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CT Imaging's Function in Assessing a Single Lung Nodule with Extrapulmonary Neoplasms

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Abstract

Background: A discrete, well-marginated, rounded opacity less than or equal to 3 cm in diameter that is entirely encircled by lung parenchyma, does not touch the hilum or mediastinum, and is not connected to pleural effusion, atelectasis, or adenopathy is referred to as a solitary pulmonary nodule. Aim and objectives: The purpose of this study is to ascertain the incidence of benign lesions, primary lung cancer, and single lung metastasis in patients with a solitary lung nodule and a primary extrapulmonary neoplasm. Additionally, a statistical model will be developed to assist clinicians in selecting patients for diagnostic biopsy based on the features of chest radiographs and CT scans. Materials and methods: A 6-month retrospective review of CT and Chest Radiographs of 35 patients with a single pulmonary nodule and an extrapulmonary malignant tumor was conducted at our Dhiraj General Hospital. Results: A total of fifty individuals with extrapulmonary neoplasms were assessed; among them, primary bronchiogenic carcinoma, lung metastases, and benign nodules were identified and assessed. Conclusion: On CT, single lung nodules in patients with extrapulmonary cancers displayed a range of patterns. The majority of the non-calcified solitary pulmonary nodules found in this series were cancerous. The histological features of the extrapulmonary tumor and the patient's smoking history determine the chance of a spread. Metastatic illness was less prevalent than lung cancer.

Key words: CT Imaging, Extrapulmonary Neoplasm, Solitary Pulmonary Nodule.

Introduction

High A discrete, well-marginated, rounded opacity less than or equal to 3 cm in diameter that is entirely encircled by lung parenchyma, does not touch the hilum or mediastinum, and is not connected to pleural effusion, atelectasis, or adenopathy is referred to as a solitary pulmonary nodule. Until proven differently, lesions bigger than 3 cm are classified as masses and treated as malignancies. A single pulmonary nodule is frequently seen in patients with extrapulmonary neoplasms, either present or past. Chest radiography or computed tomography may be used to find such a nodule during the work-up or follow-up of a known extrapulmonary cancer.

To determine the best course of treatment, such as observation, biopsy, resection, chemotherapy, radiation therapy, or a combination of these, it is typically necessary to identify the genesis of the nodule. Obtaining tissue and making a conclusive diagnosis might occasionally be challenging or impractical. Knowing the possibility that a nodule is a benign lesion, a metastasis, or a primary bronchogenic carcinoma may be useful in some situations.

Aim and objectives

To find out how frequently patients with a single lung nodule and a primary extrapulmonary neoplasm experience benign lesions, primary lung cancer, and single lung metastases. To evaluate the Chest Radiographs and CT characteristics of solitary lung nodule with a primary extrapulmonary to create a statistical model that will direct medical professionals in selecting patients for diagnostic biopsies.

Materials and Methods

A review of 35 patients' CT and chest radiographs taken over a 6-month period at our Dhiraj General Hospital who had a single pulmonary nodule and an extrapulmonary malignant tumour. To check for the presence of a single lung nodule, images were examined. The following nodular traits were noted, if they were present:

The factors that need to be considered include Sidedness, Distribution, CT attenuation, Shape, Size, Margin, and Calculation. The patient's age and smoking history, as well as the histological features of the nodule, were shown to be associated with those of the extrapulmonary tumour.

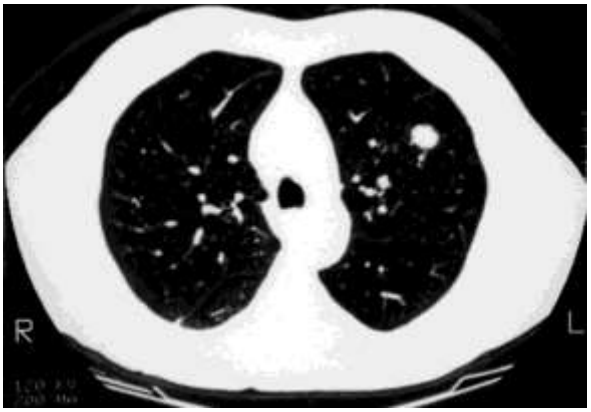
Results and Discussion

Benign pulmonary nodule

Right upper lobe nodule shows peripheral calcification and high Hounsfield unit enhancement, suggesting that the lesion is a calcified, benign pulmonary nodule (**Figure – 1**).

Figure – 1: Benign pulmonary nodule.

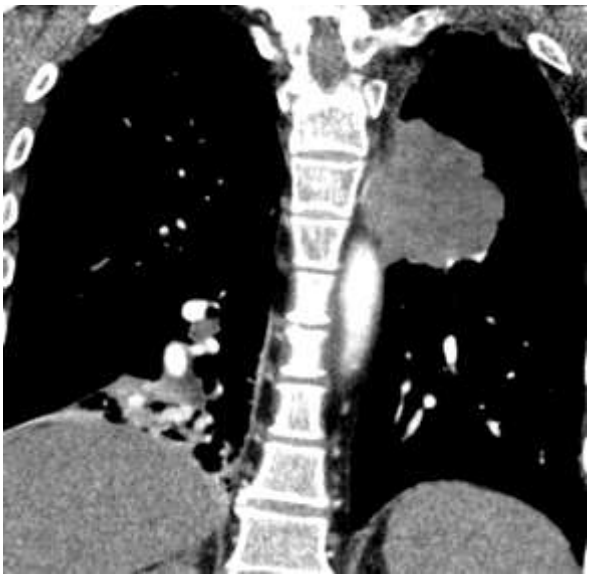
Figure – 2: Metastatic deposit.



Metastatic deposit

A 1.5 cm coin lesion in the left upper lobe in a patient with prior colonic carcinoma. Transthoracic needle biopsy findings confirmed this to be a metastatic deposit (**Figure – 2**).

Figure – 3 to 5: Primary bronchogenic carcinoma with brain metastases.



Primary bronchogenic carcinoma with brain metastases (Figure – 3 to 5)

Chief complaints of the patient - Severe shortness of breath, Headache, Altered mental status. History of smoking was present. CT of the brain performed revealed an enhancing intra-axial lesion. Pathologically proven as- Bronchogenic Carcinoma.

Lung metastases (Figure – 6 to 8)

There are numerous soft tissue and calcified nodules in both lung fields, which may indicate lung metastases. • The largest tracheo-bronchial node was observed among several enlarged necrotic mediastinal nodes. The lung's left parahilar lingual lobe has calcified scarring around a 42 x 28 mm soft tissue lesion that is heterogeneously increasing. Both liver lobes show several hypodense, poorly enhancing lesions that are on average 1-3 cm in size and suggest the presence of liver metastases.

Figure – 6 to 8: Lung metastases.

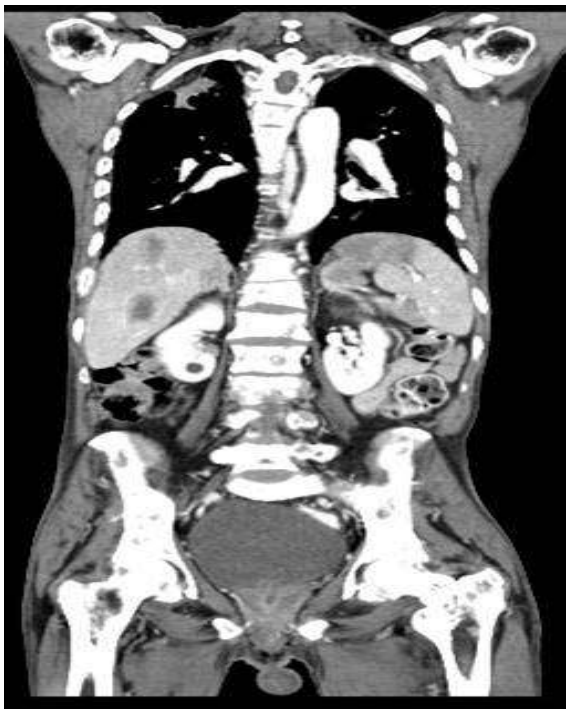
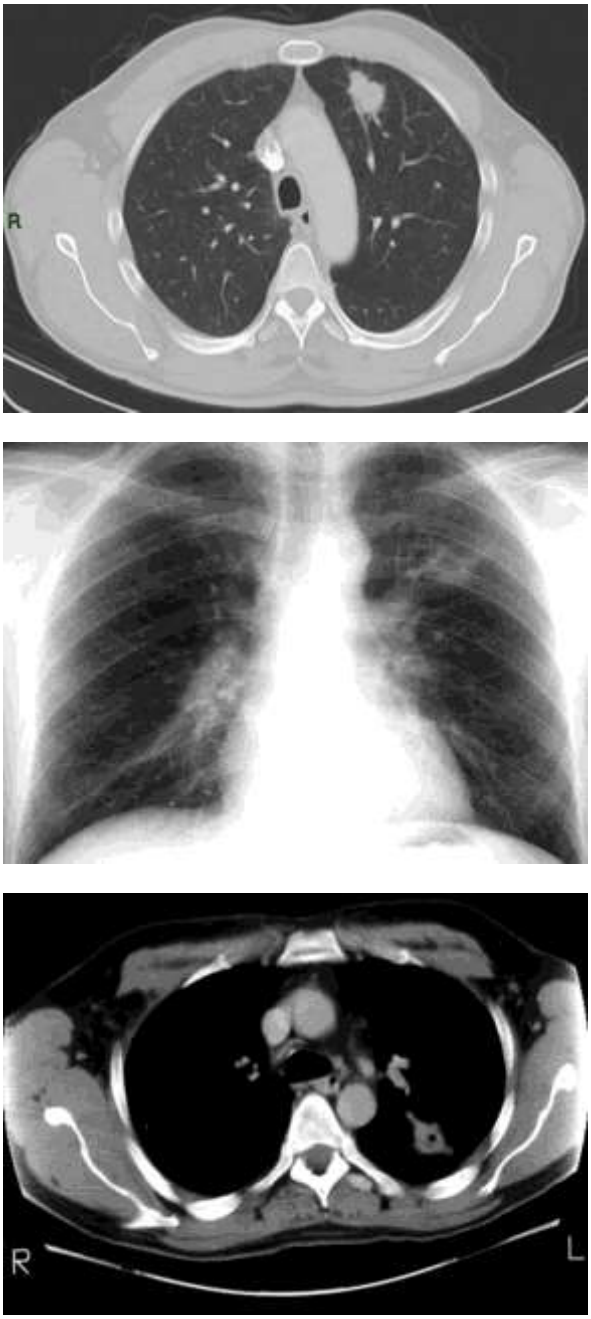


Figure – 9 to 14: Lung cancer left upper lobe.



Lung cancer left upper lobe (Figure – 9 to 14)

Based on needle biopsy results, a lesion in the left upper lobe with central lucency and weakly defined borders was identified as actinomycosis. The patient's computed tomography (CT) scan from the earlier picture. The diagnosis of actinomycosis was confirmed by the presence of typical sulfur granules upon needle biopsy.

Lung metastases with renal cell carcinoma (Figure – 15, 16)

Left Renal mass arising from mid pole with perinephric involvement suggestive of malignant mass - Renal Cell Carcinoma. Sub-centimeter lung nodule in right basal lung suggestive of lung metastases.

Figure – 15, 16: Lung metastases with renal cell carcinoma.

Conclusion

Patients with extrapulmonary malignancies had solitary lung nodules that displayed a range of CT patterns. Of the non-calcified single pulmonary nodules found in this series, over half were cancerous. The patient's smoking history and the extrapulmonary neoplasm's histological features determine the chance of a spread. Lung cancer was more common than metastatic disease.

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