Case Report

Primary adenocarcinoma of lung in a 24 year old never smoker

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Abstract

Lung cancer is the commonest cancer in the world. Tobacco smoking is by far the most predominant risk factor of lung cancer. However a variety of genetic and environmental risk factors, occupational exposure to asbestos, arsenic, nickel, silica and polycyclic aromatic hydrocarbon also plays a role in lung cancer. Lung cancer is rare in young age. We report a case of a young man 24 year old, never-smoker, with no family history of malignancy, and no past history of tuberculosis or chronic obstructive bronchitis, who presented with cough, right sided chest pain and shortness of breath for 1 month duration. Patient was a manual labourer for 6 years. Clinicoradiologically, he was diagnosed as a case of right sided pulmonary consolidation with parapneumonic pleural effusion. CT guided FNAC from consolidation of right lung revealed adenocarcinoma. Chemotherapy was started and the follow-up is uneventful till now.

Keywords: Lung cancer, young man, adenocarcinoma, never-smoker.
Abbreviation: NSCLC-Non small cell lung cancer.

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INTRODUCTION

Lung cancer is the most common cancer worldwide, with about 1.8 million new cases and 1.6 million deaths in 2012.[1] A shift in histological types of lung cancer is occurring now, with a decline in squamous cell carcinoma and a surge of adenocarcinoma specially in females and male never-smokers. Adenocarcinoma is the most common histologic subtype of lung cancer in most countries, accounting for almost half of all lung cancers.[2] Though smoking is the most common risk factor of lung carcinoma, overall global statistics estimate that 15% of lung cancer in men and upto 53% in women are not attributable to smoking, with never-smokers accounting for 25% of all lung cancer cases worldwide.[3] Genetic factors and occupational exposure to asbestos, arsenic, nickel, silica and polycyclic aromatic hydrocarbon also plays role in development of lung cancer.[4] Common gene mutations responsible for adenocarcinoma are *KRAS, EGFR, TP53.* We report a case of a 24-year-old never-smoker male patient with primary pulmonary adenocarcinoma, presenting with a short history of respiratory symptoms.

CASE REPORT

A 24 years young man, never-smoker, manual labourer presented with cough, right sided chest pain and shortness of breath for 1 month with low grade fever. A chest radiograph showed total opacification of right hemithorax. There was history of diagnostic and therapeutic thoracocentesis on two occasions, prior to hospitalization (1litre each time 3 days apart). Pleural fluid was lymphocytic, exudative with ADA 10U/L and negative for malignant cell. Patient did not improve on

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conservative management and subsequently his symptoms worsened, and an intercostals tube drainage introduced. CECT thorax was done next which showed passive compression of right lung with collapse and consolidation. CT guided FNAC from right lung consolidation done and it was suggestive of well differentiated adenocarcinoma. Opinion from oncologist was taken and repeat thoracocentesis was done. This time, the cytology report was positive for malignant cells making it a stage IV tumor. Urgent chemotherapy with paclitaxel and carboplatin initiated. Patient responded well to chemotherapy and now is under follow-up.

Figure 1: Chest X-ray PA view showing complete opacification of right hemithorax

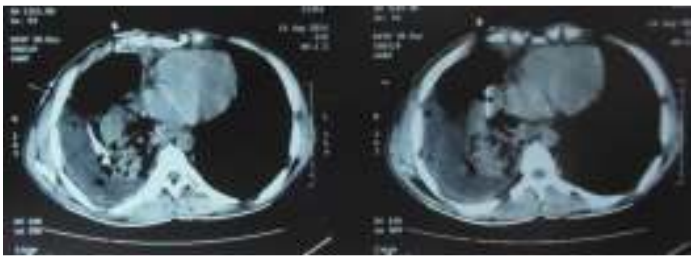

Figure 2: CT scan thorax with CT guided FNAC from right lung consolidation

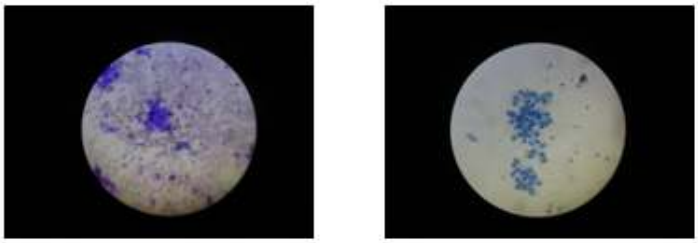

Figure 3: FNAC from right lung consolidation showing well differentiated adenocarcinoma

DISCUSSION

Lung cancer is the leading cause of cancer related death worldwide, with NSCLC accounting for 85% of all lung cancers.[5] Adenocarcinoma of the lung is the commonest type and its incidence is increasing among nonsmoker females and young male never-smokers. Although smoking-related carcinogens act on both proximal and distal airways inducing all the major forms of lung cancer, cancers arising in never-smokers target the distal airways and favour adenocarcinoma histology.[6] Never-smokers with lung cancer present with more advanced disease, usually at an earlier age, again suggesting a biologically different disease from tobacco-related lung cancer and this is similar to our case.[6] In the study by Gadgeel *et al,*[7] over a 4-year period with 1,012 lung cancer patients, 12.5% patients were under 50 years of age at diagnosis, of which only one (0.8%) was less than 30 years of age, suggesting the rarity of the tumor at this age group. The association of tobacco smoking is high with development of small cell lung cancer and squamous cell lung cancer than with adenocarcinoma. Genetic factors may have a role in development of adenocarcinoma in young adults without any smoking history. Mutation of EGFR, KRAS, TP53 have been associated with higher risk of development of adenocarcinoma. Many studies about the prevalence and specificity of *KRAS* and *EGFR* alterations in lung adenocarcinoma have been done. The frequency of *KRAS* and *EGFR* mutations is each 10 to 30% with higher *EGFR* mutation frequency in Asians, never smokers, and nonmucinous tumors, whereas *KRAS* mutations are most common in non-Asians, smokers, and in invasive mucinous adenocarcinoma.[8] Although epidemiological study of Indian lung cancer is scarce, in one such study,

majority of the patients were non-smokers (52%), adenocarcinoma being the most common histological type overall as well as in non-smokers.[9] The median age of non-smokers was significantly lower than that of smokers.[9] The above findings corroborate with our patient profile.

CONCLUSIONS

Incidence of primary adenocarcinoma is increasing in non smoker young adults. A high index of suspicion is required for prompt diagnosis and treatment. Risk factors other than smoking including genetic mutations should be carefully studied for better understanding of the pathophysiology in this population.

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