

Diagnosis of Pleural & Lung Diseases using Sonography

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Research Article

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ABSTRACT :

Sonography has been proved to be valuable for the evaluation of a wide variety of chest diseases, particularly when the pleural cavity is involved. The advantages of Sonography are that it is a relatively inexpensive, widely available, mobile form of multi-planar imaging free from ionizing.

The 30 patients who had visited the Out-Patient Department (OPD) and in-patient department (IPD) of a hospital in North India were considered in the study. All patients were undergone radiologically then as per the requirements the skiagram were taken.

Various biochemical and histopathological tests were done wherever required. After this, the patients were examined by ultrasound and areas to be examined were selected on the basis of information available from skiagrams.

The data from the Radiography and the sonography showed that the Radiological results are better than detected in the Sonography.

Keywords: Pleural & Lung Diseases, Sonography, Radiograph etc.

INTRODUCTION:

Sonography has been proved to be valuable for the evaluation of a wide variety of chest diseases, particularly when the pleural cavity is involved. The advantages of Sonography are that it is a relatively inexpensive, widely available, mobile form of multi-planar imaging free from ionizing.

Sonography can be used to explore the surfaces of the lungs through the intercostal spaces, but the presence of the ribs and of air in the expanded lung reduces the value of this imaging modality in the examination of deeper thoracic structures. Nevertheless, US is considered a reliable, inexpensive, safe, and reproducible diagnostic method for the work-up of patients with diseases of the diaphragm (neoplasms, paresis), thoracic wall (abscesses, fistulas, neoplasms), lung (atelectasis, pulmonary consolidation), anterosuperior mediastinum (neoplasms, lymphoma, cysts), the region between the thorax and the abdomen, and above all, the pleurae (extrapleural masses, pleural effusions).

Invasive procedures such as aspiration, needle biopsy of the pleura, and closed tube placement for effusion drainage can be performed with more accuracy and safety under US guidance. US is notably helpful for critically ill patients because of its portability and simplicity.

Sonography has a very high accuracy in the diagnosis of

pleural and peripheral lung diseases. It has a much higher sensitivity than conventional radiology in the diagnosis of pleural effusion and its effect on underlying lung. It can easily differentiate solid from cystic lesion. It has a high efficacy in differentiating tapable and non-tapable pleural effusions. It is ideal for site selection on skin to target measurements, wherever needle puncture is to be undertaken. Sonography is the best modality for very ill patients and it causes minimum discomfort and can be used at bed side.

Major advantages of US include the absence of radiation, low cost, flexibility and beside availability, and short examination time compared with computed tomography.

pleura is a large, thin sheet of tissue that wraps around the outside of your lungs and lines the inside of your chest cavity. Between the layers of the pleura is a very thin space. Normally it's filled with a small amount of fluid. The fluid helps the two layers of the pleura glide smoothly past each other as your lungs breathe air in and out.

Disorders of the pleura include

- Pleurisy - inflammation of the pleura that causes sharp pain with breathing
- Pleural effusion - excess fluid in the pleural space
- Pneumothorax - buildup of air or gas in

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the pleural space

- Hemothorax - buildup of blood in the pleural space

Many different conditions can cause pleural problems. Viral infection is the most common cause of pleurisy. The most common cause of pleural effusion is congestive heart failure. Lung diseases, like COPD, tuberculosis, and acute lung injury, cause pneumothorax. Injury to the chest is the most common cause of hemothorax. Treatment focuses on removing fluid, air, or blood from the pleural space, relieving symptoms, and treating the underlying condition.

MATERIALS AND METHODS [2]:-

The 30 patients who had visited the Out-Patient Department (OPD) and in-patient department (IPD) of a hospital in North India were considered in the study. The patients considered in this study are of all ages. The study group patients.

All patients were undergone radiologically then as per the requirements the skiagram were taken.

Various biochemical and histopathological tests were done wherever required. After this, the patients were examined by ultrasound and areas to be examined were selected on the basis of information available from skiagrams.

The liver and spleen were used as a tissue texture reference for solid and fluid containing regions respectively.

The legion was evaluated. The skin to target depth was measured.

Sonographic findings its probable diagnosis is recorded. Also the site of the puncture is also marked. Images were recorded using camera.

RESULTS AND DISCUSSION:-

Out of the 30 patients studied the age of the patients are ranging from the 5-50 years. Many of the patients are having the problem for fewer months. There are also other conditional symptoms observed in the study group patients.

Table 1 : Observation in Radiology & Sonography of patients having pleural infusion

| Observation | Radiology | Sonography |
|-----------------|-----------|------------|
| Fluid Suspected | 11 | 17 |
| False Positive | 6 | 4 |
| Not Determined | - | 3 |

Table 1 shows the comparison of the Radiology & Sonography study of the study group patients. The Sonography showed the better observation as compared to the Radiology.

Table 2 : Pathological Comparison in the Radiology & Sonography

| Pathological Findings | Radiology | Sonography |
|-----------------------------|-----------|------------|
| Parenchymal tumour | 8 | 12 |
| Hydatid cyst | 4 | 3 |
| Sub diaphragmatic pathology | 3 | 2 |
| Consolidation | 1 | 2 |
| Pleural fibrosis | 1 | 2 |
| Lung abscess | 1 | 2 |
| Pleural Tumour | 1 | 1 |
| Pericardial effusion | 1 | 1 |
| Total | 20 | 25 |

Table 2 shows the comparison of the pathologies other

than the pleural infusion. The data from the above table showed that the Radiological results are better than detected in the Sonography.

The Sonographic examination showed the correct diagnosis of the 25 patients whereas the conventional Radiology showed the correct diagnosis of the 20 patients.

For routine monitoring radiography is used as investigation method for the pleural & peripheral lung based lesions. Many time when the hemithorax is opaque or the fluid is spreaded then the normal radiology is not confirmative diagnostic tool. Hence in this scenario Sonography is major confirmatory tool for the evaluation of the pleural or lung diseases.

Gryminski et al [3] in a study of 116 patients compared ultrasonography with radiology and obtained 93% of effusion by radiology. In another study of 41 patients, pleural effusion was diagnosed in 93% by ultrasonography. Doust et al [4] also observed an accurate sonodiagnosis in 25 out of 27 cases of pleural effusion. Similar results are reported by others [5,6].

CONCLUSION:-

Ultrasonic examination is simple and can be performed at bed side. The results of examination are known immediately to the examiner and they are easy to interpret. Like radiology, the ultrasonic examination is a non invasive technique, more comfortable for a sick patient [7]. It is generally accepted that the ultrasonic intensity used for diagnostic purpose is entirely harmless to the patient.

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