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Pneumothorax During a Family Dinner: A Case Report

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Abstract

Primary spontaneous pneumothorax can be readily identified through careful clinical evaluation. We present the case of a 26-year-old male who developed left-sided chest pain and dyspnea 36 hours before presentation, which occurred during a family dinner. He had a nine-year smoking history and denied any history of trauma. Upon examination by a family physician, who was also a relative of the patient, he was eupneic, pale, and had a facial expression of pain. Pulmonary auscultation revealed nearly absent breath sounds over the left hemithorax, leading to an immediate referral to the emergency department of the reference hospital with suspected pneumothorax. In the emergency department, the patient was evaluated and underwent a chest X-ray, which demonstrated a left tension pneumothorax. A left-sided tube thoracostomy was performed, resulting in immediate evacuation of air. A post-procedure chest X-ray confirmed complete lung re-expansion. The patient was admitted to the pulmonology ward and recovered uneventfully; the chest tube was clamped and subsequently removed, after which the patient was discharged without complications. This case report highlights two key factors: the relatively rare diagnosis of tension pneumothorax and the potential clinical bias that may arise when a physician evaluates a close relative. This situation was further complicated by the fact that the initial evaluation took place outside a healthcare facility. Nevertheless, it ultimately yielded a favorable clinical outcome.

Categories: Family/General Practice, Pulmonology
Keywords: clinical bias, family physician, primary spontaneous pneumothorax, tension pneumothorax, tobacco use

Introduction

Pneumothorax is a clinical entity defined by the presence of gas within the pleural space - the thin, fluid-filled gap between the chest wall and the lungs [1]. Under normal physiological conditions, this space maintains a negative intrapleural pressure that holds the lung expanded against the thoracic cage. When gas enters the space, this negative pressure gradient is lost, causing the underlying lung tissue to recoil and partially or completely collapse [2].

Primary spontaneous pneumothorax (PSP) has been defined as a pneumothorax occurring in the absence of overt or known lung pathology. However, subclinical structural defects, particularly subpleural blebs, are present in most affected individuals and likely increase susceptibility to pleural collapse [1].

Additional predisposing factors include cigarette smoking and host susceptibility driven by genetic markers, such as the human leukocyte antigen (HLA) haplotype A2B40 and mutations in the fibrillin-1 (*FBN1*) and alpha-1 antitrypsin genes. Conversely, inherited systemic diseases - such as autosomal dominant Birt-Hogg-Dubé syndrome, Marfan syndrome, and hyperhomocysteinemia - underlie cases categorized as secondary pneumothorax [1].

PSP occurs more frequently in males, with a reported male-to-female ratio ranging from 3:1 to 6:1. Reported annual incidence figures demonstrate notable geographic divergence, spanning from 7.4 (men) and 1.2 (women) per 100,000 in the United States to 37 (men) and 15.4 (women) per 100,000 in the United Kingdom. To date, the rationale behind these population-level geographic discrepancies is unknown [1].

The primary clinical presentation comprises pleuritic chest pain and dyspnea. Patients with a small pneumothorax (<15% of the hemithorax) frequently present with unremarkable physical examination findings, with sinus tachycardia being the most common sign. In contrast, patients with a large pneumothorax typically exhibit reduced chest wall movement, a hyperresonant percussion note, and decreased or absent breath sounds on the affected side. Tracheal deviation to the contralateral side is generally absent in simple pneumothorax and strongly indicates progression to tension pneumothorax [3].

Tension pneumothorax arises when elevated intrapleural pressure impairs venous return, precipitating hemodynamic collapse characterized by dyspnea, tachycardia, and arterial hypotension. Affecting 1%-2% of pneumothorax cases, it occurs more frequently in ventilated or trauma patients. Because it constitutes a life-threatening, reversible cause of cardiac arrest, prompt diagnosis and emergency decompression are vital [1].

Case Presentation

We present the case of a 26-year-old Caucasian male complaining of severe pain throughout the left hemithorax during a family dinner. The pain had started suddenly 36 hours earlier and was described as a sharp, stabbing sensation (7/10 on the visual analog scale), nonradiating, accompanied by movement limitation and progressively worsening dyspnea that disrupted his sleep the previous night. He denied trauma, cough, or fever. His family perceived the symptoms as intestinal colic. The pain did not respond to 1 g of oral paracetamol.

His personal history includes tobacco smoking starting at age 17, consuming 10 cigarettes/day (4.5 pack-years), and having stopped smoking five days prior to symptom onset. He denied any previous history of cough, dyspnea, chest pain, known recent infections, alcohol or substance abuse, allergies, or recent travel. His immunization status was up to date according to the National Vaccination Program, and he was taking no chronic medications.

His family history includes the following: maternal grandfather, a smoker with dyslipidemia, arterial hypertension, and Parkinson's disease; maternal grandmother with arterial hypertension, dyslipidemia, and glaucoma; and mother, a former smoker with Crohn's disease.

Upon informal examination by his family physician, who was also a relative attending the family gathering, the patient exhibited an ectomorphic biotype and was eupneic and pale, with a facies of pain. Inspection revealed markedly decreased chest wall movement over the left hemithorax. Cardiac auscultation demonstrated rhythmic S1 and S2 sounds, which were slightly muffled. Pulmonary auscultation revealed absent breath sounds in the lower and upper thirds of the left hemithorax and markedly diminished breath sounds in the middle third. Consequently, he was urgently referred to the emergency department with pneumothorax as the leading diagnostic hypothesis.

In the emergency department, the patient was evaluated by a different physician. He was alert, calm, cooperative, oriented, and eupneic but showed signs of left-sided discomfort. Blood pressure was 150/76 mmHg; heart rate was 102 beats per minute (rhythmic); oxygen saturation was 97% on room air; and the skin and mucous membranes were pink and well-hydrated. Thoracic inspection, palpation, and percussion findings were not documented in the available chart. Cardiac auscultation confirmed rhythmic S1 and S2 sounds without murmurs or extra sounds. Pulmonary auscultation demonstrated completely abolished breath sounds on the left side, with no abnormalities on the right side. Abdominal inspection, auscultation, percussion, and palpation were unremarkable.

A chest radiograph was performed and demonstrated complete hyperlucency and an absence of lung markings throughout the left hemithorax, accompanied by a rightward shift of the mediastinum and trachea, consistent with a left-sided tension pneumothorax (Figure *1*). Laboratory evaluation revealed an arterial blood gas analysis with a pO_2 of 62.6 mmHg and an O_2 saturation of 93%, with the remainder of the blood work showing no other abnormalities.

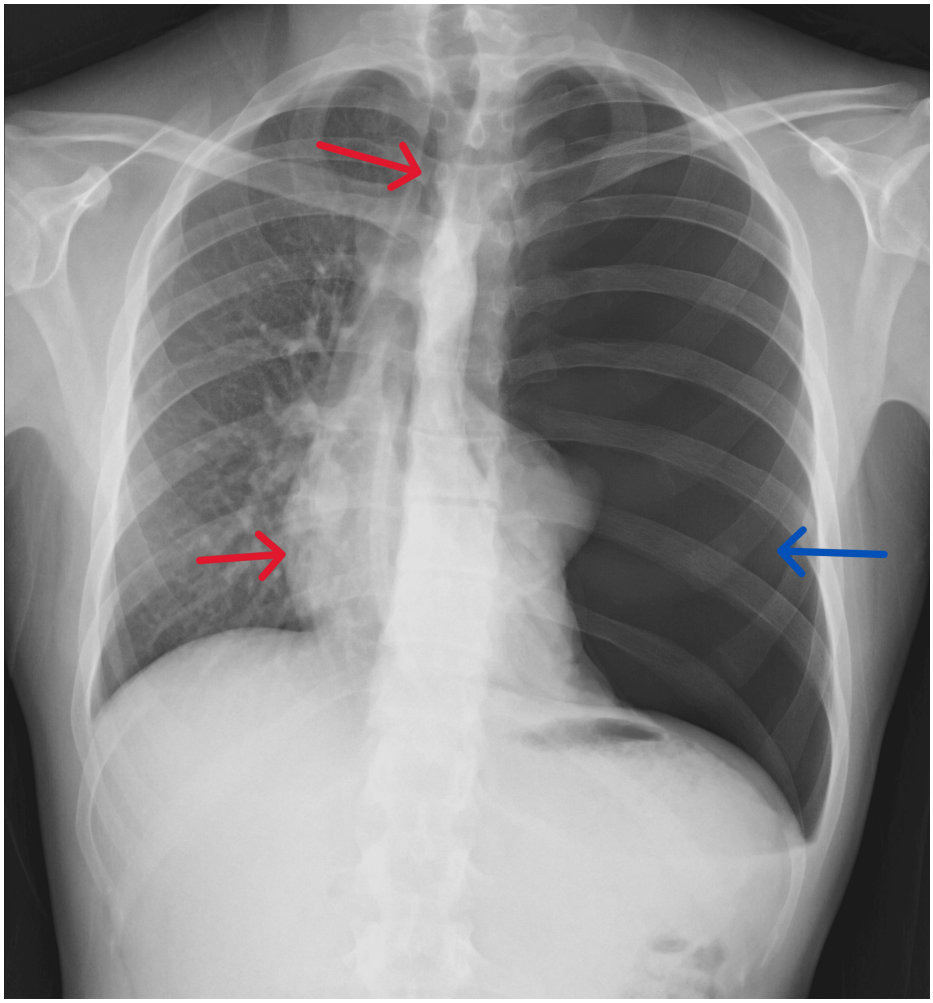

FIGURE 1: Posteroanterior chest radiograph showing complete hyperlucency of the left hemithorax (blue arrow) with a rightward shift of the trachea and mediastinum (red arrows).

A left tube thoracostomy was performed using an 18F chest tube in the fifth intercostal space, resulting in immediate air evacuation, after which the patient reported transient nausea and pain that gradually improved. A post-procedure chest X-ray confirmed complete left lung re-expansion (Figure *2*).

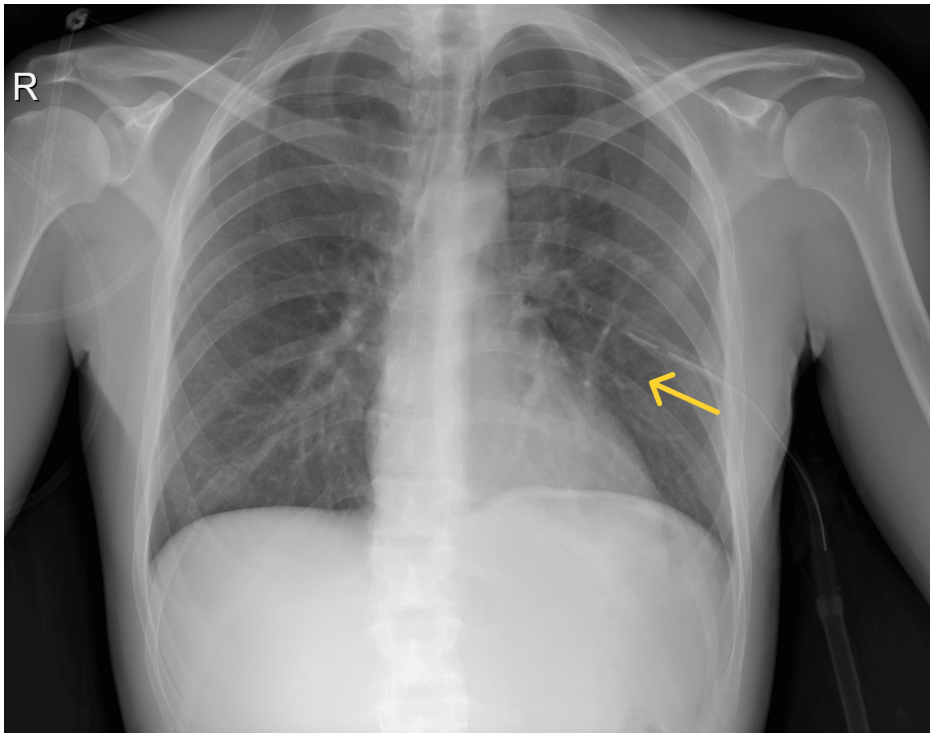

FIGURE 2: Thoracic posteroanterior radiograph showing complete left lung re-expansion (yellow arrow).

Lung markings are observed throughout the entire left hemithorax.

The patient was admitted to the pulmonary ward with the diagnosis of left primary spontaneous tension pneumothorax. The hospital stay was uneventful; the chest drain was clamped on day two and removed on day 3. He was discharged on the same day, prescribed paracetamol 1 g every 8 hours as needed, and instructed to avoid smoking, air travel, and scuba diving for the next six months. He was reevaluated at a pulmonology outpatient consultation on day 30, where a chest CT scan was requested and is currently pending scheduling.

Discussion

This case report illustrates the conjunction of two key factors: an uncommon diagnosis and the clinical bias resulting from evaluating and managing a close relative - a reality more frequent than desirable.

A 26-year-old male smoker presenting with sudden-onset left-sided chest pain and dyspnea strongly points toward pneumothorax as the most likely clinical diagnosis. However, excluding other, albeit less likely, differential diagnoses remains crucial, such as pulmonary embolism, acute myopericarditis, acute myocardial infarction, musculoskeletal pathology, and anxiety - the latter two being diagnoses of exclusion. In the present case, pulmonary auscultation was pivotal, as the family's attribution of the patient's symptoms to a benign cause would have delayed diagnosis, potentially leading to an adverse outcome.

The second factor highlighted in this case report is the close familial relationship between the patient and the healthcare provider. While this factor usually contributes to diagnostic delays and medical error, that was not the case here. Current medical literature demonstrates that evaluating and treating family members compromises objectivity and impartiality in clinical judgment, an aspect frequently driven by unconscious optimism and reduced rigor during clinical evaluation [4,5].

The usual tendency to dismiss symptoms in close relatives or friends reinforces ethical guidelines that advise against providing medical care to family members (except in emergency situations). Emotional proximity and preformed informal diagnoses can mimic and validate the patient's own false causal correlations, thereby compromising patient safety [6,7].

Beigel et al. [8] report both advantages and disadvantages of physicians treating family and friends (PTFF). Benefits reported include convenience, easy access, cost savings, reduced barriers to care, trust, customized treatment, and extra effort from the physician. Physicians are motivated to treat relatives and friends because they believe they can provide better care and protect them from medical errors by other healthcare

providers. The disadvantages of PTFF are confidentiality breaches, poor informed consent, compromised patient autonomy, role conflict, damage to personal relationships, lower-quality care, incomplete or inappropriate physical examination, overly aggressive or inadequate treatments, and legal liability for starting such care. The main objection to PTFF is loss of clinical objectivity in practice. Beigel et al. [8] also list three conditions that are widely recognized as legitimate grounds for PTFF: emergency situations, scenarios where no other qualified healthcare provider is available, and short-term management of minor health problems.

In the informal setting of a family dinner, the absence of a complete physical examination could have led to attributing the patient's symptoms to self-reported cramps or another mild condition, delaying clinical diagnosis and compromising patient care. Nevertheless, his general clinical status and the prompt cardiopulmonary auscultation raised the clinical suspicion of pneumothorax, prompting urgent referral to a hospital emergency department, where he was evaluated and managed, ultimately achieving a favorable clinical outcome.

Conclusions

This case report highlights two critical clinical considerations: the prompt recognition of a life-threatening tension pneumothorax and the risk of diagnostic bias when evaluating a close relative. Although established guidelines discourage physicians from treating family members outside of emergencies or minor acute issues, an immediate informal assessment using the only available tool - a stethoscope - prevented a potentially fatal oversight in an extra-hospital setting. Ultimately, early physical examination overcame these diagnostic and environmental challenges, resulting in a favorable outcome.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Teresa T. Costa

Acquisition, analysis, or interpretation of data: Teresa T. Costa

Drafting of the manuscript: Teresa T. Costa

Critical review of the manuscript for important intellectual content: Teresa T. Costa

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. N/A issued approval N/A. Written informed consent was obtained from the patient (who is a family member of the author) for the publication of this case report and any accompanying images. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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