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A Study of CT evaluation of lung nodule backed by histopathology to find the efficacy of CT

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Abstract

The present life style which has contributed to ever increasing smokers population and thanks to the pollution in majority of the cities across the country the lung carcinomas are quiet commonly encountered in radiological practice. The stigma through which the person and the family have to undergo before confirming the diagnosis is enormous. So the radiographic methods of diagnosing the malignancies have to improve. Before confirming the diagnosis, the radiologists, the treating physicians should be somewhat confident about the diagnosis so as to prepare the patients and their relatives for the most probable diagnosis before the confirmatory report. The confirmatory procedures include the PET scan and the Histopathology. Both are time consuming procedures and in an economy like ours, finding a PET scanning centre is rather difficult. So this study puts in an effort to find the efficacy of CT in diagnosing a lung carcinoma.

Keywords: CT, lung nodule, efficacy, cross sectional study.

Introduction

Solitary pulmonary nodules are commonly isolated, spherical radiographic opacities that measure less than 3 cm in diameter and are surrounded by lung parenchyma ^[1]. The lesions can be solitary or multiple. The term coin lesion is not used anymore because it implies a flat structure ^[2]. Any lung nodule has to be thought of as a three dimensional entity. Pulmonary nodules may be found incidentally on imaging studies of other parts of the body ^[3]. In CT screening study, 13 percent of the smokers had pulmonary nodules larger than 5 mm at baseline ^[4]. 14.8 percent of all scans, although this included nodules smaller than 5 mm as well were reported in a study conducted by Furtado CD *et al.* ^[5] 8 to 51 percent incidence has been reported in different studies ^[6, 7]. Lung cancer screening is not shown to prevent mortality ^[8]. The rationale for closely monitoring an incidentally found lesion is to monitor and prevent any undue effects of the disease ^[9].

CT has a higher specificity and sensitivity than chest radiography. It also allows for the assessment of surrounding structures. All patient who undergoes chest radiography and some lesions when identified should be evaluated with a CT. CT is the imaging modality of choice to re-evaluate pulmonary nodules seen on chest radiographs and to follow nodules on subsequent studies for change in size. Chest CT resolution improves as slice thickness decreases; thus, thin cut sliced CT is preferred for evaluation of solitary pulmonary nodules. The present life style also has contributed to ever increasing smoker's population and thanks to the pollution in majority of the cities across the country the lung carcinomas are quiet commonly encountered in radiological practice. The stigma through which the person and the family have to undergo before confirming the diagnosis is enormous. So the radiographic methods of diagnosing the malignancies have to improve. Before confirming the diagnosis, the radiologists, the treating physicians should be somewhat confident about the diagnosis so as to prepare the patients and their relatives for the most probable diagnosis before the confirmatory report. The confirmatory procedures include the PET scan and the Histopathology. Both are time consuming procedures and in an economy like ours, finding a PET scanning centre is rather difficult. So this study puts in an effort to find the efficacy of CT in diagnosing a lung carcinoma.

Aims and Objectives

To study the CT evaluation of lung nodule backed by histopathology to find the efficacy of CT.

Materials and Methods

This study was done in the Department of Radiology, Kanachur Institute of Medical Sciences, Mangalore. The study was done from Feb 2019 to July 2019.

Thirty patients were included in the study.

The study was a cross sectional study.

The sample size of the study consisted of thirty patients. CT scan was done in thirty patients who were identified to have lung nodules either by other mode of radiological studies or first time identified in a CT scan itself.

Inclusion criteria

All the patients were confirmed by CT scans to have lung nodules.

Exclusion Criteria

Other lung pathologies were excluded which were identified by histopathology.

Results

Table 1: Solid vs the cystic

Solid	Cystic	Non confirmatory results on histo-pathology
18	11	1

Table 2: Malignant vs non-malignant (in solid)

Malignant	14
Non Malignant	04

Table 3: Cystic

Cystic	All 11 were Adenomas
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Table 4: Size of the nodule and their diagnosis on histopathology

01-0.4 cm	0.4-0.8 cm	> 0.8 cm
1 (Tuberculosis) so was not included in the study		
Benign	11 - adenomas	
Malignant	2 (Squamous cell)	12 (4-small cell, 2 – giant cell and 6 – squamous)

Table 5: Margin and contour in solid nodules

Margin and contour	Benign	Malignant
Regular and smooth	11- adenomas	
Spiculated		14 (6-small cell, 2 – giant cell and 6 – squamous)
Lobular	6 were lobular	All were lobular

Table 6: Other signs

	Benign	Malignant
Halo sign positive	Nil	2 giant cell.
Calcification	Nil	4 had calcification

Thus out of 30 cases 29 were confirmed by CT followed by histology and only one case was found to be of infectious origin.

So CT is an excellent option having high sensitivity and specificity in diagnosing a lung nodule. When followed by the routine histo-pathology the efficacy is 100 percent.

Discussion

In India, smoking habit is seen majority in the young population. The frequency of smokers are increasing. And

with the present levels of pollution and new lung infections like covid-19, we never will know the exact outcomes of where we are headed. In terms of imaging evaluation, obtaining prior radiographs or chest CT images is useful to determine nodule growth. Further imaging evaluation, including CT enhancement studies and PET/CT, helps determine the malignant potential of solid pulmonary nodules. For solid nodules, CT enhancement of less than 15 HU and low or no glucose which has been tagged with radioactive isotope uptake at PET/CT suggest benignity. Awareness of potential pitfalls in nodule enhancement and PET/CT evaluation of pulmonary nodules that result from infectious or inflammatory conditions is important to avoid misinterpreting imaging findings. The unnecessary tension has to be avoided in the patients and their family by bringing down the possibilities of the false negativity. For subsolid nodules, CT enhancement studies are not applicable, and PET imaging is of limited use because of their low metabolic activity.

Conclusion

The presentation of pulmonary nodules has been identified and discussed successfully. The different features once the lesions have been confirmed by PET and histopathological reports gives an extra edge of suspecting the cases early and also helps to diagnose the life-threatening diseases.

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