ORIGINAL ARTICLE

COMPUTED TOMOGRAPHY GUIDED TRANSTHORACIC FINE NEEDLE ASPIRATION CYTOLOGY IN EARLY DIAGNOSIS OF INTHRATHORACIC MASSES IN TERTIARY CARE HOSPITAL OF TRIPURA , NORTHEAST STATE OF INDIA

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ABSTRACT

Background: Intrathoracic mass is a common problem but it is difficult to diagnose as it is difficult to access. Computed tomography (CT)-guided fine needle aspiration cytology (FNAC) is regarded as a rapid, safe, and accurate diagnostic tool in examining thoracic mass lesions.

Aim: The study was performed to evaluate the usefulness of computed tomography (CT)-guided FNAC of intrathoracic masses in our centre**.**

Materials and Methods: This study was carried out at the Department of Radiology and Pathology of Tripura Medical College and Dr BRAM Teaching Hospital,Agartala,Tripura, during the period of January 2012 to January 2015 on 86 patients with chest x-ray and CT findings suggestive of intrathoracic mass, who attended our hospital for treatment.

Results: Out of 86 cases, 67.4% (n = 58) were male and 32.5% (n =28) were female. The age range varied from 45 to 85 years with highest number of patients in the age group 45-55 years. There were 82(95.3%) parenchymal (lung) tumors and out of remaining four cases two was mediastinal & two hilar-paraaortic. The most common tumor was squamous cell carcinoma (55.8%) followed by adenocarcinoma (23.25%) and metastatic carcinoma (3.48%). Post procedural complications were minimal (only pain at puncture sites).

Conclusion: CT-guided FNAC is a low cost, safe, minimally invasive and accurate diagnostic procedure. The categorical diagnosis can also be achieved on the basis of cytomorphology.

Keywords: Bronchogenic carcinoma, computed tomography, fine needle aspiration cytology

INTRODUCTION

Intrathoracic mass is a common problem encountered by the clinicians worldwide[1] ;but it is difficult to diagnose as it is difficult to access..FNAC of deep organs needs the aid of ultrasonography or computed tomography as a guidance to perform it[8]. Deep intrathoracic masses cannot be imaged by ultrasonography. Numerous reports have shown CT-guided transthoracic FNAC to be an accurate and safe method for the diagnosis of intrathoracic masses.CT guidance helps fine needle aspiration of nearly all lesions that are visible on CT scans, regardless of size or position[10]. The vast majority of lung malignancies can be confidently diagnosed with cytomorphological characterization in right clinical context. It can accurately sub-classify the type of bronchogenic carcinoma and suggest a possible primary site of metastatic lung tumours. Vascular & cardiac structures are well demonstrated & can be safely avoided[8]. An extra-pleural approach to me-

diastinal lesions can also be achieved. Moreover, CT guided transthoracic FNAC can be used safely as an out door procedure. So, some investigators recommend CT guided FNAC as the initial method of diagnosis of deep intrathoracic masses. The study was performed to evaluate the usefulness of computed tomography (CT)-guided FNAC of intrathoracic masses in our centre.

MATERIALS AND METHODS

This cross-sectional observational study was carried out at the Department of Radiology and Pathology of Tripura Medical College and Dr BRAM Teaching Hospital,Agartala,Tripura, during the period of January 2012 to January 2015 on 86 patients with chest x-ray and CT findings suggestive of intrathoracic mass, who attended the above-mentioned hospital for treatment. The study was approved by institutional ethical committee.

All of them were conscious, cooperative with stable clinical condition without evidence or clinical suspicion of bullous and emphysematous change, diffuse lung diseases, coagulopathy, vascular lesion, pulmonary arterial hypertension .

Necessary clinical examination and relavant investigations were done for exclusion of the above clinical conditions e.g. blood for TC, DC, ESR, Hb% , platelet count, BT ,CT and prothrombin time and X-ray chest PA and lateral views. Recent plain and contrast CT of chest were made available prior to CT guided FNAC.

FNA was done by the investigators after explaining the risks and benefits of the procedure to the patients and written consent taken from each patient. Then an axial scan of area of interest only was done to locate the lesion (distance from the surface and needle angulations) ;the best approach (supine or prone or lateral) was judged and the skin puncture site was marked with a radio opaque marker (Fig 1). After cleaning and draping ,a 23-gauge spinal needle was inserted during suspended respiration, directing its tip towards the lesion. With the tip of the needle located within, a repeat slice of the area of interest was taken to check the exact position of its tip (Fig 2). 10- ml syringe was attached to the needle and was pulled back maintaining a sustained negative suction . After 4 to 5 to and fro movement of needle inside the mass, suction was relieved and the needle pulled out. The aspirate was smeared on slides and dried and fixed properly . Then these were stained with Romanowsky dyes and examined by a cytopathologist. A post FNAC scan was taken for all patients to rule out post-FNA pneumothorax. For any amount of pneumothorax , patient should kept under observation for 24 hours and a chest Xray PA view was done after 24 hr to rule out any subsequent development of pneumothorax. In case of no complication, patient can be discharged

RESULTS

Among 86 patients with intrathoracic mass, the age ranged between 45-85 years with highest number of patients was in the age group of 45-55 years(39.5%) followed by 56-65 years(36%). Age distribution is shown in table 1.

Table l: Age distribution (n=86)

Age	No. (%)
45-55	34 (39.50)
56-65	31 (36.00)
66-75	9 (10.40)
76-85	12 (13.95)

Table 2: Sites of the lesions (N=86)

Site	No. (%)
Pulmonary	82 (95.3)
Hilar and paraaortic	2 (2.3)
Mediastinal	2 (2.3)

Table 3: CT guided FNAC diagnosis of intrathoracic masses (n=86)

Findings	No. (%)
Squamous cell carcinoma	48 (55.8)
Adenocarcinoma	20 (23.25)
Small cell carcinoma	1 (1.16)
Metastatatic carcinoma	3 (3.48)
Extramedullary haematopoiesis	1 (1.16)
Lymphoma	1 (1.16)
Encysted effusion	6 (6.8)
Plasmacytoma	1 (1.16)
Abscess	3 (3.4)
Non diagnosed (inadequate tissue)	2 (2.32)

There were 58 men (67.4%) and 28 women (32.5%). Lung was the most common site of the masses having 82 cases (95.3%). Out of remaining four cases two was mediastinal (2.3%) & two hilar-paraaortic

(2.3%). Sites of the lesions are summarized in Table 2**.**

Of the 86 patients underwent CT-guided FNA, definitive diagnosis for 2 patients could not be made due to insufficient tissue material. The diagnosis of rest of 84 patients is given in the Table 3.

Table 4 Complications of CT guided FNAC (n=86)

Complication	No. (%)
Pain at Puncture site	31 (36.0)
Small Pneumothorax	0
Haemoptysis	0
No complication	55 (64.0)

Squamous cell carcinoma was most prevalent among the spectrum of cytological diagnoses followed by adenocarcinoma. Some rare cases were also found. Post procedural complications were minimal. Only pain at puncture sites in 31 cases (36%). FNAC finding of different cases is given in Fig 1- Fig 4.

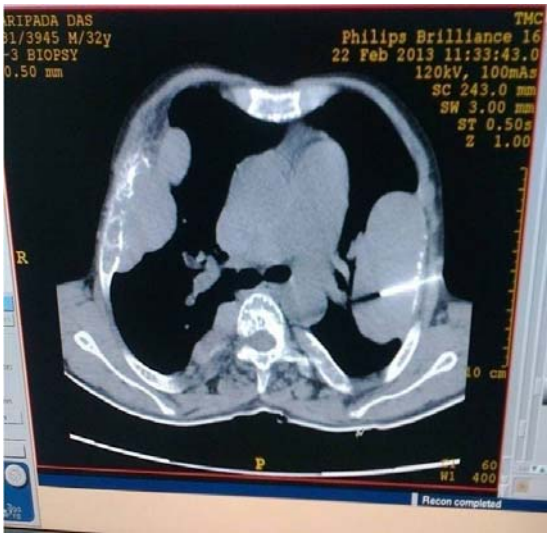

Figure 1: Bilateral lung mass, Needle tip inside the mass

CT guided FNAC proved to be a safe procedure. Out of 86 cases in our study no major complications arose. 31 cases that is 36% complained pain at puncture site. In 55cases that is 64% showed no complication at all.

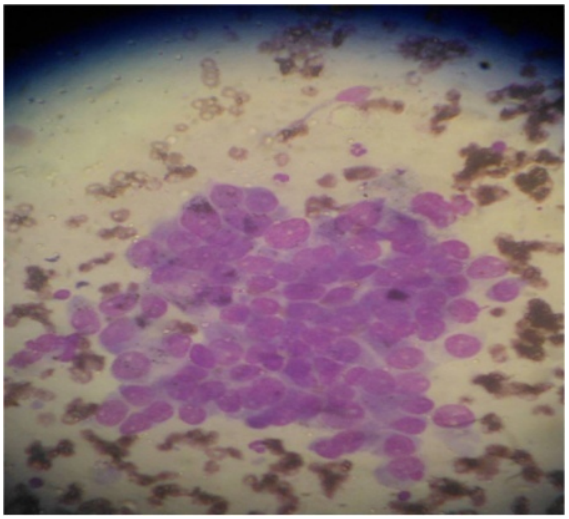

Figure 2 :Adenocarcinoma

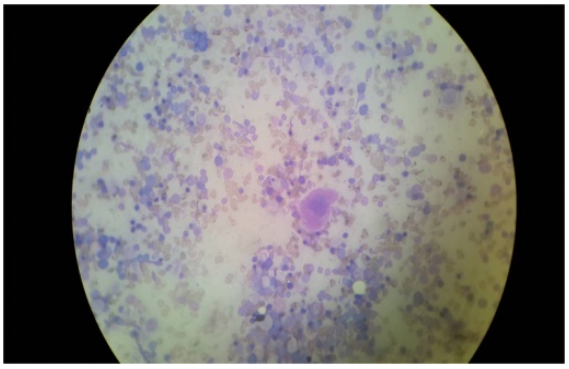

Figure 3 :Extramedulary haematopoiesis

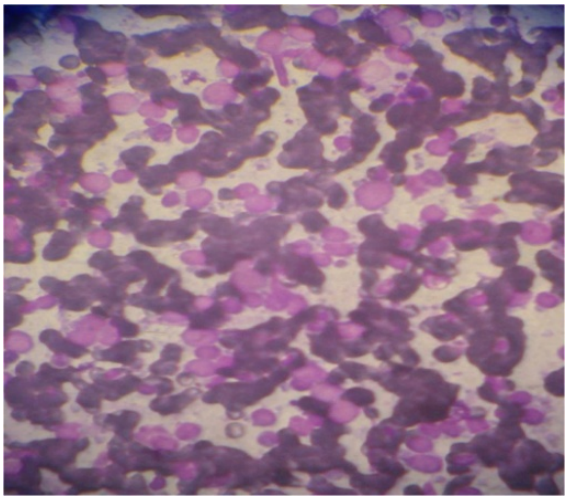

Figure 4: Lymphoma

DISCUSSION

CT guided transthoracic FNAC is a safe and accurate means of diagnosing benign and malignant intrathoracic lesions. In this study, Out of 86 patients 39.5% were in the age group from 45-55 years and 36% were in the age group of 56-65 years which is similar with the study of Sarker RN et.al[1] who found patients of intra-thoracic mass 36% in the age group ranging from 46-55 years and 21% in the age group of 56-65 years, these two groups were predominant in terms of age.

There were 58 men (67.4%) and 28 women (32.5%).In the study of Sarker RN et.al.[1] out of 100 cases there were 77 men (77%) and 23 (23%) were women .This correlates with the well-known fact that intrathoracic mass occurs most commonly in older age group and in males than in females. Female cases are less because malignant pulmonary lesions are rare in females in our population. Male: Female ratio was 2.07:1 in our study.

The locations of the lesions were as follows: pulmonary 82 (95.3%), hilar and paraaortic 2(2.3%), mediastinal 2(2.3%). In the study of Sarker RN et.al.[1] : pulmonary 67 (67%), hilar 14(14%), mediastinal 19(19%). In the final diagnosis, squamous cell carcinoma was the commonest malignant tumour followed by adenocarcinoma and metastatatic carcinoma . These findings are similar to the findings of the study done by Mostafa[4] although his study was not guided by CT and the number of cases was less.

Our experience is similar to the study of Singh et al[5] where fatal complications like tension pnemothorax, air embolism, endobronchial haemmorhage etc were absent. The complication rate depends on the distance of the lesion from pleura and lesion size. The more the amount of the lung tissue traversed by the needle the more was the complication rate and smaller the lesion the more was the complication rate. In this study fine needle of 23G was used where the chance of complication seems to be minimum which correlates well with the study of Zavala et al[6].

CONCLUSION

This study concludes that CT guided transthoracic needle aspiration cytology using 23 gauge spinal needle is a highly effective procedure in the diagnosis of thoracic masses It is a relatively simple procedure with good patient compliance and low morbidity.The use of CT-guided FNAC of intrathoracic lesions reduces the diagnostic interval and cost. It also avoids unnecessary thoracotomy for diagnostic purposes. As the facilities continue to improve, it is likely to have a greater role in the initial evaluation of intrathoracic mass in the near future.

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