

A Comparison between U/S and CT Guided Needle Biopsies of Intra Thoracic Masses

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ABSTRACT

Purpose: To determine the role, accuracy and selection criteria of u/s and CT guided needle biopsy of intrathoracic masses.

Material and methods: Imaging guided intrathoracic biopsies (n=100) were performed in patients of Ghulab Devi Chest Hospital, Lahore. U/S guidance was used for lesions abutting the chest wall. CT guidance was used for all masses surrounded by aerated lung. Location of masses, sizes, guidance modality, histologic results and complication was recorded.

Results: 20 lesions, (n=8) pleural, (n=4) chest wall, (n=1) mediastinal and (n= 7) parenchymal were amenable to u/s guided biopsies. The mean mass diameter ranges b/w 5 cm to 3.5 cm. No of passes 3=average and histological diagnosis was achieved in 15 Cases. Only 2 cases reported for pneumothorax. CT guidance was used in 80 patients. Lesions were (n=45) parenchymal, (n=34) mediastinal and (n=1) pleural. The mass diameter ranges from 2.0 to 3.5cm and number of passes 1-2. Histological diagnosis were achieved in 78 cases included 28 with small masses. Complications included pneumothorax seen in 4 pts and parenchymal hge (n=4).

Conclusion: CT guided biopsies are quite safe for mediastinal masses as compared to u/s. U/S is effective and safe in masses abutting the chest wall, debilitated and less co-operative patients.

Keywords: Tissue core, lung neoplasm, CT scan

INTRODUCTION

During the past 20 years new techniques have emerged in the thoracic imaging such as high resolution CT scan and MRI. Real time u/s is used in pulmonary and critical care medicine in lesions abutting the chest wall. Introduction of CT scanning in 1980 has allowed clinician to increase the range of biopsies. Small masses are easily approachable by CT scan by decreasing the slice thickness and exact marking the site by metallic marker.

U/S may be superior to CT scanning for comparable region of the chest, with the exception of intra-pulmonary lesions, that are only visible on CT scanning. The disadvantages of U/S bear mentioning. A peripheral lesion is undetectable by U/S with thin layer of aerated lung parenchyma.

MATERIAL AND METHOD

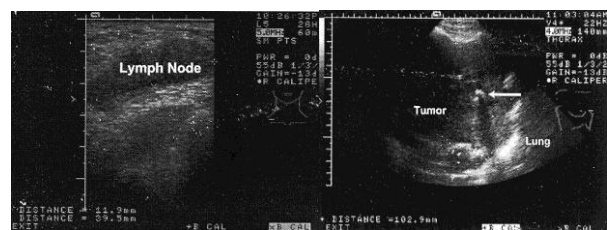
Visualization of the chest wall by high frequency linear probe of 5 MHZ while for the pleural and pulmonary pathology convex probe was used to access the deeper structures b/w the ribs. Probe may be moved in longitudinal and transverse direction to visualize the lung surface through the intercostal space thereby avoiding ribs. To examine the anterior and posterior part of the chest patient was kept in sitting position with arms elevated and hands clasped behind the neck.

Pleural movement is observed during inspiration and expiration. Solid lesion close to the diaphragm require special maneuver. Spiral CT scanner is used to image the entire thorax in multiple thickness slices. In both imaging modalities procedure of core needle biopsies are almost the same with the exception that in real time U/S tip of the needle can be monitored throughout the procedure and fine adjustment can be made quickly and precisely while in CT scanning site of the biopsy is marked with metallic marker. In both site of the biopsy is prepared and local anaesthesia is given prior to biopsy, trucut or surcut biopsy needles were used.

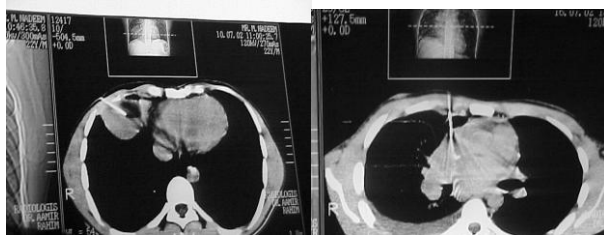
RESULTS

Patients selected were with pleural, chest wall, mediastinal and parenchymal lesions for U/S.

Out of 100 patients 20 were amenable to U/S guided biopsy. Among them (n= 8)



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Pleural-mesotheliomas, empyema, and para -pneumonic effusion. (n=7) Parenchymal lesions-fungal, tuberculous, benign and malignant tumours of greater than 3.5 cm. (n=4) Chest wall-heamatoma, malignancy, inflammatory,(n=1) mediastinal.

CT guided biopsy was done in 80 patients due to (n=45) Parenchymal lesions inclusive small masses of malignant, benign tumours, metastatic nodules, inflammatory masses.(n=34) mediastinal-enlarged lymph nodes, malignant tumours, fibrolipomatosis. (n=1) Pleural. The mean diameter of the size of the lesion biopsied was 2.0 cm.

Table 1:

Chest Wall	
Rib fracture and osteomyelitis	Chimney phenomena
Tumours	Chest wall infiltration with heamatoma Vs malignancy
Lymph nodes	Supraclavicular screening with normal chest radiograph & CT
Lungs	
*Atelactasis	Pneumonia
*Abscess	Empyema strands not visualized
*Peripheral lesions	Tumour Vs benign lesion
*Peripheral cavity	Bedside transthoracic biopsy fungal tuberculous
Pleura	
* Effusion	Bedside thoracentesis
*Empyema	Empyema Vs parapneumonic effusion
*Solid lesions	Suspicion of Mesothelioma, diaphragmatic tumour
*Dynamic examination	During pregnancy
Mediastinum	
*Enlargement	Fluid vs solid lesions`
*LNs	Needle aspiration
*Pericardial effusion	Rapid and bedside life saving intervention
* SVC syndrome	Evaluation of distended neck veins

DISCUSSION

U/S guided intrathoracic biopsies has several advantages on CT including bedside approach, low cost , no radiation exposure and non requirement of

I/V contrast .In this study diagnostic accuracy was evaluated retrospectively CT scan is superior to U/S for aortopulmonary window, sub-carinal and paravertebral regions and posterior mediastinum. CT scanning is always necessary for initial staging and planning of therapy. Patients with emphysema have reduced suprasternal, parasternal and aorto-pulmonary windows that limit U/S evaluation. CT scanning performed during inspiration and expiration is effective in outlining tumour invasion in the area of mid lower lobes. This maneuver is less helpful in upper lobe due to diminished respiratory movement. Real time U/S may observe gliding of the visceral pleura. Adhesions or infiltration can not always be determined with U/S, spiral CT scan is the most accurate imaging method to detect small nodules of entire lung. U/s is not useful in detecting mets of lung parenchyma because of limited views.U/s doesn't diagnose diffuse interstitial lung disease. High resolution CT scan is the method of choice in identifying disease to a better degree..

COMPLICATIONS

Pneumothorax and hemorrhage visualized in both imaging modalities.

CONCLUSION

CT scan is still the best imaging modality for evaluating and staging the mediastinal masses as compared to U/S despite of high radiation exposure , cost and contrast reactions.

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