



## A Rare Case of Adenocarcinoma of the Lung in a Young Non-Smoker Male: A Case Report

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### Abstract

*Adenocarcinoma of the lung is the most common primary lung carcinoma seen globally. It falls under the group of non-small cell lung cancer (NSCLC) and has a strong established association with tobacco smoking. Due to the presence of numerous carcinogens present in tobacco smoke, primary or secondary exposure increases risk proportional to the amount of exposure. Other risk factors include family history of lung cancer or occupational exposure to agents like silica, asbestos, radon, heavy metals and diesel fumes, however the incidence with these agents are less prevalent when compared to tobacco exposure. As the name indicates, adenocarcinoma of the lung originates from the mucosal glands and represents approximately 35 to 40% of all lung cancers. The peculiarity of adenocarcinoma of the lung is that, it is the most common subtype to be diagnosed in people who have never smoked. Lung adenocarcinoma usually occurs in the lung periphery and may be found in scars or areas of chronic inflammation. Lung Adenocarcinoma in young is generally rare and mean age for lung malignancy is 65 years or older.*

**Keywords:** Adenocarcinoma, Lung, Crazy Paving Pattern, Lepidic Growth.

### Introduction

Adenocarcinomas constitute about half of all lung carcinomas in females and a lower percentage of those in males<sup>[1,2]</sup>. In absolute numbers, however, adenocarcinoma of the lung, particularly are more common in males than in females. A high percentage of adenocarcinomas arise in association with smoking and may show foci of atypical bronchiolar and alveolar proliferation in the neighboring air spaces. Grossly, adenocarcinomas usually present as poorly circumscribed gray-yellow lesions. They may be single or multiple and may secrete abundant

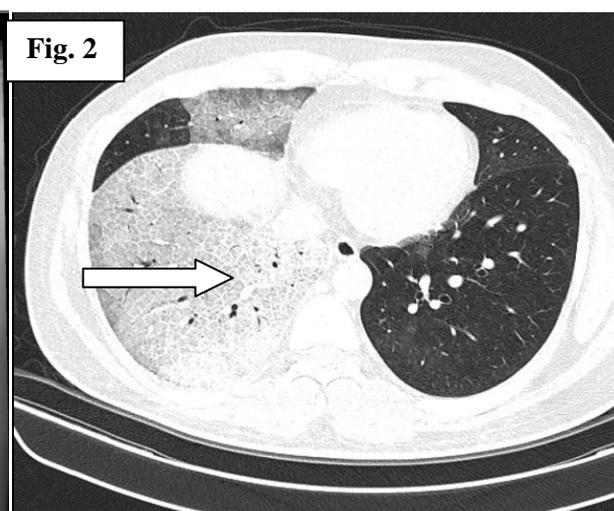
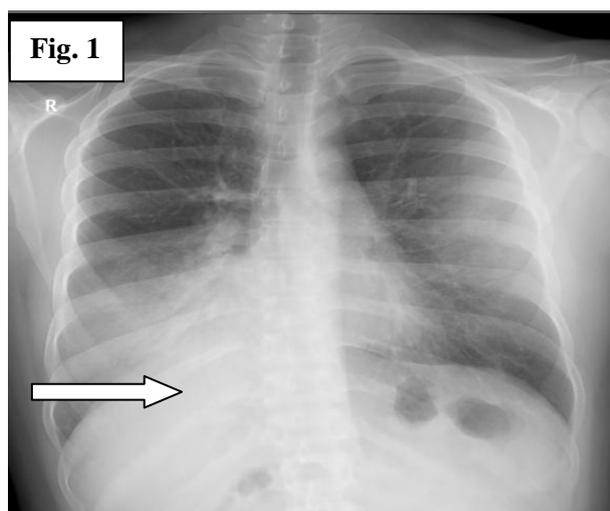
mucin, they have a gelatinous, glairy appearance<sup>[3]</sup>. Cavitation is extremely unusual. About 65% of the cases are located peripherally, and 77% involve the visceral pleura at the time of excision, often resulting in pleural fibrosis or 'puckering'. Occasionally, a small peripheral adenocarcinoma spreads massively into the pleural space and coats both pleural layers so as to closely simulate the appearance of diffuse mesothelioma (*pseudomesotheliomatous carcinoma*)<sup>[4,5,6]</sup>. Even rarer is the presentation of adenocarcinoma as a large endobronchial polypoid mass<sup>[7]</sup>. Microscopically, adenocarcinomas exhibit a wide

range of differentiation, one extreme blending with bronchioloalveolar carcinoma and the other with undifferentiated large cell carcinoma [6,8,9,10]. The two morphologic signs of glandular differentiation, often found together, are formation of tubules or papillae and secretion of mucin. This case report is about lepidic type of adenocarcinoma of the lung in a young non-smoker male.

### Case Report

A 27 year old male patient came with complaints of cough with occasional mucoid expectoration and breathlessness in exertion since 2 months – Grade II exertional dyspnoea. There is no history of fever, loss of appetite or loss of weight. Chest radiograph showed bilateral homogenous opacities more predominant on right lung. Computerized tomography scan (CT scan) of the chest was showed confluent ground glass opacities (GGO's) in lingula and upper lobe of the right lung with smooth interlobular septal thickening in right lower lobe and right middle lobe consistent with crazy paving pattern. Differential diagnoses (DDs) included atypical pneumonia, viral pneumonia and pulmonary alveolar proteinosis. He was treated as Pneumonia for 1 month without any clinical response. Further investigations such as bronchoscopy and

bronchoalveolar lavage were done from right lower lobe of the lung and sent for microbiological and cytological work-up. Microbiological work-up was negative for any infective pathogen and cytology finding revealed dense inflammation and negative for Periodic Schiff stain (PAS stain). Still, PAP was not ruled out as few patients can be PAS negative and biopsy positive. Rigid bronchoscopy with Real Time Cryo Lung Biopsy under fluoroscopy guidance was done for obtaining lung biopsy and the biopsy surprisingly revealed adenocarcinoma with lepidic pattern. Mutational analysis was sent and it revealed ALK rearrangement positive. Positron Emission tomography (PET) scan of the whole body was done subsequently which showed diffuse flourodeoxyglucose (FDG) tracer uptake in the ground glass opacities with interlobular septal thickening noted in right lower lobe, right middle lobe, consolidatory changes with focal increased FDG tracer uptake noted in posterior basal segment of the left lower lobe, patchy areas of ground glassing with interlobular septal thickening with diffuse increased FDG tracer uptake noted in bilateral lung fields. FDG uptake was noted in the right hilarnode measuring approximately (0.6 x 0.7 cm). Rest of the body has no FDG uptake. TNM staging T4 N1 M1- Stage IV.



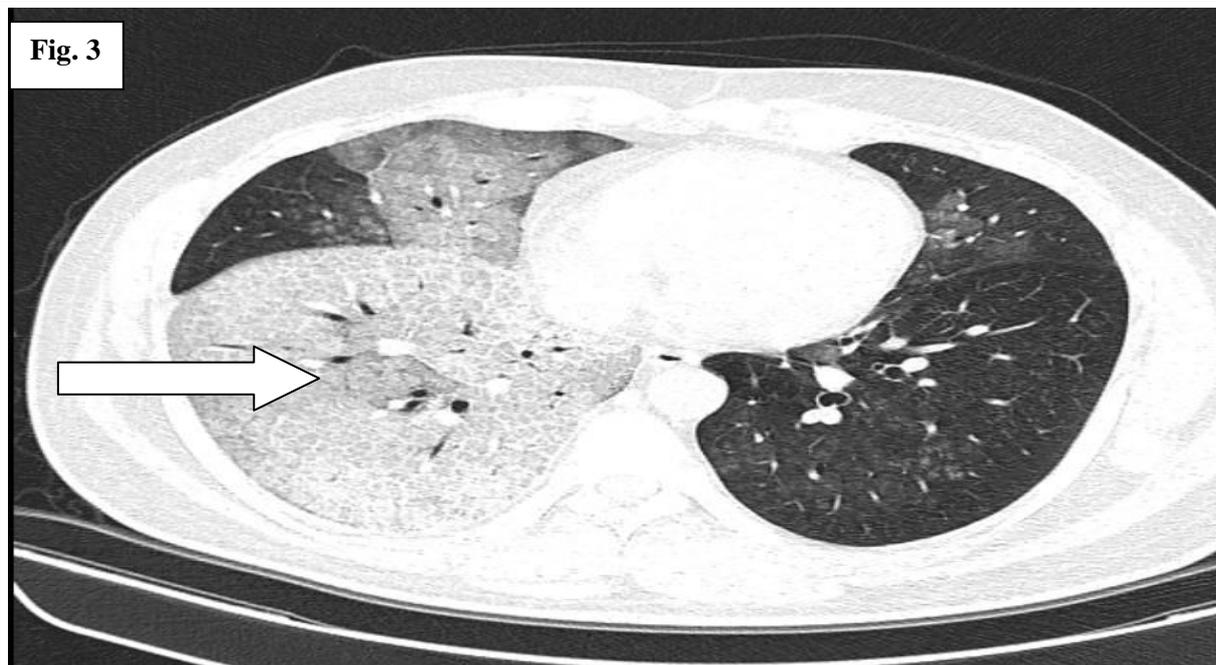


Fig. 3

**Figure 1** Chest radiograph showing bilateral homogenous opacities - predominant on right side (marked by arrow).

**Figure 2 and 3-** Computerized tomography scan (CT scan) of the chest showed confluent ground glass opacities (GGO's) in lingula and upper lobe of the right lung with smooth interlobular septal thickening in right lower lobe and right middle lobe consistent with crazy paving pattern (marked by arrow).

### Discussion

Lung Malignancy is the leading cause of cancer-related death and is the second most common malignancy reported in the United States and globally. It is expected that in 2020, there will be 228,820 new cases of lung cancer and 135,720 deaths from lung cancer<sup>[11]</sup>. The total number of deaths caused by lung cancer exceeds the total number of deaths caused by colon, prostate, and breast cancer combined. This poor outcome in lung cancers is due, in part, to the fact that more than half of the patients, or approximately 55%, had metastatic lung cancer at the time of diagnosis and non-small cell lung cancer (NSCLC) accounted for approximately 85 percent of newly diagnosed lung cancer cases<sup>[11]</sup>.

Mutations of EGFR, ALK, ROS1, and BRAF helps in assessing the prognosis and response to the treatment. Incidence of adenocarcinoma is very rare in young patients and adenocarcinoma with lepidic pattern is still a rare occurrence. There have been very few case reports by few authors globally who reported adenocarcinoma in

older age group. Incidence of adenocarcinoma of the lung in a 27 year old is a very rare occurrence. Gui et al reported adenocarcinoma in a 52 year old patient with EGFR mutation<sup>[12]</sup>, Rogers et al and Shannon et al reported mucinous adenocarcinoma in a 65 year old and 56 year old patients respectively<sup>[13,14]</sup>, Zhang et al reported adenocarcinoma of the lung in a 39 year old patient<sup>[15]</sup>. (This case report according to the extensive search of literature from various sources, probably the first case of adenocarcinoma in a 29 year old male, non-smoker patient.) According to the available clinical data, Mean age of Lung malignancy is 65 years or older. This is a case of very rare occurrence of Lepidic pattern of Adenocarcinoma.

### Conclusion

Crazy paving pattern in CT scan should include differential diagnoses of lung malignancy, adenocarcinoma of the lung with lepidic growth or bronchoalveolar carcinoma (BAC). Adenocarcinoma with Lepidic growth is generally

seen in elderly population but such patterns should be suspected in young individuals based on radiological appearance. Adenocarcinoma in young individuals is not that common but it should be a differential with such pattern. In Non-Resolving Pneumonia, Real Time Cryo-TBLB (Cryo Transbronchial Lung Biopsy) under fluoroscopy guidance is an effective method for obtaining Biopsy sample for Histological and Mutational or Genetic analysis.

## References

1. Bennett DE, Sasser WF, Ferguson T: Adenocarcinoma of the lung in men. A clinicopathologic study of 100 cases. *Cancer* 1969; 23:431-439.
2. Vincent TN, Satterfield JV, Ackerman LV: Carcinoma of the lung in women. *Cancer* 1965; 18:559-570.
3. McElvaney G, Miller RR, Muller NL, Nel ems B, Evans KG, Ostrow DN: Multicentricity of adenocarcinoma of the lung. *Chest* 1989; 95:151-154.
4. Dessy E, Pietra GG: Pseudomesotheliomatous carcinoma of the lung. An immunohistochemical and ultrastructural study of three cases. *Cancer* 1991; 68:1747-1753.
5. Harwood TR, Gracey DR, Yokoo H: Pseudomesotheliomatous carcinoma of the lung. A variant of peripheral lung cancer. *Am J Clin Pathol* 1976; 65:159-167.
6. Moran CA: Pulmonary adenocarcinoma: the expanding spectrum of histologic variants. *Arch Pathol Lab Med* 2006; 130:958-962.
7. Kodama T, Shimosato Y, Koide T, Watana be S, Yoneyama T: Endobronchial polypoid adenocarcinoma of the lung. Histological and ultrastructural studies of five cases. *Am J Surg Pathol* 1984; 8:845-854.
8. Kerr KM: Pulmonary adenocarcinomas: classification and reporting. *Histopathology* 2009; 54:12-27.
9. Linnoila RI: Pathology of non-small cell lung cancer. New diagnostic approaches. *Hematol Oncol Clin North Am* 1990; 4:1027-1051.
10. Terasaki H, Niki T, Matsuno Y, Yamada T, Maeshima A, Asamura H, Hayabuchi N, Hirohashi S: Lung adenocarcinoma with mixed bronchioloalveolar and invasive components. *Am J Surg Pathol* 2003; 27:937-951.
11. Shikha S. Immunotherapy Resistance in Non-Small Cell Lung Cancer. *Oncol Cancer Case Rep.* 2021, 07(9), 001-001.
12. Gui X, Ding J, Li Y, Yu M, Chen T, Huang M, et al. Lung carcinoma with diffuse cystic lesions misdiagnosed as pulmonary langerhans cell histiocytosis: a case report. *BMC Pulm Med.* 2020; 20: 30.
13. Rogers C, Kent-Bramer J, Devaraj A, Nicholson AG, Molyneaux PL, Wells AU, et al. Rapidly progressive cystic lung disease. *Am J Respir Crit Care Med.* 2018; 198: 264.
14. Shannon VR, Nanda AS, Middleton LP, Faiz SA. Pulmonary mucinous cystadenocarcinoma presenting as extensive multifocal cystic lesions. *Am J Respir Crit Care Med.* 2017; 195: 1267–8.
15. Zhang J, Zhao YL, Ye MX, Sun G, Wu H, Wu CG, et al. Rapidly progressive diffuse cystic lesions as a radiological hallmark of lung adenocarcinoma. *J Thorac Oncol.* 2012; 7: 457–8.