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ROLE AND ACCURACY OF RAPID ON-SITE EVALUATION OF CT: GUIDED FINE NEEDLE ASPIRATION CYTOLOGY OF THORACIC LESIONS

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ABSTRACT: Computed tomography guided percutaneous transthoracic fine needle aspiration cytology (FNAC) of thoracic lesions is a widely accepted, simple, rapid, safe and accurate diagnostic tool of relatively low cost. **OBJECTIVE:** The aim of this study was to evaluate the diagnostic value of the noninvasive method of CT-guided needle aspiration cytology in the assessment of radiologically detected intra thoracic mass lesions, to analyze the results and to know the pathological spectrum of thoracic masses (both benign and malignant) along with the correlation of CT findings with cytopathological reports. **SETTINGS AND DESIGN:** We conducted an institution based prospective study on patients who presented with thoracic mass lesions in lungs, mediastinum, hilar lymph nodes, thoracic vertebrae, paraspinal soft tissues and pleura. Cytologic examination was performed on site after staining smears with the Hematoxylin and eosin method. It was possible to define the cytologic lineage in 94 percent of the cases and in 3 cases (5.4 percent) the material was insufficient for the cytologic diagnosis. The diagnostic accuracy of percutaneous transthoracic fine needle aspiration cytology was more than 90%. Out of 52 cases, 11 cases were non-neoplastic while 41 cases were neoplastic. Among the non-neoplastic lesions, specific diagnosis were obtained in 10 cases. The diagnostic sensitivity of malignancy was 92.5% and specificity was 100%, positive predictive value of 100 percent and negative of 80 percent. Male to female ratio was 2.9:1. Majority of cases was seen in 5th to 6th decade. The most common tumor was squamous cell carcinoma (44.82%) followed by adenocarcinoma (31.03%) Post procedural complications were few. **CONCLUSIONS:** This study showed that FNAC, under computed tomography guidance, is a simple, rapid, safe, sensitive and specific technique procedure with insignificant rate of complications for the diagnosis of thoracic lesions. It can be used as a first line of investigation and also helps in deciding on appropriate management.

KEYWORDS: Transthoracic fine needle aspiration cytology (FNAC), Computed tomography (CT), Thoracic lesions, Lung cancer.

INTRODUCTION: CT-GUIDED fine needle aspiration cytology (FNAC) of thoracic lesions is a widely accepted, rapid, simple diagnostic method of relatively low cost, with negligible mortality and limited morbidity.¹ The thoracic lesions will always be an enigma for clinicians worldwide. For thoracic lesions a documentary evidence of the nature of pathology is necessary before institution of therapy and also for prognosis. Thoracic lesions include lesions of lung, pleura, mediastinum and vertebrae. Many techniques have been used in the diagnosis of intra-thoracic lesions. The imaging techniques used for transthoracic FNAC include fluoroscopy, ultrasonography and computed tomography.

CT-guided FNAC plays a valuable technique in small thoracic lesions and deep mediastinal nodes in which needle placement is correctly possible by avoiding any surrounding blood vessels and

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adjacent cardiac structures.² Inflammatory processes and other benign lesions may be diagnosed by this method but the main indication remains the diagnosis of suspected malignant intrathoracic lesions.³

CT guided FNAC plays an extremely vital role where sputum is unavailable and location of the lesion or general condition of the patient is not suitable for broncoscopic procedures. In patients with lung cancer that is inoperable owing to local factors or the patient's general condition, FNAC confirms the diagnosis and reveals the tumor type.

In cases of malignancy of the lungs, cytopathological examination of material obtained by CT-guided FNAC offers a rapid and specific diagnosis which helps in deciding the therapeutic approach in patients. The reported accuracy in the literature ranged from 64% to 97%.⁴

On the other hand, post procedure complications are fewer except for pneumothorax, pulmonary hemorrhage, and hemoptysis in a small percentage of cases. Severe chronic obstructive pulmonary disease, bleeding diathesis, and pulmonary arterial hypertension are the relative contraindications. CT-guided FNAC offers a quick and specific diagnosis which helps clinicians implement appropriate anticancer measures like chemotherapy and radiotherapy.⁵

The presence of a cytopathologist at the time of FNAB, to confirm that diagnostic material has been obtained, has been shown to improve diagnostic yield because immediate cytologic assessment of a specimen results in a high level of adequacy and accuracy of the sample without increasing the complication rate.⁶

We therefore performed a prospective study to analyze the age, sex and topographic distribution and cytopathological diagnosis of thoracic mass lesions using CT-guided FNAC and to evaluate diagnostic accuracy, safety and usefulness of cytology in CT-guided FNAC in the diagnosis and management of thoracic lesions.

MATERIAL AND METHODS: Our study is a hospital based prospective study & carried out in the setting of Department of Pathology and MP M.R.I. & C.T. Scan Center, NSCB Medical College Jabalpur for a period of one year from September 2011 to October 2012. Patients with thoracic lesions which were detected clinically or under radiological guidance, presented to the department of cytology.

Thoracic organs including the lung, pleura, mediastinum, hilar lymph node, thoracic vertebrae and paraspinal soft tissue were included in the study. Parietal swellings arising from the skin, chest wall, breast and bone were excluded from the study. The inclusion criteria of this study were patients with thoracic lesions, who are cooperative & able to hold breath and have no bleeding tendency or coagulopathy. Patients with bleeding disorders or abnormal coagulation profile, severe COPD, unable to hold breath or having pulmonary artery hypertension or contralateral pneumonectomy were excluded from the study.

After thorough clinical history, examination, relevant hematological and biochemical investigations, informed consent was obtained from the patients. Plain & contrast C.T. of chest is to be done prior to C.T. guided aspiration. CT guided FNAC was carried out as an outpatient procedure after explaining the risks and benefits.

First, an axial scan of area of interest was done to locate the lesion and to plan the best approach (Supine or prone). Patient positioning was based on the shortest distance from the lesion to the visceral surface and the skin puncture site was marked with a radio opaque marker. Under all aseptic precautions FNAC was carried out using with 22 -gauge disposable lumbar puncture

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needle. With the tip of the needle located in the outer edge of the lesion, a repeat slice of the area of interest was taken to check the exact position of its tip.

The stylet was then withdrawn 2-3 cms and the needle was advanced into the mass with a rotating motion during suspended respiration. 10ml syringe is attached to the needle's hub and the plunger is pulled back and the aspiration was done under negative pressure. Immediate cytological assessment was performed by an onsite cytopathologist.

The aspirate is smeared on slides, air dried and stained with Leishman-Giemsa and smears fixed in 95% alcohol were stained with Hematoxylin and Eosin [H & E] stain or Papanicolaou [PAP] stains for cytological evaluation.

All patients were kept under observation after the procedure and a repeat CT scan was taken to rule out pneumothorax or any other complications.

The study group were analyzed, based on the cytological features. Cytologic diagnosis followed the World Health Organization classification. The final diagnosis was arrived at in corroboration with clinical, radiological and cytological features. The smears were classified into non-neoplastic /benign, malignant and unsatisfactory for interpretation.

STATISTICAL ANALYSIS: Data was compiled and statistical analysis was done by using the SPSS (Statistical package for the social sciences) program. Quantitative variables are expressed as mean $\pm$ standard deviation and qualitative variables as percentages. Statistical tests applied included diagnostic tests for sensitivity and specificity. Sensitivity and specificity were worked out with respect to the imaging technique (CT) used.

RESULTS: Our study was based on examination of fifty –five cases, of which 41 were males and the remaining 14 females. The male to female ratio was 2.93:1. The mean age of presentation was 51.22($\pm$ 16.40) for males and 48.00($\pm$ 15.55) years for females. The age group of the patients in the study ranges from 16 to 80years. The youngest of patients was a female of 16 years and the oldest a male of 80 years. Maximum number of patients (40) was in the age group of 40-69 years, accounting for 72.73% of total sample. The demographic features of the group of patients undergone the study is tabulated as below as [Table 1].

Most common presenting feature was unexplained cough and expectoration in 49.1% of the patients, followed by chest pain in 47.3% then 20% with breathlessness. Hemoptysis was reported in 12.7% and weight loss in 10.9% of the cases. The history of smoking was present in 83.63% (46) of all cases.

In our study, the radiological location of intrathoracic lesions was lung parenchyma in 37 patients (67.3%), mediastinal in 9 patients (16.4%), thoracic vertebrae in 3 patients (5.5%) and 2(3.6%) each in hilar, pleural and paraspinal regions. [Table2]. Out of 55 cases of thoracic mass lesions, definitive cytological diagnosis could be obtained in 52 cases and the rest 03 cases were inconclusive. Among 52 cytologically proven cases, the malignant lesions 40(72.72%) were predominant while 12(21.81%) were benign.

The benign lesions, studied were diagnosed as Acute inflammatory lesion (Organized abscess), Chronic non specific inflammatory lesion, Tubercular Granulomatous lesion and Hematoma. The acute inflammatory lesions showed intense inflammatory cells chiefly neutrophils, macrophages,

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fibrin and degenerated necrotic background. Granulomatous lesions which along with epithelioid cells and AFB positivity were classified as tubercular infection. [Table 3]

The incidences of malignant lesions in both sexes were high. [Males n=31, (75.6%), females n=9, (64.2%)] There were 30 lung parenchymal tumors of which 18 were found in right lung and 12 were found in left lung. The most common site of tumors in lung were upper zone in 11 cases, 9 cases in parahilar region, 6 in midzone region and 4 cases in basal zone. Among bronchogenic malignancies, 'squamous cell carcinoma' was the most common type accounting for 13(43.33%) cases followed by 'adenocarcinoma' with 09 cases (30%), and 'bronchoalveolar', accounting for three cases(10%). There were two cases (6.67%) of 'large cell type', one each of 'small cell carcinoma' (3.3%) and 'poorly differentiated carcinoma' (3.3%). There is only one case (3.3%) of metastatic deposits carcinoma breast. [Table 4]

We had one patient with hilar lymphadenopathy, proven to be NHL on aspiration. Out of the 6 malignant mediastinal lesions, the predominant diagnosis was metastatic deposits (04 cases) from epithelial cell origin and two cases of NHL. Of the metastatic lesions three cases of metastatic adenocarcinoma, one case of metastatic Squamous cell carcinoma. Two cases pertained to pleural lesions, one was benign fibrous tumor and the other was malignant mesothelioma.

On aspiration from paraspinal region, we had one case of metastatic deposit from carcinoma stomach (adenocarcinoma).

Out of the three vertebral lesions, two cases were benign and one was metastatic deposit from carcinoma prostate on aspiration

Post procedural complications: All the patients under the study tolerated the diagnostic procedure well. The most common complaint was pain at the puncture site, which lasted for a few hours (3-6 hours) and subsided without medication. Pneumothorax occurred in two patient and pulmonary hemorrhage in 2 cases. In all four cases, the patients were kept under strict observation for any deterioration. None of these patients required any active management.

The overall diagnostic accuracy of the procedure C.T. guided FNAC was 94.2%. The accuracy was worked out for all the intrathoracic lesions based on the ability of cytology to match the histopathological diagnosis Provisional diagnosis based on CT findings were 37 lesions were malignant and 15 lesions were benign while cytological examination showed that 40 cases were malignant and 12 cases were benign.

The ability to distinguish benign from malignant was the basis for calculating sensitivity and specificity. Sensitivity of C.T. guided FNAC in our study was found to be 92.5% and specificity as 100%, Positive predictive value was 100% and Negative predictive value was 80%.

DISCUSSION: CT-guided fine-needle aspiration cytology (FNAC) of intrathoracic lesions has been shown to be a cost-effective method of diagnosis, reducing hospitalization, lowering costs and a reduction in diagnostic thoracotomy and in studies using decision analysis. Lesions of all size and inaccessible sites including mediastinum and deep hilar are easily sampled thus increasing accuracy.

When there is effective interaction between radiologists and pathologists the yield of cellular material is increased. An immediate evaluation of specimen at the time of the FNAC procedure by cytopathologist, along with further passes when necessary, improves the adequacy rate of the

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technique which is of great help in guiding as well as expediting subsequent diagnostic and therapeutic measures and in reducing costs.⁷

The age of the patients in our study was in the range of 16 to 80 years. Maximum number of patients were in the age group of 40-69 years, accounting for 72.73% of the studied cases, 29% in the age group of 60-69 years. The mean age in our study was 50.40 ($\pm$ 16.11) years. The peak age of incidence (60-69 years) in our study is observed in other studies like Jayashankar et al⁸ and Mukherjee S⁹ had the same peak age group of incidence.

The increased number of cases in the age group of 60-69 years may be due to increased incidence of malignancies in that group and also because FNAC was mainly used for the diagnosis of neoplasm, which comprises (72.72%) of the total cases. Maxcy Roseau's¹⁰ last study indicated that an exponential increase in the incidence rates with age is observed for most adult malignancies. This is true as increased number of malignant cases is seen in the elderly population.

In the present study, out of 55 cases 41 were men (74.5%) and 14 are women (25.45%) with a Male: Female ratio of 2.9: 1, which is quite comparable to studies by Anupam Saha et al¹¹ where male were 78.9 %, Jayashankar et al⁸ (70%), Rangaswamy et al¹² where this ratio was 2.6:1.

In our study the most common clinical presentations was cough (49%) followed by chest pain (47%), breathlessness (20%), fever (18%) and haemoptysis which is well correlated with a study done by Jayashankar et al.⁸

Regarding the side of the lung parenchyma lesions majority were on the right side 18 cases (59%). This is comparable with other published studies^{5 & 15} When we analyzed the distribution of cases showed that majority were from lung parenchyma 37(67.27 %) followed by mediastinum 9(16.4%), thoracic vertebrae 3(5.5%), hilar 2(3.6%), pleural 2(3.6%) and paraspinal 2(3.6%) region. The predominance of pulmonary lesions over other thoracic masses has been seen in other studies done by Singh et al⁵ (64.7%) and R. N. Sarjer et al¹³ (67%).

However greater share of studied lesions came from lung in the studies conducted by Basnet et al¹⁴ (91%), Jayashankar et al⁸ (92%), S Kalhan et al¹⁶ (92%) and Anupam Saha et al¹¹ (94.7%).

Cytological study showed malignant pathology in 72.72% of cases and benign pathology in 21.81% cases. The incidence of malignancies has been seen in other studies ranging from 62.5% to 96.5%.¹⁶ The prevalence of malignancy in our study is significantly less than the 81.8% found in similar study done by Singh et al.⁵

In the present study, the benign lesions, studied were of types Acute Inflammatory Lesion (Organized Abscess), Chronic Non Specific Inflammatory Lesion, Tubercular Granulomatous Lesion and Hematoma. CT guided FNAC is useful for diagnosis of pulmonary infections, similar findings are stated by Cones et al¹⁷ and Rangaswamy et al¹² In inflammatory lesions, by integrating other ancillary techniques like special stains such as Grams stain, AFB stain, culture, immunocytochemistry and PCR can help arrive at a specific diagnosis.

In our study, among bronchogenic malignancies prevalence of 'Squamous cell carcinoma' and 'adenocarcinoma' was found to be 44.8% and 31.0 % respectively which is comparable to studies done by Anupam S¹¹ et al, Basnet et al¹⁴ and Jayashankar⁸ et al however preponderance of adenocarcinoma has been seen in studies done by Gangopadhyay, et al¹⁸ and S Kalhan¹⁶ et al.

Out of the eight mediastinal lesions, the predominant diagnosis was metastatic deposits (04 cases) from epithelial cell origin followed by two cases of NHL and one case each of Acute and Chronic Inflammatory Lesion. The most malignant mediastinal lesions were metastatic. Our results

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agree with Powers et al.¹⁹ CT guided percutaneous FNAC makes it possible to carry out a diagnosis of most mediastinal lesions with a very high reliability.

Tolerance of C.T. guided FNAC by patients is good. The post procedural complications were minimal. The most common complaint observed was pain at the puncture site, which lasted for a few hours and subsided without medication. Pneumothorax occurred in two patient and pulmonary hemorrhage in 2 cases. In all four cases, the patients were kept under strict observation for any deterioration. None of these patients required any active management, this was same as studied by Basnet et al¹⁴ and Jayashankar et al.⁸ Pneumothorax was significantly lower than the 11.8% seen in the studies conducted by Singh et al⁵ respectively. It was comparable similar to the 2.7% and 1.1% of Gupta et al²¹ and Mohammad et al.⁴

The reported diagnostic accuracy of CT –guided lesions in the literature ranged from 64% to 97%⁴, Sensitivity has been found to be in the range of 88% to 97.7 % and Specificity from 84% to 100%.^{5, 14, 16} The present study found a diagnostic accuracy of 94.2%. Sensitivity of our study is found to be 92.5%, suggesting high usefulness of CT guided FNAC in diagnosis of malignancy of tumors. Indicative diagnosis by CT is validated by FNAC by 100% 'specificity' recorded in our study. The results of diagnostic accuracy, sensitivity and specificity of CT-guided aspiration cytology are comparable to most of the published studies as given in Table 5.

CONCLUSION: CT guided transthoracic FNAC is a relatively simple, low cost, quick, safe, well tolerated and minimally invasive procedure. This method has a high sensitivity for the detection of malignancy when carried out by experts and has less risk of complications.

It is a reliable method with high diagnostic accuracy, high sensitivity and specificity, in diagnosis and cell typing of thoracic lesions. Therefore, it should be considered the diagnostic procedure of first choice for management of thoracic lesions and major surgical procedures like thoracotomy, for diagnostic purposes can be avoided.

The use of immediate cytologic assessment at our institution has resulted in improved patient care by enabling immediate selection of additional diagnostic tests to render more specific pathologic diagnosis. These advantages have led to the installation of permanent facilities for the processing of specimens in the department of diagnostic radiology where cytopathologists now perform the FNAC of lesions.

Thus, we conclude that Transthoracic CT-guided FNAC is a simple, relatively safe procedure with minimal complications and high diagnostic accuracy in evaluation of malignant or benign intrathoracic lesions.

REFERENCES:

1. Veale D, Gilmartin JJ, Sumerling MD, et al. Prospective evaluation of fine needle aspiration in the diagnosis of lung cancer. *Thorax* 1988; 43: 540-44
2. Van Sonnenberg E, Casola G, Ho M, et al: Difficult thoracic lesions: CT guided biopsy experience in 150 cases. *Radiology J* 1988, 167: 457-461.
3. Arslan S., Yilmaz A., Bayramgurler B., Uzman O., Unver E., Akkaya E.: CT-guided transthoracic fine needle aspiration of pulmonary lesions: accuracy and complications in 294 patients. *Med Sci Monit* 2002, 8: 493-497.
4. Mohammad G. M.: CT guided fine needle aspiration cytology in the diagnosis of thoracic lesions. *JIMA* 2001; 99(10): 1-5.

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5. Sing JP, Garg L, Setia V.: Compared tomography (CT) guided transthoracic needle aspiration cytology in difficult thoracic mass lesions – not approachable by USG. *Indian J Radiol Imaging*. 2004; 14: 395–400.
6. Austin JHM, Cohen MB. Value of having a cytopathologist present during percutaneous fine needle aspiration biopsy of lung: report of 55 cancer patients and metaanalysis of literature. *AJR Am J Roentgenol* 1993; 160: 175 – 7.
7. Stewart CJ, Stewart IS. Immediate assessment of fine needle aspiration cytology of lung. *J ClinPathol* 1996; 49: 839-43.
8. Jaya Shankar E., Pavani B., Chandra E., Reddy R., Srinivas M, et al: Computed Tomography Guided Percutaneous Thoracic: Fine Needle Aspiration Cytology in Lung and Mediastinum. *J CytolHistol*, (2010), 1: 107
9. Mukherjee S, Bandyopadhyay G, Bhattacharya A, Ghosh R, Barui G, Karmakar R. Computed tomography-guided fine needle aspiration cytology of solitary pulmonary nodules suspected to be bronchogenic carcinoma: Experience of a general hospital. *J Cytol* 2010 ; 27: 8-11
10. Maxcy Rosenau-last: Public health and preventive medicine. Appleton and Lange; 1993.
11. Anupam S, Kshitish K, Manoj KC. Computed tomography-guided fine needle aspiration cytology of thoracic mass lesions: A study of 57 cases. *J Cytol*. 2009; 26: 55–8.
12. Rangaswamy, M., Zacharia, T. T., Krishnamurthy, J., Chennakeshaviah, G., & Vimala, M. G. (2012). Study of computed tomography-guided fine needle aspiration cytology of thoracic lesions. *Journal of cytology/Indian Academy of Cytologists*, 29(1), 30-34.
13. Sarjer, R. N., et al. "Computed Tomography Guided Transthoracic Fine Needle Aspiration Cytology in the Diagnosis of Sonographically Non-Approachable Intrathoracic Masses—A Study of 100 Cases." *Journal of Dhaka Medical College* 20.1 (2011); 25-31.
14. Basnet, S. B., Thapa, G. B., Shahi, R., Shrestha, M., & Panth, R. (2008); Computed tomography guided percutaneous transthoracic fine needle aspiration cytology in chest masses.
15. Baby, J., & George, P. Computed tomography guided fine needle aspiration cytology of thoracic lesions: A retrospective analysis of 114 cases.
16. Kalhan, Shivani, et al. "Evaluation of precision of guidance techniques in image guided fine needle aspiration cytology of thoracic mass lesions." *Journal of cytology/Indian Academy of Cytologists* 29.1 (2012); 6-10.
17. Conces DJ, Clark SA, Tarver RD, Schwenk GR. Transthoracic needle aspiration biopsy value in diagnosis of pulmonary infections. *AJR Am J Roentgenol* 1989; 152: 31-4.
18. Gangopadhyay, Mimi, et al. "Computed tomography guided fine needle aspiration cytology of mass lesions of lung: Our experience." *Indian journal of medical and paediatric oncology: official journal of Indian Society of Medical & Paediatric Oncology* 32.4 (2011); 192-196.
19. Powers CN, Silverman JF, Geisinger KR, Frable WJ. Fine-needle aspiration biopsy of the mediastinum. A multiinstitutional analysis. *Am J ClinPathol*. 1996; 105: 168-73.
20. Pérez Dueñas, Virginia, et al. "Usefulness CT-guided FNAC in the Diagnosis of Mediastinal Lesions." *Archivos de Bronconeumología ((English Edition))* 46.5 (2010); 223-229.
21. Gupta S, Michael JW, Frank AM, Kamran A, Marshall EH. CT guided percutaneous needle biopsy of intrathoracic lesions by using the transternal approach: experience in 37 patients. *Radiology* 2002; 222: 57-62.

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Age	Sex		Total
	Male	Female	
<20	2 (4.9%)	1 (7.1%)	3 (5.5%)
20-29	4 (9.8%)	0 (0.0%)	4 (7.3%)
30-39	0 (0.0%)	3 (21.4%)	3 (5.5%)
40-49	10 (24.4%)	2 (14.3%)	12 (21.8%)
50-59	9 (20.0%)	3 (21.4%)	12 (21.8%)
60-69	11 (26.8%)	5 (35.7%)	16 (29.1%)
70+	5 (12.2%)	0 (0.0%)	5 (9.1%)
Total	41	14	55
Mean	51.22 ($\pm$ 16.405)	48.00 ($\pm$ 15.546)	50.40 ($\pm$ 16.110)

Table1: Distribution of studied cases according to age and sex

SITE	BENIGN	MALIGNANT	IN CONCLUSIVE	TOTAL n %
Lung	5	30	2	37 (67.27)
Mediastinum	2	6	1	9 (16.4)
Hilar region	1	1	0	2 (3.6)
Pleura	1	1	0	2 (3.6)
Thoracic Vertebra	2	1	0	3 (5.5)
Paraspinal Region	1	1	0	2 (3.6)
TOTAL	12 (21.81%)	40 (72.72%)	3 (5.4%)	55 (100.0)

Table 2: Distribution of lesions according to site

CYTOLOGIC DIAGNOSIS	Lung	Mediastinum	Hilar Region	Pleura	Thoracic Vertebra	Paraspinal Region	Total
Acute inflammatory Lesion (Organised Abscess)	3	1	0	0	1	0	5
Chronic non- specific inflammatory lesions	1	1	0	0	1	0	3
Tubercular granulomatous lesion	1	0	1	0	0	0	2
Haematoma	0	0	0	0	0	1	1
Benign Spindle cell tumor.	0	0	0	1	0	0	1
Total	5	2	1	1	2	1	12

Table 3: Distribution of specific types of Benign lesion depending upon the site

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Neoplastic Lesion	Lung	Hilar Region	Mediastinum	Pleura	Paraspinal Region	Thoracic Vertebra	Total
Squamous Cell Carcinoma	13	0	0	0	0	0	13
Adenocarcinoma	9	0	0	0	0	0	9
Bronchoalveolar Carcinoma	3	0	0	0	0	0	3
Large Cell Carcinoma	2	0	0	0	0	0	2
Small Cell Carcinoma	1	0	0	0	0	0	1
Poorly Differentiated Carcinoma	1	0	0	0	0	0	1
Metastasis	1	0	4	0	1	1	7
Lymphoma	0	1	2	0	0	0	3
Malignant Mesothelioma	0	0	0	1	0	0	1
Total	30	1	6	1	1	1	40

Table 4: Distribution of specific types of malignant lesions depending upon the site

STUDY	NO.OF LESIONS	DIAGNOSTIC ACCURACY %	SENSITIVITY %	SPECIFICITY %
Arslan et al 2002 ³	316	88	88	100
J P Sing et al. 2004 ⁵	34	85.33	92.6	100
Basnet et al 2008 ¹⁴	100	82	88	84
Sarjer R.N et al 2011 ¹³	100	96	84	100
Rangaswamy et al, 2012 ¹²	83	96.3	93.33	100
Kalhan Shivani, et al 2012 ¹⁶	120	70.8	93.2	100
Present study	55	94.2	92.5	100

Table 5: Statistical results-comparative analysis

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FIGURE 1 : A CT scan showing malignant lung mass with certain evidence of invasion of all major mediastinal structures and subcarinal lymphadenopathy

A C.T. scan showing mediastinal lobulated mass

*Smear cytology of squamous cell carcinoma at high power A & B H&E 40X.
C Smear cytology of moderately differentiated squamous cell carcinoma
at high power*

*A. CT scan showing paratracheal and hilar soft tissue density mass lesion
.B Smear cytology of tubercular Granulomatous lesion at high power
C. Granuloma.*

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