

Spectrum of Radiological Findings in Bronchogenic Carcinoma – A Retrospective Study

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Abstract: Plain radiography is the important initial radiological method in diagnosing bronchogenic carcinomas. Though solitary pulmonary opacity is the most common radiographic abnormality, many other significant findings are described in detecting lung cancers. In the present study we evaluated retrospectively the main radiological abnormality at initial presentation in 64 biopsy proven cases of bronchogenic carcinomas that are treated in our hospital

KEY WORDS; Bronchogenic carcinoma-plain radiographs-solitary pulmonary opacity

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I. Introduction

Lung is the most common site of malignancy in men and is the most common cause of death from cancers in both men and women. Early diagnosis of lung cancer will result in more curative treatment, however most of the patients generally present at an advanced stage of the disease. Majority of these patients have symptoms of haemoptysis, cough, chest pain and persistent consolidation. In a small percentage of patients lung malignancies are detected incidentally on routine chest radiographs. Chest radiograph is the most important initial investigation in cases of suspected lung cancers. Multi detector CT scan has become the corner stone in detecting and staging the lung cancers¹. Recently positron emission tomography (PET) imaging has been added in the management of these lesions. Besides the above three investigations, MRI is also implicated in the recent edition staging of lung cancer as per the recommendations by the International Association for Study of Lung cancer². Bronchogenic carcinomas are classified into non small cell lung carcinomas (include adenocarcinoma, squamous cell carcinoma, large cell carcinoma) which constitute about 80 % of all lung cancers, the remaining are small cell lung carcinomas. The chest radiograph findings are many. They include homogenous or patchy opacity involving a segment or lobe of a lung due to incomplete or total atelectasis following bronchial stenosis. There can be associated loss of lung volume as seen in radiographs. In a few cases the radiographs may show regional hyperlucency due to partial atelectasis caused by endobronchial mass. The most important sign of lung malignancy on radiographs is the presence of a solitary pulmonary nodule with a 3cm diameter or more, thick walled cavity, presence of eccentric calcification, ill defined or speculated margin. A solitary pulmonary nodule with a doubling time of 30-365 days is considered as malignant³. The other significant findings suggestive of lung malignancy include hilar mass, non resolving patchy or homogenous consolidation, presence of mediastinal lymphadenopathy and involvement of adjacent structures including vertebra, ribs, chest wall, and plural effusion.

II. Present Study

We retrospectively reviewed the initial radiological findings in 64 histologically proven cases of lung malignancies treated in our institute. The various radiological features recorded are given in the table. The most common finding was solitary homogenous mass and followed by hilar and perihilar mass, atelectasis and nonresolving consolidation

Table : various radiological findings in the present study (total no of cases : 64)

1. Solitary pulmonary mass : 22
2. Hilar and perihilar mass : 8
3. Non resolving consolidation : 6
4. Partial atelectasis with consolidation: 5
5. Plural effusion : 5
6. Lobar consolidation: 3
7. Complete lobar atelectasis : 3
8. Mediastinal adenopathy :3

9. Hilar adenopathy : 1
10. Peripheral lung mass :1
11. Cavitory mass : 1
12. Lung abscess : 1
13. Miliary mottling with mass: 1
14. Mass detected on MD CT only : 4

The solitary pulmonary masses detected in the present study were of varying sizes and Involved different lobes in the lungs. And a few showed focal calcification .In six patients malignancy was suspected as the underlying consolidation was not resolved with antibiotic treatment. Complete and partial segmental and lobar atelectasis was noted in some cases. Plural effusion was the only radiographic findings in five patients which was evaluated further for the evidence of malignancy. Four patients presented with hilar and mediastinal lymphadenopathy on plain radiography . With clinical suspicion of lung malignancy, four patients were further investigated by CT scan even the chest radiographs were normal.

III. Discussion:

The most common radiographic finding of lung cancer is solitary pulmonary nodule⁴. A solitary pulmonary nodule is defined as a round opacity moderately well marginated and not larger than 3 cms in maximum diameter without any associated atelectasis or adenopathy⁵. The lesion can be solid or semisolid. Any lesion more than 3cms is called as solitary pulmonary mass which is almost always malignant⁶. 20-30% of lung malignancies present as solitary pulmonary nodule⁷. The diagnosis and staging of bronchogenic carcinoma depends largely on specific findings observed on chest radiographs⁸. Though solitary pulmonary nodule or mass is the most common radiographic abnormality noted , there are other findings highly suggestive of lung cancers include 1) hilar mass as in the case of central bronchogenic carcinomas 2) Bronchial stenosis due to the presence of endo bronchial tumor which results in either partial or complete atelectasis of a segment or lobe of lung. 3) non resolving pneumonia : a segment or lobe of lung show non homogenous consolidation which is more commonly seen in adenocarcinoma in situ .4) presence of mediastinal lymphadenopathy is a strong indication of the presence of malignancy 5) plural effusion 6) invasion of adjacent structures in the chest .Daniel Quinn and others⁹ analysed the radiographic presentation of bronchogenic carcinomas with reference to cell types and found that was no significant difference between adenocarcinoma or squamous carcinoma in presenting as peripheral or central tumors based on al large retrospective study of 345 patients of lung cancers. However Sharma and others¹⁰ reviewed the chest radiographs in 373 lung cancer patients and found that squamous carcinoma are more commonly presented as central mass and adeno carcinomas as peripheral tumors. In their review of radiological findings with histological cell type in 125 cases of lung cancers, ArnabSaha

et al¹¹ found squamous cell carcinomas mostly presented as collapse, unresolved consolidation or mass and adeno carcinomas presented as nodule , plural effusion and small cell carcinoma, large cell carcinoma, undifferentiated carcinoma presented as mass lesions on chest radiographs. Though chest radiograph is the initial radiological investigation in diagnosing lung cancer, CT scan chest is the most important imaging in further diagnosis, staging and management of these cases¹. In the present study, we found that solitary pulmonary mass is the most common radiological finding as described in the literature, followed by hilar , peri hilar mass. In four patients MD CT has detected the presence of malignancy which was missed on chest radiographs. Sone S. et al¹² retrospectively reviewed for the evidence of lung cancers on conventional chest radiographs in 44 histologically proven cases of lung cancers. They found that the chest radiography failed to detect 34 out of 44 cases identified on MD CT . Hence chest radiography is the most important in detecting suspicious cases of lung cancers and if detected in early stages it can help in providing radical treatment

IV. Conclusion

Conventional plain chest radiograph is the most sensitive initial imaging in diagnosing lung cancers and MDCT in further staging and management of these cases and in identifying unsuspected cases.

References

- [1]. Nilendu C Purandare and Venkatesh Rangarajan Imaging of lung cancer : implications on staging and management Indian J Radiol 2015 apr-jun; 25(2): 109-120
- [2]. Goldstraw P, Crowley J, Chansky K, Giroux DJ, Groome PA, Rami-Porta R, et al. The IASLC lung cancer staging project: Proposals for the revision of the TNM stage groupings in the forthcoming (seventh) edition of the TNM classification of malignant tumours. J Thorac Oncol 2007;2:706-14.
- [3]. Sat Sharma , chief editor, KavithaGarg Imaging in non small cell lung cancer emedicine-medscape. Com/article/358433-overview aug18, 2015.
- [4]. O' Donovan PB The radiologic appearance of lung cancer Oncology 1997 sep; 11(9): 1387-402.

- [5]. Mylene T. Truong,MD JaneP.Ko,MDSantiagoE.Rossi, MD Ignacio Rossi,MDChitra Viswanathan, MDJohn F. Bruzzi,MBBCh Edith M.Marom, MD Jeremy J.Erasmus MD.Update in the evaluation of the solitary pulmonary nodule Radiographics 2014; 34: 1658-1679.
- [6]. SambhaviVenkataraman MD,MRCP(UK) , Edward W.Bouchard MD ; Paul L Molina MD Radiologic evaluation of the solitary pulmonary nodule Applied radiology march 19, 20047) ViggianoRW,SwensenSJ,Rosenow EC 3rd Evaluation and management of solitary and multiple pulmonary nodules Clin Chest Med 1992; 13 (1): 83-95 Medline.
- [7]. Edward F.PatzJr, MD Imaging bronchogenic carcinoma CHEST 2000; 117/4/April/ 90S-95S
- [8]. Daniel Quinn, MD, FCCP; Adriane Gianlupi ,MD and Steven Broste MS he changing radiographic presentation of bronchogenic carcinoma with to cell types CHEST 1996; /110: 6/ December ; 1474-79
- [9]. Sharma CP,Behera D, AggarwalAN,GuptaD,Jindal SK Radiographic patterns in lung cancer
- [10]. Indian J Chest Dis Allied Sci 2002 jan-mar; 44(1): 25-30
- [11]. ArnabSaha, KaushikSaha, SantanuGhosh ,MrinmoyMitra,Prabodh
- [12]. Panchadhyayee,Adiya P Sarkar Chest x-ray of lung cancer ; association with pathological subtypes
- [13]. J Assoc Chest Physicians 2017; 5:76-8012) SoneS, LiF, YangZG, TakashimaS, Maruyama Y, Hasegawa M, WangJC,
- [14]. Kawakami S,Honda T Characteristics of small lung cancers invisible on conventional chest radiography and detected by population based screening using spiral C Br J Radiol 2000 fe;73(866) : 137-45



[1]. Fig 1 a)



b)



c)



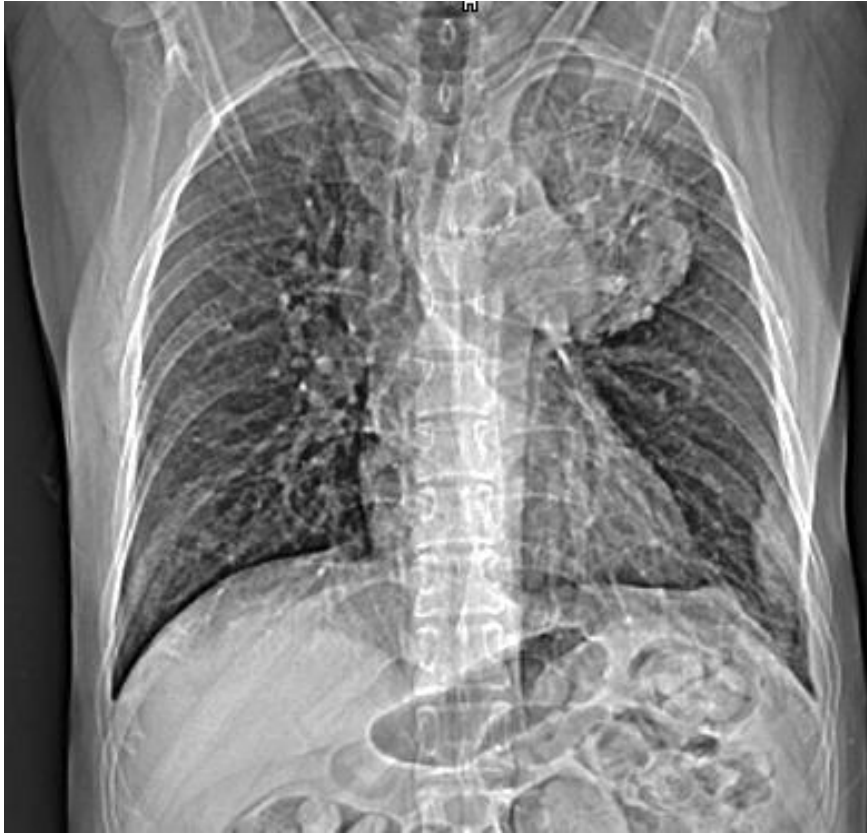
Fig 2 .a)



b)



c)



d)



Fig 3. a)



b)



Fig 4) a



b)



c)



Fig 5. a)



b)



Fig 6 a)



b)



c)



Fig 7 a)



b)



Fig 8 a)



b)



Fig 9:



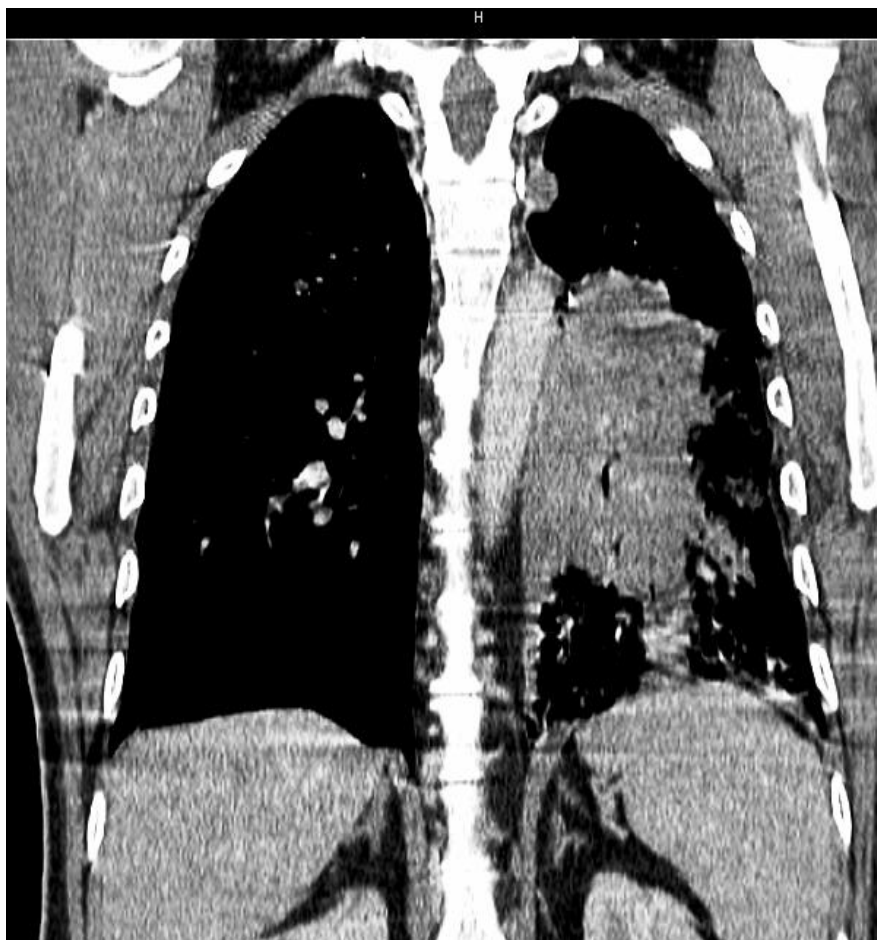
Fig 10



Fig 11)



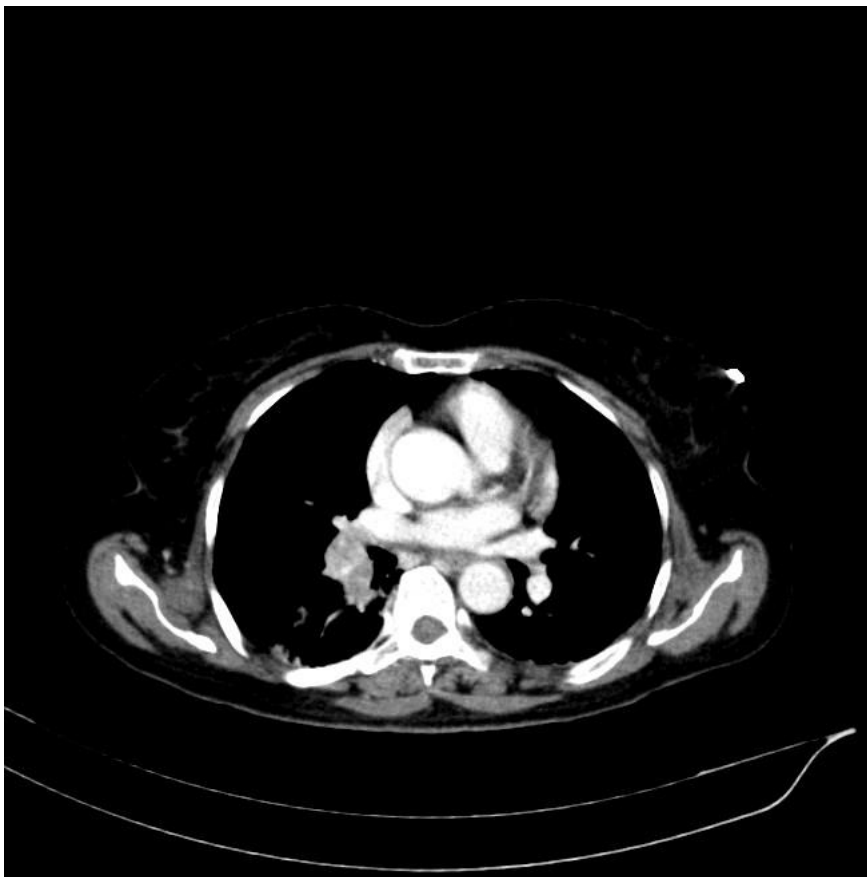
Fig 12 a)



b)



Fig 13 a)



b)

LEGENDS:

- Fig 1 a,b,c : chest images show solitary pulmonary nodule/mass
Fig 2 a-d : chest images show hilar and perihilar opacities.
Fig 3 a,b : chest images show non resolving consolidation
Fig 4 a,b,c : chest images show partial atelectasis
Fig 5 a,b : chest images show complete atelectasis
Fig 6 a,b,c : chest images show lobar consolidation/ mass
Fig 7a,b : chest radiographs show large plural effusion
Fig 8: a,b : chest images show apical mass
Fig 9: chest image shows hilar adenopathy
Fig 10: chest image shows peripheral mass
Fig11: chest image shows cavitary mass
Fig 12 a,b : retrocardiac mass on CT not seen on radiograph
Fig13: a,b : solitary pulmonary opacity seen on CT scan only

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