

Case Report

Case report: Hidden Adenocarcinoma of the lung in an obese non-smoker presented with pulmonary embolism

Anura Abeysundara^{1*}, SDB Jayakody², JJKH Udupihille³,
Jeewantha Rathnayake⁴


¹Senior Lecturer and Consultant Anesthetist, Faculty of Medicine, University of Peradeniya, Sri Lanka

²Senior House officer in anesthetics, Teaching Hospital Peradeniya, Sri Lanka

³Senior Lecturer and Consultant Radiologist, faculty of Medicine, University of Peradeniya, Sri Lanka

⁴Senior Lecturer and Consultant Surgeon, faculty of Medicine, University of Peradeniya, Sri Lanka

*Corresponding author email: anuraabeysundara@gmail.com

	International Archives of Integrated Medicine, Vol. 11, Issue 2, February, 2024. Available online at http://iaimjournal.com/ ISSN: 2394-0026 (P) ISSN: 2394-0034 (O)
	Received on: 12-2-2024 Accepted on: 21-2-2024 Source of support: Nil Conflict of interest: None declared. Article is under Creative Common Attribution 4.0 International DOI: 10.5281/zenodo.10693997
How to cite this article: Anura Abeysundara, SDB Jayakody, JJKH Udupihille, Jeewantha Rathnayake. Case report: Hidden Adenocarcinoma of the lung in an obese non-smoker presented with pulmonary embolism. Int. Arch. Integr. Med., 2024; 11(2): 22-25.	

Abstract

Background: Lung carcinomas are responsible for the highest number of deaths among cancers in the world. The annual new incidences exceed 2.1 million, only secondarily to breast cancer. 70% of cases occur in smokers. The majority is presented with insidious onset features of chronic cough, shortness of breaths, recurrent pneumonias, weight loss and lethargy. Majority of incidentally found patients, who are asymptomatic are in the early stages, hence have a chance for surgical resection with a better prognosis.

Case report: This 44-year-old obese, non-smoking male patient presented with a short duration of pneumonia and venous thromboembolism (VTE) and a sudden onset of pulmonary embolism (PE). A secondary deposit found in the liver suggested an adenocarcinoma of the lung by immunohistochemistry. At the time of presentation, it was classified as stage 4. The patient had to be ventilated due to the respiratory difficulty accompanied with obesity, PE and pneumonia. Unfortunately, patient died seven days following admission to intensive care unit (ICU), not allowing for chemotherapy, which was the option of treatment.

Conclusion: Hidden carcinoma of the lung can easily be missed in a non-smoker who is at a lower risk for lung cancer. Presence of VTE and PE in an obese non-smoker may mask the diagnosis further. Extreme vigilance, complete and thorough investigations are needed to diagnose a hidden carcinoma of the lung.

Key words

Adenocarcinoma of the lung, Venous thromboembolism, Immunohistochemistry of lung cancer.

Introduction

According to the world Health Organization (WHO) estimates in 2019, cancer is the first or second cause of death before the age of 70 years in 112 out of 138 countries [1]. The lung cancer remains on top of the list to cause deaths, following any cancer. Even though the smoking is the leading identified cause for lung cancer, incidence in non-smokers are rising in recent years.

Case report

This 44-year-old, obese (105 kg) male, non-smoker was referred from a peripheral hospital in the Tea-estate sector, in the middle of the country with a history of a few days of fever and cough followed by a sudden onset shortness of breath. He was tachypneic, respiratory rate was 30 breaths per minute. On air saturation was 93%. On examination his air entry on right side of the lung was reduced. He had a mild swelling of the left lower limb, which was persistent for 2 days. He was a non-hypertensive and non-diabetic. ECG looked normal except tachycardia.

There was a hazy shadow on the right lower zone in the Chest X-ray (CXR). CRP was 120. CT pulmonary angiogram (CTPA) revealed bilateral pulmonary embolism (PE) and doppler scan revealed left side lower limb deep vein thrombosis (DVT). The initial diagnosis was PE, DVT and right-sided lower lobe pneumonia.

Antibiotics were started following sputum and blood culture sampling. Enoxaparin treatment dose was started. Later he was intubated and ventilated as the respiration was not satisfactory. Further, ultrasound (US) revealed, right sided moderate pleural effusion with consolidation and

liver metastasis. A bronchoscopy was done to find out evidence of a bronchial carcinoma. A sampling for histology was not possible as there was no clue of a new growth. Following temporary cessation of anticoagulants, US guided liver biopsy was done which revealed a secondary deposit of an adenocarcinoma. Presence of TTF-1, in further Histochemical analysis, suggested a primary adenocarcinoma of the lung.

The stage of the carcinoma was Grade 4 which was beyond surgical resection. The plan was to start chemotherapy. Unfortunately, patient died on the 7th day following admission to ICU.

Discussion

Incidence

The Global cancer statistics in 2020 (GLOBOCAN) has estimated 19.3 million new cancer cases and 10 million cancer deaths in 2020. Until recent times, the lung cancer had the highest number of new incidents among all cancers annually [2], which was taken over by the female breast cancer (incidence of 2.261 million new cases) in 2020. The new incidence of lung cancer remains at 2.206 million accounting to 11.4% of all cancer incidences. The prostate (7.3%), non-melanoma of the skin (6.2%), colon (6%), stomach, liver and rectum follow the list of new cancer incidences in 2020 [3].

Even though the incidence of lung cancer remains secondary to female breast cancer, it is responsible for the highest number of deaths (1.796 million) amounting to 18% of all deaths from cancers in 2020, followed by the liver cancer (8.3%) [3].

Presentation

The common presentations of lung cancer include cough, shortness of breath, recurrent chest infections, hemoptysis and more generalized symptoms like malaise and poor appetite [4]. The duration varies. This patient was asymptomatic until a few days back and presented with pneumonia and DVT, complicated by PE. The most curable lung cancers present with no symptoms and found incidentally, if they are in the initial stages.

Etiology

Tobacco smoking is responsible for 70% of lung cancers. Chlamydia pneumonia is implicated in some cases of lung cancers following smoking [5]. This patient did not have a smoking history. Never-smokers with lung cancers usually presented late as there is no etiology to be suspected [6]. In never smoking group, various factors have been identified. The oldest occupational lung cancer is associated with mining workers who were exposed to Uranium and Radium in soil and rock [5]. Other occupation related lung cancers are associated with Asbestos and other industrial agents including Diesel fumes. Chronic obstructive pulmonary diseases (COPD) and some viruses (HPV-16, 18), EBV, CMV are also implicated in lung cancers, in some Asian countries.

Venous thromboembolism (VTE)

VTE is a common complication in malignancies. Lung cancer is included into a group which has a highest incidence of VTE. Thrombotic events in cancer patients depend on individual patient, the type of cancer and the treatment related factors. This patient was obese and had an adenocarcinoma of the lung, both of which were considered as high-risk factors for VTE. Other factors include advanced disease, non-small cell lung cancers (NSCLC), pneumonectomy and chemotherapy [7].

This patient presented with DVT, followed by bilateral pulmonary embolisms in distal and segmental pulmonary arteries, within a few days of onset of symptoms. The data pooled from the

publications on the incidence of PE, searched through PubMed, from 1900 to 2017, found 3.7% of PE in lung cancers (1172 out of 31294), of which majority occurred during chemotherapy [8]. In a retrospective study involving more than 2500 CT pulmonary angiograms (CTPA), the incidence of PE in lung cancer group was 16%, higher than other cancer groups. They showed less incidence of bilateral or central PE [9].

Diagnosis with immunohistochemistry

Before 2015, in the older WHO classification, lung cancer subtypes were identified based on the surgical specimen, but new WHO categorizations with recent advancements in immunohistochemistry has allowed to analyze small biopsies and cytology, when a large sample cannot be taken. Morphologically, presence of acinar and tubular structures is more suggestive of adenocarcinoma, while the presence of keratinization and intercellular bridges are suggestive of squamous cell carcinomas. Presence of TTF-1 in this specimen from the liver secondary deposit is suggestive of adenocarcinoma of the lung. Napsin is another specific marker for the adenocarcinoma of the lung. Presence of p40 is more favorable to have a squamous cell carcinoma of the lung [10].

Conclusion

Hidden carcinoma of the lung can easily be missed in a non-smoker who is at a lower risk for lung cancer. Presence of DVT and PE in an obese non-smoker may mask the diagnosis further. Extreme vigilance, complete and through investigations are needed to diagnose a hidden carcinoma of the lung.

Acknowledgement

Our sincere appreciation to the family of the patient for granting permission to publish this.

References

1. World Health Organization. Global Health Estimates 2020: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019. Geneva, World Health

- Organisation. [Internet]. World Health Organization. 2020. Available from: https://www.who.int/healthinfo/global_burden_disease/en/
2. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.*, 2018; 68(6): 394–424.
 3. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin.*, 2021; 71(3): 209–49.
 4. McGonigle N. Lung cancer. *Surg (United Kingdom)* [Internet]., 2020; 38(5): 249–54. Available from: <https://doi.org/10.1016/j.mpsur.2020.03.008>
 5. Bade BC, Dela Cruz CS. Lung Cancer 2020: Epidemiology, Etiology, and Prevention. *Clin Chest Med* [Internet]., 2020; 41(1): 1–24. Available from: <https://doi.org/10.1016/j.ccm.2019.10.001>
 6. Cufari ME, Proli C, De Sousa P, Raubenheimer H, Al Sahaf M, Chavan H, et al. Increasing frequency of non-smoking lung cancer: Presentation of patients with early disease to a tertiary institution in the UK. *Eur J Cancer* [Internet]., 2017; 84: 55–9. Available from: <http://dx.doi.org/10.1016/j.ejca.2017.06.031>
 7. Vitale C, D’Amato M, Calabrò P, Stanziola AA, Mormile M, Molino A. Venous thromboembolism and lung cancer: a review. *Multidiscip Respir Med* [Internet]., 2015; 10(1): 28. Available from: <https://doi.org/10.1186/s40248-015-0021-4>
 8. Li Y, Shang Y, Wang W, Ning S, Chen H. Lung cancer and pulmonary embolism: What is the relationship? A review. *J Cancer*, 2018; 9(17): 3046–57.
 9. Anagnostopoulos I, Lagou S, Spanorriga MK, Tavernaraki K, Poulakou G, Syrigos KN, et al. Epidemiology and diagnosis of pulmonary embolism in lung cancer patients: is there a role for age adjusted D-dimers cutoff? *J Thromb Thrombolysis* [Internet]., 2020; 49(4): 572–7. Available from: <https://doi.org/10.1007/s11239-019-02003-8>
 10. Inamura K. Update on immunohistochemistry for the diagnosis of lung cancer. *Cancers (Basel)*., 2018; 10(3): 1–15.