

## COMPUTED TOMOGRAPHY GUIDED FINE NEEDLE ASPIRATION CYTOLOGY OF LUNG LESIONS: A STUDY OF 162 CASES

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### Abstract

A total 162 cases of Computed Tomography (CT) guided fine needle aspiration cytology (FNAC) of lung lesions were studied. Among them, 132(81.48%) were male and 30(18.52%) were female (M:F= 4.4:1) and most of the cases were above 55 years of life. Cytologically 133 (82.10%) cases were neoplastic and 29(17.90%) cases were non-neoplastic lesions. Out of 133 cases of neoplastic lesions, 77 (58.33%) cases were squamous cell carcinoma, followed by 26(19.70%) cases adenocarcinoma. In 29 non-neoplastic cases, 14(48.27%) cases were chronic inflammatory lesions. In conclusion, CT guided FNAC of lung lesion is a reliable procedure which yields adequate material for cytologic evaluation.

**Key Words:** CT; FNAC; Lung

### Introduction

Fine needle aspiration biopsy of lung lesions was first used 100 years ago<sup>1</sup>, but the procedure has become established in 1963 by Nordenstrom<sup>2</sup>. Fine needle aspiration cytology (FNAC) is a simple, speedy, safe, cost effective and accurate method<sup>3</sup>.

Fine needle aspiration biopsy/cytology is an outpatient method used for the evaluation of palpable masses. The assessment of deep seated, non-palpable lesions or focal lesions requires imaging methods, Computed Tomography (CT) in particular<sup>4</sup>. Image guided FNAC is well established diagnostic technique. This technique is valuable in obtaining rapid and accurate diagnosis<sup>5</sup>. CT guided FNAC of suspicious lung masses is a widely accepted, simple diagnostic method of relatively low cost, with negligible mortality and limited morbidity<sup>6</sup>. Imaging guided FNAC of the lung are performed routinely in many institutions throughout the United States<sup>7</sup>. Several reports have emphasized high specificity and sensitivity of CT guided FNAC of lung lesions and advocated for use instead of

biopsy as a useful and accurate diagnostic technique<sup>4,8,9,10,11</sup>. In Bangladesh, CT guided FNAC of lung is a newer technique which was available only in Dhaka. In Chittagong, it was introduced a few years ago. This study was done to observe the findings of CT guided FNAC of lung lesion in Chittagong.

### Materials and methods

From December, 2006 to September, 2008, FNAC of lung lesion was performed under CT guidance in 162 cases, attending in the Chittagong Medical College Hospital and private clinic/diagnostic laboratories in Chittagong. FNAC was performed according to the standard procedures<sup>3</sup> by a 10 ml disposable syringe with a disposable needle commonly used for spinal anaesthesia (22G/23G). The procedure were carried out under the guidance of a computed tomography apparatus. Smears were prepared by materials obtained and were fixed in 95% alcohol and stained by the Papanicolaou technique. The prepared slides were than examined under light microscope.

### Results

A total of 162 cases of lung lesions were aspirated under CT guidance. 132 males (81.48%) and 30 females (18.52%) (M:F= 4.4:1). Patient age ranged from 28 to 104 years with a large number of cases above 55 years of life, table I.

**Table I :** Distribution of age and sex of 162 patients

Sex	Age (years)						Total
	25-35	36-45	46-55	56-65	66-75	76 & above	
Male	06	11	22	47	28	18	132
Female	00	07	04	11	08	00	30
Total	06	18	26	58	36	18	162

FNAC were done in both lungs and table II shows distribution by site.

**Table II :** Lung lesion by site and sex

Sex	Site		
	Right lung(%)	Left lung (%)	Total(%)
Male	79(48.76%)	53(32.72%)	132(81.48%)
Female	19(11.73)	11(06.79%)	30(18.52%)
Total	98(60.49%)	64(39.51%)	162(100%)

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The diagnosis for the presence of neoplastic cells was negative in 29 cases (17.90%) and positive in 133 cases (82.10%). Out of 29 negative cases, most are the inflammatory lesions including granulomatous inflammation 07 (24.14%) cases, abscess/suppurative inflammation 06 (20.69%) cases, chronic inflammatory lesion 14(48.27%) cases and pneumonic consolidation 02(6.90%) cases. Out of 133 positive cases, 132 cases are malignant and 01 case is benign i.e. hamartoma. In malignant cases, 77(58.33%) cases were squamous cell carcinoma, 26(19.70%) cases adenocarcinoma, 08(6.10%) cases Non-Hodgkin lymphoma, 07(5.30%) cases large cell carcinoma, 07(5.30%) cases poorly differentiated carcinoma, 05(3.79%) cases malignant mesothelioma, 02 (1.51%) cases small cell carcinoma (Table II & IV).

**Table III :** Distribution of neoplastic disorders by sex

Sex	Squamous cell carcinoma	Adeno carcinoma	Non-Hodgkin lymph	Large cell carcinoma	Poorly differentiated carcinoma	Malignant mesothelioma	Small cell	Hamartoma carcinoma	Total
Male	68	21	05	05	05	03	02	01	110(82.70%)
Female	09	05	03	02	02	02	00	00	23(17.30%)
Total	77	26	08	07	07	05	02	01	133(100%)

**Table IV :** Distribution of Non-neoplastic lesion by sex

Sex	Chronic inflammation	Abscess/Suppurative inflammation	Granulomatous inflammation	Pneumonic consolidation	Total
Male	10	06	05	01	22(75.86%)
Female	04	00	02	01	07(24.14%)
Total	14	06	07	02	29(100%)

Among the neoplastic disorders, 76 cases (57.14%) involve the right lung and 57 cases (42.86%) cases involve the left lung (Table V).

**Table V :** Distribution of neoplastic disorders by site

Site	Squamous cell carcinoma (%)	Adenocarcinoma (%)	Other neoplastic disorders (%)	Total (%)
Right	41(30.83%)	17(12.78%)	18(13.53%)	76(57.14%)
Left	36(27.07%)	09(6.77%)	12(9.02%)	57(42.86%)
Total	77(57.90%)	26(19.55%)	30(22.55%)	133(100%)

**Discussion**

The accuracy of guided FNAC in the diagnosis of thoracic masses has been widely reported<sup>5</sup>. In our study, we see the findings of CT guided FNAC of lung lesions. In this study, neoplastic disorders in male 82.70% and female 17.30%, which corresponds to the study of AMMS Alam<sup>12</sup>. Age of

the most of the patients in this study is at fifties to sixties, which corresponds to the western countries<sup>12</sup>. In our study, most of the lesions (60.49%) involve right lung. Out of 162 cases, 82.10% neoplastic and 17.90% non-neoplastic lesions, which nearly correlates with JH stanelys<sup>7</sup> study as 78% neoplastic and 22% non-neoplastic lesions. In case of neoplastic lesions, most of the neoplasm are squamous cell carcinoma (57.90%), followed by adenocarcinoma (19.55%) which is nearly correlate with WHO study<sup>13</sup>.

**Conclusion**

CT guided FNAC of lung is a reliable procedure for evaluation of small lung lesions. It yields adequate materials for cytologic study which help to manage the patient immediately.

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