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Computed Tomography-Guided Fine Needle Aspiration Cytology of Intrathoracic Mass Lesions - A two years cross sectional study of 76 cases

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Abstract :
Background and Objective: *A vast spectrum of pathological lesions may present as intrathoracic masses. With CT guidance it is possible to perform a biopsy on almost any portion of thorax. The purpose of the present study is to evaluate the role of CT-guided FNAC in diagnosing various intrathoracic mass lesions in term of sensitivity, specificity and diagnostic accuracy.*
Material and Methods: *The lesions were localised by CT scan and aspirations were performed. Smears were routinely stained with Giemsa. Cell blocks were prepared from aspirated materials. Statistical Analysis was done using Epi Info™ version 7.*
Results: *Of total 76 cases, cytological examination revealed 60.0% positive for malignancy, 6.7% suspicious for malignancy and 29.3% cases negative for malignancy. The mean age of presentation was 64.3 years with slight male predominance for malignant lesions. Squamous cell carcinoma (SCC) (32.56%) was the most common malignant lesion. Sensitivity, specificity, and diagnostic accuracy of CT-guided FNAC were 97.1%, 80.0%, and 93.2% respectively ($p<0.0000018$). Pneumothorax, hemoptysis and transient pleuritic chest pain were the few complications encountered.*
Conclusion: *CT-guided FNAC is simple, safe and is a useful diagnostic tool for evaluation of intrathoracic mass lesions.*
Keywords: *Cell block, CT-guided FNAC, Intrathoracic masses, SCC*

I. Introduction

Lung cancer is the most common cancer in the world today (12.6% of all new cancers, 17.8% of cancer deaths (1-4) and the leading cause of cancer death in males in 2008 globally. Among females, it was the fourth most commonly diagnosed cancer and the second leading cause of cancer death. There were an estimated 1.6 million new cases and 1.4 million deaths in 2008. In the combined data from the series published in Cancer Incidence in Five Continents, small cell lung carcinomas (SCLC) comprise about 20% of cases and large cell /undifferentiated carcinomas about 9%. Squamous cell carcinomas (SCC) comprise 44% of lung cancers in men, and 25% in women, while adenocarcinomas (ADC) comprise 28% cases in men and 42% in women. Adenosquamous carcinoma, sarcomatoid carcinoma, carcinoid tumours, salivary gland tumours, mesenchymal tumours, lymphoproliferative tumours and metastatic tumours are other tumours of lungs. Mesothelioma is the most frequent neoplasm affecting the pleura and remains a major health threat for many years to come. Pleural mesotheliomas are largely seen in patients over 60 years of age, but the age distribution is wide and occasional tumours are observed in children. Primary effusion lymphoma, pyothorax-associated lymphoma, angiosarcoma, synovial sarcoma, solitary fibrous tumour, calcifying tumour of the pleura, desmoplastic round cell tumour are other tumours seen in the pleura. In most industrialized countries, greater than 90% of pleural mesotheliomas in men are related to prior asbestos exposure. Although the mediastinum is a relatively small anatomic compartment, the diversity of pathologic processes that may reside in it is impressive and a large variety of histological lesions may be found (5,6). Such lesions are both nonneoplastic and neoplastic, and they include proliferation of somatic epithelial, lymphoid, mesenchymal and germ cell types. With vast spectrum of pathological lesions in the intrathoracic cavity, it is a challenging task to diagnose these lesions, especially those which are deep seated, mediastinal and hilar regions, with high accuracy, safety and minimal morbidity to patients.(7) Imaging techniques are very helpful for detection and diagnosing these lesions but no imaging features are entirely specific for lung carcinomas/other primary malignant lesions. Except for few cases, it

would not be wise to do thoracotomy for diagnosis of intrathoracic lesions and there are many hazards associated with. Thoracotomy is contraindicated for small cell anaplastic carcinoma, metastatic tumors and infections. A confident diagnosis of benign lesions such as tuberculosis/chondroid hamartoma helps avoiding unnecessary surgical intervention. Additionally, a diagnosis of no malignancy in those who are at high operative risk, allow surgeon to operate without fear that it might be unnecessary or harmful. (8) Percutaneous transthoracic needle biopsy (TNAB) of lung is a well-established method in the cytologic diagnosis of pulmonary nodules. Haaga and Alfidi reported computed tomography (CT)-guided biopsy in 1976, and numerous reports since that time have shown TNAB procedures to be both effective and accurate (9) and is now widely accepted and is a simple, cost effective, safe, reliable diagnostic technique with high sensitivity and specificity for diagnosis of intrathoracic mass lesions. (10-15) With CT guidance it is possible to perform a biopsy on almost any portion of chest with high degree of safety and minimal morbidity because of ability to plan a needle path such that the major blood vessels are avoided. It has become the first line diagnostic procedure in diagnosing lung malignancies and confirming metastasis. It is also especially helpful in diagnosing mediastinal and hilar masses where major great vessels are present and deep seated in position. The diagnostic accuracy and sensitivity of transthoracic CT guided FNAC for malignant lesions in the literature ranges from 64% to 97% and 76% to 97% respectively. (16-18) Pneumothrax, hemorrhage, hemoptysis and chest pain are some common complications of the technique and only a few require active management.

The purpose of the present study is to evaluate the role of CT-guided FNAC in diagnosing various intrathoracic mass lesions in term of sensitivity, specificity and diagnostic accuracy.

II. Material And Methods

The present study was a cross sectional hospital-based study conducted in the cytology section, department of Pathology, Regional Institute of Medical Sciences (RIMS), Imphal, Manipur, a tertiary care hospital located in North Eastern India for a period of two years starting from October, 2011 to September 2013 in collaboration with the department of Radiodiagnosis, RIMS, Imphal. All patients presenting with undiagnosed intrathoracic mass lesions were included in the study. Those patients who cannot hold their breaths, patients having severe obstructive pulmonary disease, pulmonary artery hypertension, uncontrolled cough, bleeding disorders, bullous emphysema, suspected hydatid disease, arteriovenous malformation and dyspnea at rest were excluded from the study. Already diagnosed cases in follow-up stage were also excluded from the study. CT guided FNAC were conducted after explaining the risks and benefits of the procedure. The lesions were localized by CT scan (Brilliance CT, Philips Medical System [Cleveland], Inc. 595 Miner Rd. Cleveland, OH 44143 U.S.A) using contiguous 5 to 10 mm collimated images of the area of interest to map the path of the needle to the lesion. 22 gauze spinal needles were used for the aspirations. After the needle tip was confirmed to be in the desired location by taking limited CT cuts, aspiration were performed. After the procedure, the patient were placed in a puncture side down position and advised not to cough and talk for one hour of observation. Smears were made, air dried and some wet smears were immediately fixed with 95% ethyl alcohol. Slides were stained routinely with Giemsa, Papanicolaou (PAP), and other special stains such as mucin, periodic acid Schiff (PAS), Ziehl neelsen stain, Gram stain etc. were used whenever required. Cell pellets were prepared from aspirated materials and material remained in the needle and syringe by rinsing in 10 ml of 50% ethanol in 15ml disposable centrifuge tube. Cell pellets were processed in automatic tissue processor using a 13-hour processing schedule. Cell blocks thus prepared were cut into 3µm thick sections and routinely stain with Haematoxylin and eosin (H&E). According to cytomorphological findings, cases were reported into 3 groups as (i) positive for malignancy (PFM) when cytology showed diagnostically malignant cells (ii) suspicious for malignancy (SFM) when cytology showed atypical cells with no definite evidences of malignancy or too less cells to give a definite opinion (iii) negative for malignancy (NFM) when cytology did not reveal malignant cells or atypical cells but show only benign cells or nonspecific inflammatory cells. SFM cases were considered as malignant lesions for statistical analysis. Lung lesions are reported as small cell lung carcinoma (SCLC), non-small cell lung carcinoma (NSCLC), metastatic lesions when malignant cells were not consistent with the morphological features of lung carcinoma, and benign lesions. NSCLCs cases were further sub-classified as squamous cell carcinoma (SCC), adenocarcinoma (ADC), and undifferentiated large cell carcinoma (Undiff. LCC/NSCLC-NOS) etc. according to cytomorphology of malignant cells. Approval from the Institutional Ethical Committee, RIMS was taken at outset of study and recruitment into the study was done according to institutional guidelines. Written informed consents were taken from each and every case. Data were analyzed using Epi Info™ version 7. Fisher's exact probability test using Epi Info™ version 7 was applied for contingency tables with $p < 0.05$ considered significant.

III. Results

A total of 76 cases underwent CT-guided FNAC of various intrathoracic lesions. Sizes of various lesions ranged from 17mm to 100.8mm with mean size of 46.4mm (SD±17.9mm) in greatest diameter. 70 cases (92.1 %) were from lung lesions, 4 cases (5.26 %) from mediastinum and 2 (2.63 %) cases from pleura. As for lung lesions, 39 cases (55.7%) were on right side and 31 cases (44.3%) were on left side. Upper lobes were affected the most, right upper lobe (27.1%) being more than left upper lobe (25.7%). Of 4 mediastinal lesions, 2 cases were from anterior mediastinum and 2 from middle mediastinum while 2 cases from pleura were one each from right parietal pleura and left parietal pleura respectively. Out of total 76 cases, 56 (73.7%) cases were diagnosed radiologically (computed tomography) as malignant and 20 (26.3%) as benign lesions. Detail radiographic findings are given in Table 1.

Cytological examination revealed 48 cases (64.0%) positive for malignancy (PFM), 5 cases (6.7%) suspicious for malignancy (SFM) and 22 cases (27.3%) cases negative for malignancy (NFM). Concordance between the provisional radiological diagnosis and FNAC diagnosis as calculated by κ (kappa) coefficient were 0.709 (SE of κ ± 0.096; 95% CI: 0.532 - 0.885) for benign lesions and 0.796 (SE of kappa ± 0.079; 95% CI: 0.641 - 0.952) for malignant lesions.

Age range from 22 to 89 years with overall mean age of presentation was 64.34 years (SD ±12.3 years) and mode being 60 years. 88.2% cases were seen above 50 years of age with maximum number of cases were seen in age group 61-70 years (32.89%) for both the sex. The youngest patient was a 22 years old man presented with fever and cough and aspiration from the case showed non specific inflammatory lesion (NSIL). 35 cases (46.05 %) were males and 41 cases (53.95%) were female with male to female ratio of 1:1.2. Even though females have more number of cases, males (53.3%) had overall higher rate of malignancy for both intrathoracic and lung lesions than females (46.7%) with male to female ratio of 1.1:1. Considering only malignant lesions, most common age group affected were 71-80 years for males (41.7%) and 61-70 years for females (42.9%). Demographic description of the study is given in Table 1.

70 cases (92.1%) of intrathoracic mass lesions were from lungs. 43 cases (61.5%) were malignant lesions, 5 cases (7.1 %) SFMs and 22 cases (31.4 %) were benign lesions (BL). Out of 43 malignant lesions, 39 cases (90.7%) were primary pulmonary malignant lesions and 4 cases (9.30%) secondary metastatic lesions. SCC (32.56%) (Fig. 1 A,B,G) was the most common malignant lesion followed by NSCLC-NOS (20.93%) including undifferentiated large cell carcinoma. ADC (Fig. 1 C,D) and SCLC (Fig. 1 E) had same number of 8 cases (18.60%) each. For malignant lesions, maximum number of cases (40.0%) occurred in age group 71-80 years with maximum number of SCC and ADC occurred in age groups of 71-80 years and 61-70 years respectively. There were 4 cases (9.30%) of metastatic lesions with one case each of metastatic ADC, hepatocellular carcinoma, malignant peripheral nerve sheath tumor (MPNST) and malignant mesothelioma. Of 22 BLs, 19 cases (86.4%) were of non-specific inflammatory lesions comprising of 7 cases of acute inflammatory lesions (Fig. 2 A,B), 12 cases of chronic inflammatory lesions and 3 cases (13.6%) were tubercular lesions (Fig. 2 C,D). Cytological diagnosis of various lung lesions are given in fig. 3. Age and sex distribution of sub classification of malignant lung lesions are shown in Table 2.

One case of four mediastinal lesions was suboptimal for giving a definite opinion. There was one case (33.3%) each of Non Hodgkin's lymphoma (NHL), malignant peripheral nerve sheath tumor (MPNST) and anaplastic carcinoma. NHL case was a 88 years old male presented with cough, shortness of breath and fever off and on. MPNST case was a 42 years old male with history of operated soft tissue sarcoma of thigh. Of two (2.6%) pleural lesions, one case was malignant mesothelioma from a 70 years old female presented with chronic cough. Another case was a known case of lymphoma involving the pleura. Pathological spectrum of various intrathoracic mass lesions based on cytomorphological findings is given in Table 3.

A total of 44 cell blocks (CB) were prepared from the aspirated materials. Considering CB diagnosis as standard, sensitivity, specificity and diagnostic accuracy of CT-guided FNAC of intrathoracic malignant lesions were 97.1%, 80.0% and 93.2% respectively ($p < 0.0000018$; $F = 24.3080$) (Table 4).

Pneumothorax (1/76; 1.3%), hemoptysis (6/76; 7.9%) and transient pleuritic chest pain (4/76; 5.3%) were the complications encountered during the study period. The pneumothorax developed in a 56 years old female patient who was presented with right upper lobe mass admitted in the chest ward for evaluation and chest tube insertion (1.3%) was done as patient developed respiratory distress. None of other cases required active management.

IV. Discussion

Intrathoracic mass lesions are common radiological findings that poses relatively frequent clinical problem. A solitary pulmonary nodule is a common manifestation of a benign condition but nodules larger than 2 cm, the incidence of a primary lung cancer ranges from 64 to 82% (19,20). An early, accurate diagnosis is of paramount importance for initiating specific therapy for malignant lesions, and for avoiding unnecessary procedures for benign conditions. And exact subtyping of NSCLC is now crucial owing to current treatment

regimens and emergence of evidence based medicine. Direct tissue sampling for diagnosis is essential in most patients for decisions regarding treatment and can be accomplished by fine needle aspiration biopsy (FNAB), endoscopic or core needle biopsy, or surgical resection. FNAB is least invasive, simple, safe, and a reliable diagnostic technique with high sensitivity and specificity. This technique is now useful not only for diagnosis and classification but also for investigation of prognostic and predictive biomarkers, and use of ancillary techniques by proper retrieval of aspirated materials. Immunohistochemical studies on cell block preparation with a limited panel of TTF-1, CK 7, CK5/6, and p63 together with a mucin stain, can refine diagnosis of NSCLC to either ADC or SQC. (21,22) Cough, Cough with hemoptysis and shortness of breath were the most common presenting symptoms in patient with intrathoracic mass lesions. Weight loss, chest pain, chest discomfort and fever were also not uncommon. General weakness and loss of appetite were less common symptoms.

Age range from 22 to 89 years with overall mean age of presentation was 64.34 years (SD ±12.3 years) and mode being 60 years with maximum number of cases seen in age group 61-70 years (32.89%). Shanker E.J. et al. (11) and Basnet S.B. et al.(12) also reported similarly while Saha A. et al.(23) reported peak incidence in 5th decade. Males (53.3%) had overall higher rate of malignancy for both intrathoracic and lung lesions than females (46.7%) with male to female ratio of 1.1:1. Similar findings were reported by previous studies.(10-12,16)

We had 70 cases (92.11 %) from lung lesions, 4 cases (5.26 %) from mediastinum and 2 (2.63 %) cases from pleura. Basnet SB et al.(12) and Bandyopadhyay A et al.(13) had comparable findings. As for lung lesions, we found more cases on right side (55.7%) than on left side (44.3%). Shanker E.J. et al.(11) also reported similar findings. Upper lobes were the most common biopsied sites. Saha A. et al.(23) also reported comparable findings.

Of 70 cases of lungs lesions, 43 cases (61.5%) were malignant lesions, 5 cases (7.1 %) SFMs, and 22 cases (31.4 %) were BLs. Out of malignant lesions, 39 cases (90.7%) were primary pulmonary malignant lesions and 4 cases (9.3%) secondary metastatic lesions. Prashant et al.(16) and Emara M.M et al.(24) also reported similar findings however later reported a higher rate of metastatic lesions (16.66%). SCC (32.56%) was the most common pulmonary malignant lesion in our study. Similar to our finding, Shanker E.J. et al. (11), Basnet S.B. et al.(12) and Saha A. et al.(23) also reported SCC as most common malignant lesion in their studies. In contrast to our finding, Madan M. and Banner H. (25) and Gangopadhyay M. et al.(26) reported ADC as most common malignant lesions. Western literatures (1-3) also reported ADC as the most common primary lung carcinoma. These differences may be due to regional differences and smoking habits of various populations and need further studies. NSCLC-NOS (20.93%) including undifferentiated large cell carcinoma was the second most common lesion. Similar to our finding, Emara M.M. et al.(24) and Kocijančič I and Kocijančič K(27) reported higher cases of NSCLC-NOS. We had same number as ADC and SCLC (18.60%). This finding is comparable to finding by Rangaswamy M et al. (28) (17.02%). Mukherjee S et al.(29) (26%) reported higher number of SCLC. There were 4 cases (9.30%) of metastatic lesions. This finding is comparable with finding by Shanker EJ et al. (11). JP Singh et al. (9)(44.4%) reported higher number of metastases while Parajuli S et al. (30)(4.9%) reported a lower rate. Of 22 BLs, we had 19 cases (28.4%) of non-specific inflammatory lesions comprising of 7 cases of acute inflammatory lesions, 12 cases of chronic inflammatory lesions and 3 cases (4.5%) of tubercular lesions. This finding is comparable with those reported by Basnet SB et al.(12) in which they had 24% of NSIL and 5% of tubercular lesions. We had a few cases of mediastinal (5.3 %) and pleural lesions (2.6%). In similar to our finding, Basnet SB et al.(12) had 6% and Saha A et al.(23) 5.26% mediastinal cases. Bandyopadhyay A et al.(13) reported higher number of mediastinal lesions (11.6%) but had 2.5% of pleural lesions similar to our finding.

We found good concordance between the initial radiological diagnosis and FNAC diagnosis with κ coefficient of 0.653 (SE of kappa ± 0.096) for benign lesions and 0.716 (SE of kappa ± 0.081) for malignant lesions. Basnet SB et al.(12) report similar findings. We had high diagnostic sensitivity (97.1%) and a little low specificity (80.0%) for detecting malignant lesions ($p < 0.0000018$). Shanker EJ et al. (11) reported diagnostic sensitivity for bronchogenic carcinoma as 84% and specificity 76% while Bandyopadhyay A et al. (13) reported diagnostic sensitivity of 97.7% & specificity of 100% for malignancy. The reported diagnostic accuracy of CT – guided FNAC of intrathoracic and pulmonary lesions in the literature ranged from 64-97%. Shanker E.J. et al.(11) reported a diagnostic accuracy of more than 90%. We had a diagnostic accuracy of 93.2%.Yadav R.K. et al. (10) and Basnet SB et al.(12) reported diagnostic accuracy of 88.57% and 82% respectively.

Pneumothorax (1.3%), hemoptysis (7.9%) and transient pleuritic chest pain (5.3%) were the complications encountered during the study period. We had overall low rate of complications with chest tube insertion rate of 1.3%. Kocijančič I and Kocijančič K (27) found pneumothorax rate of 27.2% and the chest tube insertion rate 4.5%. Li H et al.(31) reported chest tube insertion rate of 2%. This low rate of chest tube insertion in our study may be likely due to use of smaller size needle (maximum aspiration with 22G), less number of

multiple passes and pneumothorax precautions like discouraging the patient not talk and cough, puncture site down positions. None of other cases required active management.

V. Figures And Tables

Table 1. Detailed Radiological Findings and Demographic Description of the Study

Site of lesions	Frequency	Percent	95% CI Lower	95% CI Upper
Lung	70	92.11	83.60	97.05
Mediastinum	4	5.26	1.45	12.93
Pleura	2	2.63	0.32	9.18
Location in Lung				
Right Upper Lobe	19	27.14	17.20	39.10
Right Middle Lobe	10	14.29	7.07	24.71
Right Lower Lobe	10	14.29	7.07	24.71
Left Upper Lobe	18	25.71	16.01	37.56
Left Lower Lobe	13	18.57	10.28	29.66
Needle Approach				
Supine	55	72.37	60.91	82.01
Prone	21	27.63	17.99	39.09
Number of Punctures				
1	52	68.42	56.75	78.61
2	18	23.68	14.68	34.82
3	6	7.89	2.95	16.40
Radiological Diagnosis				
Malignant lesion	56	73.68	62.32	83.13
Benign lesion	20	26.32	16.87	37.68
Age group (years)				
21-30	2	2.63	0.32	9.18
31-30	2	2.63	0.32	9.18
41-50	5	6.58	2.17	14.69
51-60	19	25.00	15.77	36.26
61-70	25	32.89	22.54	44.63
71-80	19	25.00	15.77	36.26
81-90	4	5.26	1.45	12.93
Sex				
Male	35	46.05	34.55	57.87
Female	41	53.95	42.13	65.45
Total	76	100.00		

Table 2. Sex and Frequency Distribution Lung Carcinoma

Sub-diagnosis of Lung Carcinoma	Male	Female	Frequency	Percent
SCC*	6	8	14	32.56 %
ADC†	2	6	8	18.60 %
SCLC‡	5	3	8	18.60 %
NSCLC-NOS§	7	2	9	20.93 %
Metastatic Lesions	2	2	4	9.30 %
TOTAL	22	21	43	100.00%

*Squamous Cell Carcinoma; †Adenocarcinoma; ‡Small Cell Lung Carcinoma; §Non-Small Cell Lung Carcinoma-not otherwise specified

Table 3. Pathological spectrum of Intrathoracic mass lesions based on cytomorphological findings

Site of lesion	Nature of lesions	Sub-category of lesions	No. of cases	Percentage
Lung	Total		70/76	92.1
	Malignant (43/70)	SCC*	14	18.4
		ADC†	8	10.5
		SCLC‡	8	10.5
		NSCLC-NOS§	9	11.8
		Metastatic	4	5.3
	Benign (22/70)	NSIL‖	19	25.0
		TBL¶	3	3.9
Mediastinum	Total		4/76	5.3
	Malignant	NHL**	1	1.3
		Metastatic	1	1.3

		AC[††]	1	1.3
	Inconclusive	------	1	1.3
Pleura	Total		2/76	2.6
	Malignant	NHL	1	1.3
		MM[‡‡]	1	1.3

*Squamous Cell Carcinoma; [†]Adenocarcinoma; [‡]Small Cell Lung Carcinoma; [§]Non-Small Cell Lung Carcinoma-not otherwise specified; [‖]Non specific inflammatory lesion; [¶]Tuberculous lesion;**Non Hodgkin lymphoma ; [††]Anaplastic carcinoma; [‡‡]Malignant Mesothelioma

Table 4. Association of Cytological diagnoses and Cell Block Diagnoses

	Cell Block Diagnosis			Significance	
Cytology Diagnosis	PFM	NFM	Total	F	*p*
PFM*	33	2	35	24.3080	< 0.0000018
NFM[†]	1	8	9		
Total	34	10	44		

*Positive for Malignancy; [†]Negative for Malignancy

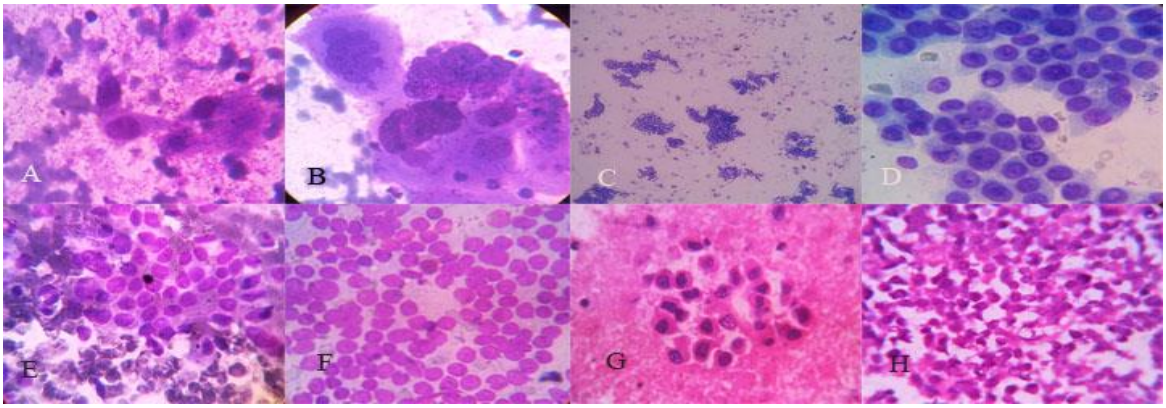

Figure1. A. Photomicrograph of SCC showing malignant squamous caudate cells with extensive necrosis in the background, highly pleomorphic cell with hyperchromatic nuclei and high N:C ratio, x100; B. Photomicrograph showing malignant tumor giant cells from another case of SCC x400; C. Photomicrographs from 78 year old female ADC case showing highly cellular smears with flat monolayer sheets; Giemsa, x100; D. Photomicrograph of high power magnification of C, cells showing delicate cytoplasm, round to oval eccentric nuclei with prominent central nucleoli; Giemsa, x1000; E. Photomicrograph of SCLC showing loose cluster of tumor cells having scanty cytoplasm, coarsely granular nuclear chromatin, nuclear moulding, inconspicuous nucleoli; Giemsa, x400; F. Photomicrograph of NHL from a 88 years old male Giemsa, x400; G,H. Cell block preparations of SCC (G) and NHL (H) corresponding to figures A and F respectively

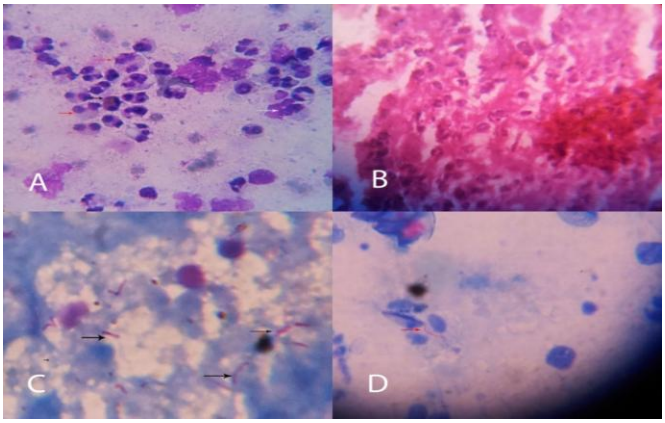

Figure 2. Benign lesions A. Photomicrograph of a case of Non-specific inflammatory lesions showing polymorphonuclear cells (red and black arrow) and occasional macrophages (white arrow); Giemsa, x1000 B. Cell block preparation from the same case A showing mainly polymorphonuclear cells; H&E, x400 C. Photomicrograph of a tuberculous lesion showing extensive necrosis and multiple acid fast bacilli (arrow); Ziel

Nielsen stain, x1000 D. Photomicrograph of another tuberculous lesion showing intracellular acid fast bacillus; Ziel Nielsen stain, x1000

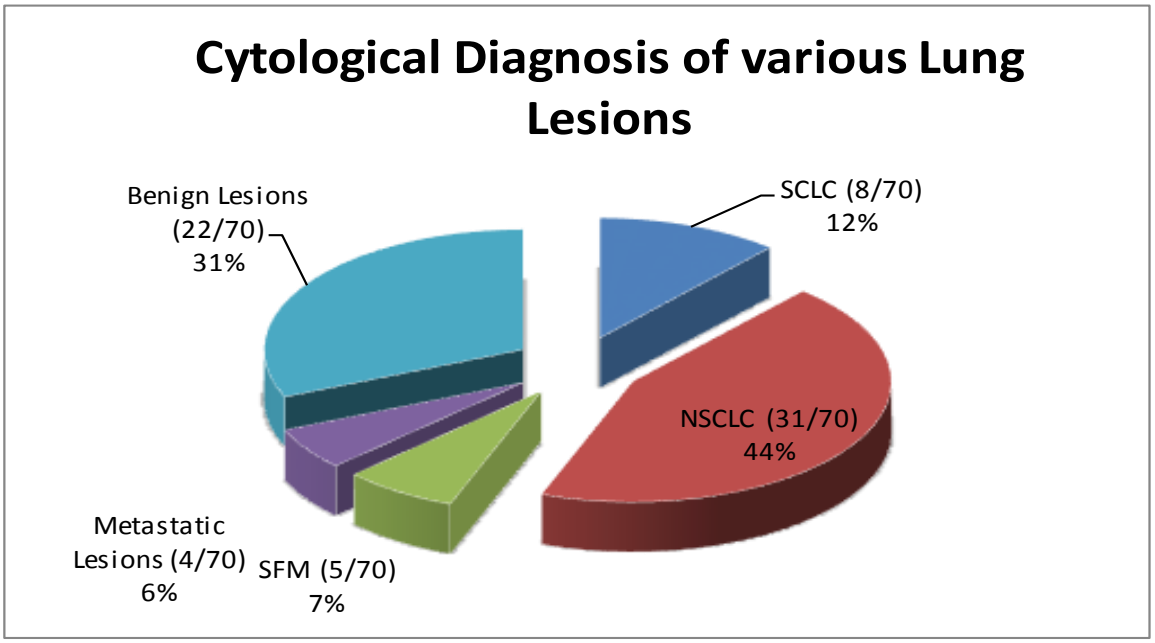

Figure4. Cytological Diagnosis of various Lung Lesions. SCLC- Small Cell Lung Carcinoma; NSCLC – Non-Small Cell Lung Carcinoma; SFM – Suspicious for Malignancy;

VI. Conclusion

CT-guided FNAC of intrathoracic mass lesions is relatively low cost, simple, safe and has a high sensitivity and diagnostic accuracy for detecting neoplastic lesions. It is a useful diagnostic tool for evaluation of intrathoracic mass lesions with a few acceptable complications like pneumothorax, hemoptysis and transient pleuritic chest pain. Only a few cases required active management. Inclusion of cell block preparation from FNAC material in the present study help in reducing the number inconclusive diagnosis and special stains like mucin stain, PAP stain and PAS stain and ancillary technique inmmuperoxidase stains can be done with the same tissue material allowing comparative study.

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