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RESEARCH ARTICLE

AN INTERESTING CASE OF LUNG CARCINOMA MASQUERADING AS THROMBOEMBOLIC EVENTS

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Abstract: Adenocarcinoma, a type of lung cancer is known to pose a risk of blood clot related issues like Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE). In this case report, we have a 62-year-old woman who initially complained of pain and swelling in her left calf muscle along with breathing difficulties and a dry cough. Initial examinations revealed discovered DVT in her left leg and elevated levels of D-dimer prompting further investigations. Subsequent scans revealed a PE and multiple nodules in the lungs eventually leading to a diagnosis of lung adenocarcinoma following a biopsy guided by CT scan. This case emphasizes the connection between cancer and blood clotting issues stressing the importance of considering underlying cancers when patients exhibit unexplained symptoms related to blood clots. The patient underwent treatment involving both chemotherapy and blood thinners to address both the cancer and the blood clotting issues. Despite advancements in diagnosing and treating conditions the presence of blood clot related complications in cancer patients still indicates a challenging prognosis and highlights the need, for timely identification and comprehensive management strategies.

Keywords: Lung carcinoma, Thromboembolic events, Deep vein thrombosis, Pulmonary embolism, Adenocarcinoma

INTRODUCTION

Cancer patients often face the challenge against Deep Vein Thrombosis (DVT) leading to increased risks of morbidity and mortality. DVT is more prevalent among cancer patients those with lung cancer where rates range from 4% to 17% among individuals with underlying cancers. Lung cancer ranks second in causing fatalities for both men and women accounting for a quarter of all cancer related deaths and surpassing combined deaths from breast, prostate and colorectal cancers (1). While smoking is commonly linked to lung cancer cases there is also a number of cases in nonsmokers showcasing the complex nature of this disease (2).

Despite progress in treatments and early detection methods like low dose CT scans the survival rates for lung cancer over five years remain disappointingly low due to late-stage diagnoses being typical (3). The heightened risk of clotting problems associated with malignancies plays a role, particularly in cancers such as pancreatic, brain, renal, lung and ovarian cancers which experience high rates of venous thromboembolism events (1). Understanding the link between DVT and lung cancer is crucial, as having cancer significantly increases the likelihood of facing blood clot complications that complicate patient care.

In this case report, we explore the case presentation, diagnosis, treatment process, and follow-ups of a 62-year woman who first showed signs of DVT. Further examination revealed that she had lung adenocarcinoma highlighting the connection between clotting problems and cancer. This case emphasizes the importance of being vigilant and using thorough diagnostic methods in patients with thromboembolic incidents, especially those, with underlying cancer. By examining this case we aim to improve our understanding of how DVT and lung cancer interact ultimately leading to patient outcomes through enhanced diagnostic and treatment approaches.

RESULTS AND OBSERVATIONS:

Case Presentation:

The vascular surgery outpatient department was visited by a 62-year-old female patient with complaints of left calf muscle pain and swelling that had persisted for two months. She also reported experiencing shortness of breath (MMRC grade 3) and a dry cough for the past month. Additionally, the patient noted a loss of appetite and an unquantified amount of weight loss. Given her respiratory complaints, she was referred to the department of respiratory medicine for further evaluation.

Upon general examination, the patient was conscious, oriented, afebrile, and exhibited mild pallor. Pedal oedema of the left lower leg was also noted. Systemic examination of the respiratory system revealed decreased breath sounds in the right infra-axillary, basal, axillary, and interscapular regions, suggesting an underlying pathology that warranted further investigation. A haemoglobin level of 8.9 g/dL, a total leukocyte count of 12,260/µL, and a platelet count of 469,000/µL were reported by initial blood investigations.The patient's D-dimer levels were significantly elevated at 4200 ng/mL,

indicative of a hypercoagulable state and prompting further imaging studies. A lower limb Doppler ultrasound was performed, which revealed the presence of a deep vein thrombus (DVT) in the left lower limb, confirming the clinical suspicion of thromboembolic disease (Figure-1).

To investigate the possibility of pulmonary involvement, a CT pulmonary angiography was conducted (Figure-2). This imaging study showed a filling defect in the right lower lobe segmental branches, suggestive of acute Pulmonary Thromboembolism (PTE). Additionally, multiple discrete subpleural and intraparenchymal nodules were observed, indicative of pulmonary metastasis. A right pleural effusion was also present, further raising concerns about a malignant process.

To establish a definitive diagnosis, a CT-guided biopsy of the pulmonary nodules was performed. Histopathological examination of the biopsy specimen revealed adenocarcinoma of the lung. This finding confirmed that the patient's thromboembolic events were secondary to an underlying malignancy. Given the diagnosis of lung adenocarcinoma with metastatic disease, a multidisciplinary approach to treatment was initiated.

The patient was started on chemotherapy with a regimen that included Paclitaxel and Cisplatin, following a consultation with a medical oncologist. In addition to chemotherapy, oral anticoagulants were prescribed to manage the thromboembolic events and reduce the risk of further complications. The initiation of anticoagulation therapy was crucial in managing the patient's hypercoagulable state, which was exacerbated by the presence of malignancy.

Cancer patients, especially those with lung cancer, are predisposed to thromboembolic events, with an estimated risk ranging from 4% to 17%. Malignancies can create a prothrombotic state, which may be asymptomatic or lead to conditions such as pulmonary thromboembolism (PTE). Patients with malignancies and DVT face an increased risk of complications and secondary venous thromboembolism (VTE). Among the various histological types of lung cancer, adenocarcinoma is the most common in patients presenting with DVT. Studies have shown that the presence of DVT in lung adenocarcinoma is a poor prognostic indicator, regardless of the cancer stage, due to decreased clotting time and increased plasminogen activator inhibitor levels.

In this case, the diagnosis of lung cancer was made only after the patient presented with DVT, highlighting the importance of considering underlying malignancies in patients with unexplained thromboembolic events. The delay in diagnosis, associated with the advanced stage of the disease at presentation, underscores the need for early and thorough investigations in patients with DVT and symptoms such as dyspnoea, cough, and constitutional symptoms. Prompt diagnosis and initiation of appropriate treatment can significantly impact the prognosis and quality of life for these patients.

Despite the administration of proper anticoagulation therapy, the overall survival rate in patients with cancer-associated thrombosis (CAT) who develop DVT is lower compared to those who do not develop DVT. This case illustrates the complex interplay between thromboembolic events and malignancy and highlights the challenges in managing patients with advanced cancer. Early diagnosis and a comprehensive treatment approach are essential in improving outcomes and reducing morbidity and mortality in patients with cancer-associated thromboembolic events.

Figures:

Figure-1: Chest X-Ray Image

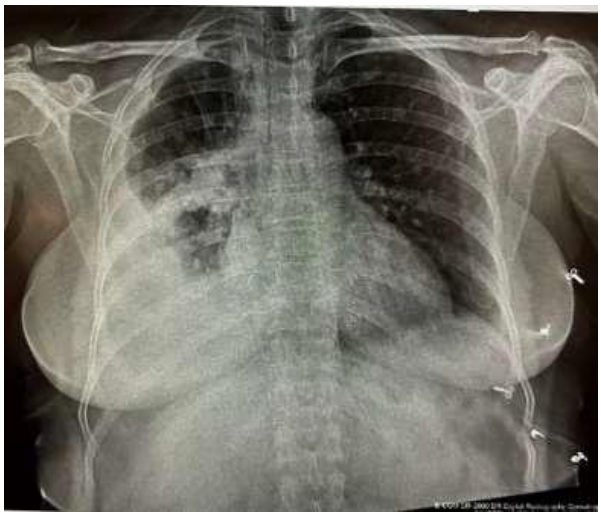
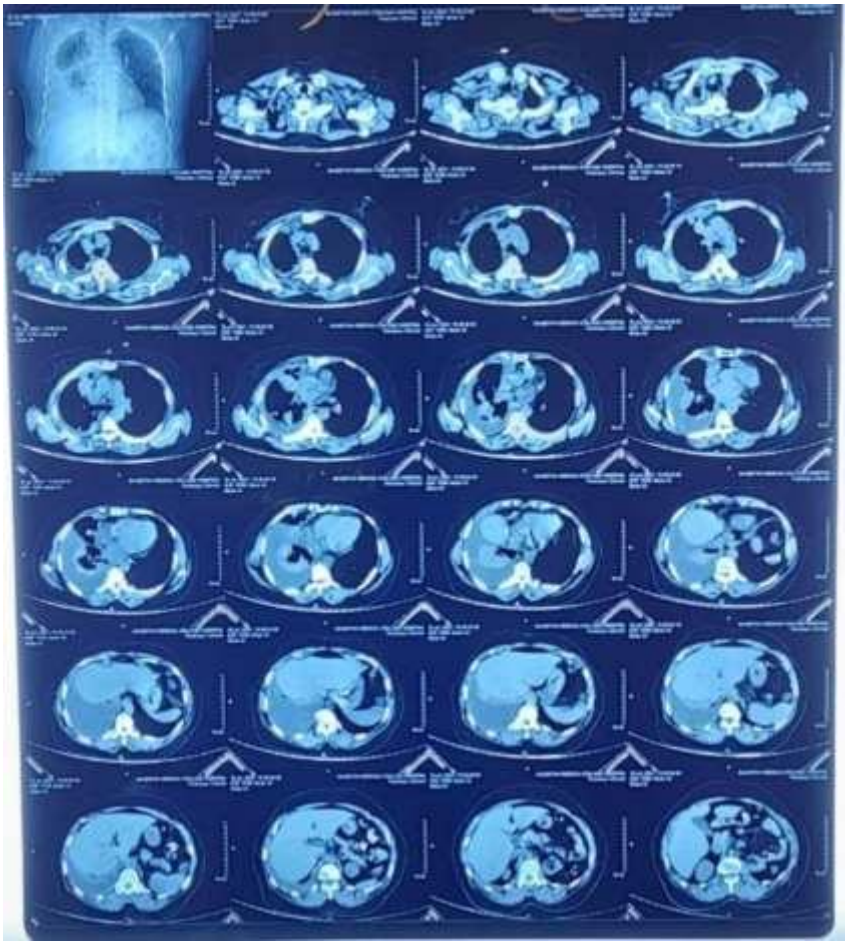


Figure-2: CT pulmonary angiography



DISCUSSION

Lung cancer commonly shows symptoms, with blood clotting events such as Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE) being particularly important in affecting patient outlook and care. It is well known that cancer patients have a 4 to 17% chance of developing DVT and up to 7% risk of Venous Thromboembolism (VTE) during their illness progression (4, 5). This discussion delves into the connection between blood clotting events and lung cancer specifically focusing on adenocarcinoma illustrated through a scenario where a 62-year-old woman presented with DVT and was later diagnosed with lung adenocarcinoma.

In this case the 62-year-old woman experienced pain and swelling in her left calf muscle along with breathlessness and a dry cough. Initial tests revealed DVT and high D-dimer levels prompting concerns about blood clots. Further scans identified embolism and lung metastasis. A biopsy guided by CT scan confirmed adenocarcinoma of the lung. This case highlights the importance of considering cancers in patients experiencing blood clotting events as early detection and treatment can significantly impact outcomes.

The relationship between cancer and blood clotting events is intricate often resulting in complications like DVT and PE due, to cancer induced increased likelihood of blood clots (6). Malignancies, lung adenocarcinoma can lead to a prothrombotic state by triggering factors that enhance blood clotting, such as increased production of clotting agents platelet aggregation caused by tumour cells and damage to blood vessel linings (7, 8). Research has shown that the presence of DVT in individuals with lung cancer is linked to more advanced stages of the disease and a less favourable prognosis regardless of the cancers initial stage (9). This connection underscores the importance of monitoring for blood clot related events in cancer patients especially those experiencing respiratory issues and unexplained general symptoms (10).

Mahajan and colleagues carried out a comprehensive study that looked into the occurrence and factors contributing to risk and consequences of Cancer Related Blood Clots (CAT) in individuals with the 13 most prevalent types of cancer in California. Their findings revealed a growing trend in CAT cases over the years mainly attributed to an uptick in embolism and DVT. Moreover, their study indicated that CAT was linked to mortality rates across all forms of cancer underscoring the urgent importance of early identification and treatment for, at risk patients (4).

Individuals diagnosed with both cancer and blood clotting complications are at a risk of experiencing severe outcomes and mortality compared to those without such manifestations. This elevated risk is attributed to the increased tendency for blood coagulation triggered by malignancies, which can complicate treatment with anticoagulants (11). Studies suggest that patients with lung adenocarcinoma and DVT have a mortality rate emphasizing the need for a comprehensive approach combining anticoagulant therapy with cancer treatments to effectively manage both conditions (12, 13).

Various risk assessment models and prediction tools like the Khorana Risk Score (KRS) have been created to evaluate the likelihood of VTE in individuals, with cancer including those diagnosed with lung cancer (14). High values of KRS have been linked to mortality rates highlighting the importance of using such tools in clinical settings to identify at risk patients and apply preventive measures (15). Biomarkers like platelet lymphocyte ratio (PLR) and advanced disease stages also serve as indicators for VTE in Non-Small Cell Lung Cancer (NSCLC) patients (16, 17).

While there have been strides in understanding and managing cancer related blood clots guidelines for blood thinning in lung cancer patients vary. The American College of Chest Physicians (ACCP) does not advise clot prevention whereas the European Society for Medical Oncology (ESMO) and the American Society of Clinical Oncology (ASCO) suggest evaluating each case individually and considering prevention for hospitalized patients (11, 18). The International Society on Thrombosis and Haemostasis (ISTH) recommends measures for advanced/metastatic cancer patients with low bleeding risks (5). These differing viewpoints highlight the necessity for an approach to guide clinical decision making effectively.

In a study conducted by Yi fan Jin et al. Discovered that lung cancer patients with DVT, those, with adenocarcinoma exhibit advanced stages, heightened heart injury and a hypercoagulable state resulting in a poorer prognosis despite anticoagulant treatment (5). Similarly, Mansfield AS and colleagues found that having a high KRS did not show a connection with VTE when compared to an intermediate score. However, it did emerge as a predictor of mortality in cancer patients (15). These results emphasize the need for early detection and intervention in high-risk patients to enhance outcomes.

The case study presented here, where lung adenocarcinoma was mistaken for thromboembolic events, underscores the pivotal role of thorough and prompt diagnostic evaluations in individuals experiencing unexplained thromboembolic symptoms. This case serves as a reminder that malignancies should always be considered in the diagnoses of DVT and PE especially when accompanied by respiratory issues and weight loss. Early recognition and comprehensive treatment involving both therapies and anticoagulation are essential, for better patient outcomes and survival rates (4, 9).

CONCLUSION

This case report underscores the connection between lung cancer, specifically adenocarcinoma and thromboembolic incidents such as Deep Vein Thrombosis (DVT). Individuals with cancer, especially those in advanced stages are at a higher risk of blood clot formation, which can result in lower survival rates despite receiving appropriate anticoagulant treatment. In this case, the discovery of lung cancer only occurred after the patient developed DVT causing a delay in identifying the cancer and contributing to its progression to a stage with a bleak outlook. Hence, it is crucial for patients who present with DVT and respiratory symptoms to receive diagnosis and immediate medical examinations to ensure timely detection and management of potential cancers. This approach aims to enhance outcomes and increase survival rates in the long run.

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