Diagnostic Reevaluation of Persistent Asthma Reveals Underlying Pulmonary Carcinoid Tumor: A Case Report

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Abstract

Background: A 50-year-old female patient with severe uncontrolled asthma was presented to our hospital for evaluation of anti-IgE therapy. Despite being on a comprehensive asthma management plan, including budesonide-formoterol combination, montelukast, and oral steroids, her symptoms of persistent dyspnea and wheezing continued unabated following a severe asthma attack five months prior. The case emphasizes the importance of reevaluating uncontrolled asthma to exclude other underlying conditions. Methods: The patient underwent a series of diagnostic evaluations, including chest X-ray, computed tomography (CT), and fiberoptic bronchoscopy. Imaging revealed a left-sided hilar opacity and an endobronchial lesion obstructing the left lower bronchus. The lesion was further assessed via CT, leading to a shift in diagnosis. The patient subsequently underwent a left lower lobe lobectomy and mediastinal lymph node dissection. Results: Pathological examination confirmed the diagnosis of a typical carcinoid tumor. Postoperatively, the patient's symptoms subsided, and she experienced no recurrence. Follow-up assessments indicated improved pulmonary function, and her asthma

Significance This case showed the necessity of thorough diagnostic reevaluation in persistent asthma to uncover potential alternative diagnoses like carcinoid tumors.

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became well-controlled without the need for further aggressive treatment. Conclusion: This case highlights the need for a thorough evaluation in patients with severe, uncontrolled asthma, particularly when symptoms persist despite aggressive management. Clinicians should consider alternative diagnoses, such as carcinoid tumors, to ensure accurate diagnosis and effective treatment. Early detection and appropriate intervention are crucial in improving outcomes for patients with similar presentations.

Keywords: Uncontrolled asthma, Carcinoid tumor, Diagnostic evaluation, Pulmonary function, Asthma management.

Introduction

Asthma is a common chronic respiratory condition, but a small percentage of patients—approximately 10% to 15%—experience severe asthma that remains uncontrolled despite standard treatment protocols (Chanez et al., 2007; Chung et al., 2014; Reddel & Taylor, 2017). These patients require a thorough evaluation to exclude other underlying conditions that may contribute to their persistent symptoms (Hekking & Wener, 2015; McCracken et al., 2017). In this case, we present a 50-year-old female with a long-standing history of asthma, who was referred to our hospital for anti-IgE therapy due to her severe, uncontrolled symptoms (Humbert et al., 2014). Despite being on a comprehensive asthma management plan, including budesonide-formoterol combination

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therapy, montelukast, and oral steroids, she continued to experience persistent dyspnea and wheezing following a severe asthma attack five months prior (Masoli et al., 2004; National Asthma Education and Prevention Program [NAEPP], 2020). Her clinical evaluation revealed a left-sided hilar opacity on chest X-ray, prompting further investigation (Castro et al., 2018). Subsequent imaging and fiberoptic bronchoscopy identified an obstructive endobronchial lesion in the left lower bronchus, which was confirmed as a typical carcinoid tumor following surgical resection (Saito & Kikuchi, 2016). This case underscores the importance of considering alternative diagnoses in patients with refractory asthma, particularly when symptoms persist despite aggressive management (Wenzel, 2012). Identifying and treating the underlying cause, as in this case of a coexisting carcinoid tumor, is crucial for effective symptom resolution and long-term patient outcomes (Durrington et al., 2014; Kudo et al., 2013; Lambrecht et al., 2019; Martinez, 2013).

Case Report Presentation

A 48-year-old woman presented to our hospital with complaints of persistent dyspnea and wheezing. She had a known history of asthma for 12 years, which had been well controlled with a combination therapy of budesonide at 160 μ g and formoterol at 4.5 μ g, taken twice daily. However, five months prior to her admission, she experienced a severe asthma attack that led to persistent wheezing. Despite escalated treatment with a higher dose of budesonide (320 μ g) and formoterol (9 μ g) in addition to oral steroids (prednisolone 30–40 mg/day) and montelukast (10 mg/day), her symptoms remained uncontrolled. Due to the failure of these interventions, she was referred to our hospital for further evaluation, including the consideration of anti-IgE therapy. The patient's medical history also included Hashimoto's thyroiditis, for which she was on thyroid hormone replacement therapy, and osteoporosis, managed with calcium supplementation.

Clinical Examination and Investigations

On physical examination, the patient's vital signs were stable: pulse rate 86 bpm, temperature 36.5°C, blood pressure 120/70 mmHg, and respiratory rate 18 breaths per minute. Auscultation revealed decreased breath sounds in the left lung, but the remainder of the examination was unremarkable.

Laboratory investigations, including a complete blood count (CBC), were within normal limits. Spirometry demonstrated an obstructive pattern with a forced expiratory volume in 1 second (FEV1) of 82%, forced vital capacity (FVC) of 110%, and an FEV1/FVC ratio of 60%. Although spirometric reversibility was not observed during this admission, a previous test had shown reversible airway obstruction (pre-bronchodilator FEV1 of 64%, post-bronchodilator FEV1 of 75%, with a 17% reversibility). A skin-prick test was positive for house-dust mites, and the total IgE level

was 115 kU/L, suggesting that the patient could be a candidate for anti-IgE therapy.

Chest X-ray revealed a left-sided hilar opacity, prompting further evaluation with computed tomography (CT), which identified a 15mm nodular lesion in the left lower lobe bronchus. This finding led to a shift in the diagnosis from uncontrolled asthma to a possible chest mass. Fiberoptic bronchoscopy confirmed the presence of an endobronchial lesion obstructing the lumen of the left lower bronchus. Due to the lesion's high vascularity, a biopsy was not performed; instead, bronchial lavage was conducted, but cytological analysis of the lavage fluid was normal.

Diagnosis and Management

The patient underwent a left lower lobectomy with mediastinal dissection. Histopathological examination of the resected tissue revealed a typical carcinoid (TC) tumor, with focal invasion of the lung parenchyma through the bronchial wall. Immunohistochemical staining was positive for pancytokeratin, CD56, chromogranin A, and synaptophysin, confirming the diagnosis.

Post-surgery, the patient was asymptomatic and continued on the combination therapy of budesonide at 160 μ g and formoterol at 4.5 μ g. Follow-up spirometry showed improved pulmonary function (FEV1 95%, FVC 138%, FEV1/FVC 59%). She has remained recurrence-free for two years, and her asthma is currently well-controlled.

Discussion

This case underscores the importance of thorough evaluation in patients with asthma who do not respond to standard treatment protocols. Pulmonary carcinoid tumors, though rare, can mimic asthma, leading to diagnostic challenges and potential delays in appropriate management. In this case, the persistence of asthma symptoms despite aggressive treatment led to the discovery of a carcinoid tumor, highlighting the need for clinicians to consider alternative diagnoses in refractory asthma cases.

The literature indicates that carcinoid tumors may present with symptoms overlapping with those of asthma, including wheezing, cough, and dyspnea (Dipaolo & Stull, 1993). Atypical features, such as hemoptysis or localized respiratory symptoms, should raise suspicion for a potential malignancy (Hurt et al., 1984; Marty et al., 1995). Furthermore, the presence of elevated IgE levels, as seen in our patient, necessitates a careful approach to differentiate between true asthma and other comorbid conditions (Schrevens et al., 2004).

Conclusion

In conclusion, this case demonstrated the critical role of comprehensive diagnostic workups in patients with uncontrolled asthma, particularly when standard treatments fail. Clinicians should remain vigilant for potential comorbidities, including carcinoid tumors, to ensure timely and effective management.

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Author contributions

Y.R., J.S., S.K., and M.K.P.R. collaborated in discussing the results, each contributing their expertise. All authors actively participated in reviewing, editing, and finalizing the manuscript.

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Competing financial interests

The authors have no conflict of interest.

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