 patients were obtained from hospital data that underwent CT guided FNAC from January 2008 to June 2009. Cases with chest mass and having suspicion of malignancy were included in this study. (we got nearly 50% of cases from Refferal centres). Exclusion criteria were Patients with severe chronic obstructive pulmonary disease, PAH, Uncontrolled cough, who is not able to hold breath.

CT guided FNAC was carried out as an outpatient procedure after explaining the risks and benefits, and informed consent obtained from every case. FNAC was performed using 20 gauge needles, the spread glass slide material is immediately fixed in 95% Alcohol for Papanicolaou staining or H&E staining, Air dried slides were used for MGG staining. Cell block material is fixed in Formalin in available cases.

All the patients were kept under observation after the procedure; a repeat scan is done after 1 hour to rule out any complications.

Results

Sixty cases were included in the study. General demographic findings of the study and common disease patterns have been given in Table 1, Table 2, types of Bronchogenic carcinoma have been shown in Table 3, Figure 1 . There were 7 cases below 40 years of age. Majority of the cases seen in 5th and 6th decade. The diagnostic accuracy of CT guided FNAC was more than 90%. Cytological examination showed that 41 cases were malignant and 19 cases were benign. Provisional diagnosis based as radiologic findings were 48 malignant and 12 cases benign. The Diagnostic sensitivity of Bronchogenoc Carcinoma is 84% and Specificity is 76%.

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Pneumothorax developed in two cases, not required active management-kept under observation. Two cases developed hemorrhages. Cell block was submitted in 20 cases. In 2 cases it helped in diagnostic confirmation.

Discussion

It has been mentioned that diagnostic accuracy of CT guided FNAC is between 66 to 97 percent. The diagnostic accuracy of our study is >90%.

In our study the common clinical presentations include cough, cough with expectoration, chest pain, hemoptysis, pleural effusion. Radiologically they mainly presented as lung mass (solitary nodule) mass with cavitation and multiple nodules. Cytologic study showed a malignant pathology in 70% cases, and a benign pathology in 30% cases.

The prevalence of malignancy is significantly less than the 81.8% found in similar study done by Singh et al. [7]. In our study prevalence of Squamous Cell carcinoma & Adeno Carcinoma, 51% and 43% respectively. In Singh et al. [7] it's 22% (both squamous cell carcinoma & Adeno carcinoma equal). Prevalence of small cell carcinoma was 3% in our study similar to 4% in the study by Singh et al. Among benign lesions tuberculosis comprised 12% of our study compared to 33% of their study. In this study, bronchogenic carcinoma was found in 35 out of 60 cases (58%). Among the bronchogenic carcinoma, Squamous cell carcinoma -51%. Adenocarcinoma -43%, Small cell carcinoma and large cell carcinoma in each one case.

SUBJECT	SUB HEADINGS	TOTAL NO	PERCENTAGE
AGE	< 40 Years	7	12
	40 - 49 Years	4	6
	50 - 59 Years	15	25
	60 - 69 Years	21	35
	70 Years and above	13	22
SEX	Male	42	70
	Female	18	30
TYPE OF LESIONS	Lung Mass	55	92
	Mediastinal Mass	5	8
SIDE OF LESIONS	Right	40	66.6
	Left	15	33.4
PROVISIONAL DIAGNOSIS	Malignant	48	80
	Benign	12	20
CYTOLOGICAL FINDINGS	Malignant	41	70
	Benign	19	30
SAMPLING	Adequate	60	100
	Inadequate	0	0

Table 1: Demographic description of the study.

CYTOLOGICAL FINDINGS

DISEASE	NUMBER	PERCENTAGE
Bronchogenic Carcinoma	35	58
Metastatic Lesions	4	6
Carcinoid Tumor	1	2
Solitary Fibrous Tumor	1	2
Chondroid hamartoma	1	2
Thymoma	2	3
Tuberculosis	7	12
Non Specific Inflammatory Lesions	8	13
Bronchioalveolar carcinoma	1	2

Table 2: spectrum of disease as per.

Type	No of Cases	Percentage
Squamous Cell Ca	18	51%
Adeno carcinoma	15	43%
Small Cell Ca	01	03%
Poorly diff Ca	01	03%

Table 3: Types of bronchogenic carcinoma.

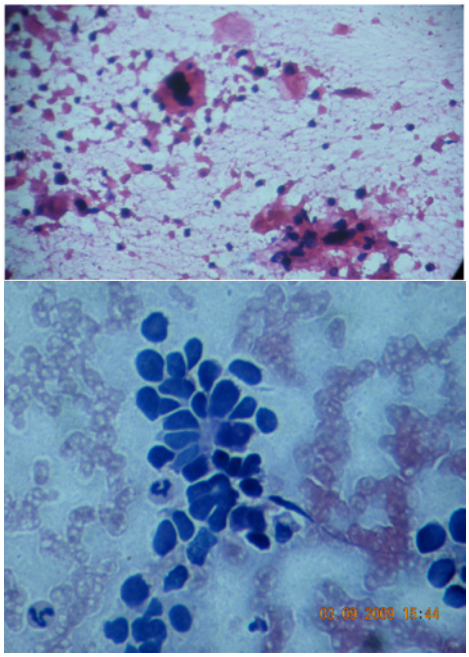

Figure 1:

Pneumothoraxes, Perilesional hemorrhage each in two cases (3%) were noted in this study. Pneumothorox is significantly lower compared to 11.8% seen in Singh et al. [7]. It is comparable to 2.7% and 3.1% seen in Gupta et al. [9] and Gouliamos et al. [8]. Perlesional hemorrhage is comparable to VanSonnenberg et al. [10]. But it is 14.5% in Singh et al study. Regarding cellblock sections, it is available in 25 cases. It is contributory in 21 cases, by confirming the cytological diagnosis.

This study was a both prospective and retrospective study and data was obtained from hospital registry for analysis. The specificity of diagnosing malignancy in this study is 76% and Sensitivity is 84.5%. Large scale of study will be more authentic to establish a statistical significance and correlation.

Conclusion

CT guided FNAC is a simple and safe procedure with high diagnostic accuracy in the evaluation of chest lesions. Pneumothorax,

hemorrhage and hemoptysis are usually encountered complications. Very few cases require active management.

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