SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Pulmonology

Spontaneous Pneumomediastinum Complicating Acute Asthma: A Case Report

Ghita Baani[1]*, Salma Abrar[1], Hanane Ikrou[1], Oussama Halloumi[1]

[1]Pulmonology Department, Mohamed VI University Hospital, Faculty of Medicine and Pharmacy of Agadir, Ibn Zohr University, Agadir, Morocco

DOI: https://doi.org/10.36347/sasjm.2026.v12i09.020 | **Received:** 18.07.2026 | **Accepted:** 12.09.2026 | **Published:** 17.09.2026

***Corresponding author:** Ghita Baani
Pulmonology Department, Mohamed VI University Hospital, Faculty of Medicine and Pharmacy of Agadir, Ibn Zohr University, Agadir, Morocco

Abstract **Case Report**

Spontaneous pneumomediastinum (SPM) is an uncommon condition characterized by the presence of free air within the mediastinum in the absence of trauma, surgery, or other iatrogenic causes. Although generally benign and self-limiting, it may complicate acute asthma and can present with extensive subcutaneous emphysema. We report the case of a 19-year-old man with recently diagnosed asthma who developed extensive spontaneous pneumomediastinum during an acute exacerbation triggered by a probable viral respiratory infection. The patient had discontinued his inhaled corticosteroid/long-acting beta-agonist treatment two months before admission. He presented with progressive dyspnea, dry cough, low-volume hemoptysis, and extensive subcutaneous emphysema involving the neck, trunk, back, and upper limbs. Chest radiography demonstrated pneumomediastinum and extensive subcutaneous emphysema without pneumothorax. Thoracic computed tomography confirmed extensive mediastinal and subcutaneous air and excluded tracheal or esophageal rupture. Bronchoscopy showed no tracheobronchial abnormality. The patient was managed conservatively with oxygen, nebulized bronchodilators, systemic corticosteroids, and close clinical monitoring. Thoracic surgery was consulted because of the extent of the pneumomediastinum and the potential risk of airway compression. The patient improved progressively and was discharged on the sixth hospital day. This case highlights the importance of considering SPM in patients with acute asthma who develop atypical respiratory or subcutaneous findings. Early recognition and appropriate imaging can establish the diagnosis and help exclude potentially life-threatening secondary causes.

Keywords: Spontaneous Pneumomediastinum, Asthma, Acute Asthma Exacerbation, Subcutaneous Emphysema, Pneumomediastinum.

INTRODUCTION

Spontaneous pneumomediastinum (SPM), also known as spontaneous mediastinal emphysema, is defined as the presence of free air within the mediastinum without preceding trauma, surgery, or an identifiable iatrogenic cause. It is an uncommon condition that predominantly affects young individuals, particularly males, and is usually self-limiting [1, 2]. Asthma is a recognized predisposing condition, particularly when an acute exacerbation is associated with vigorous coughing, wheezing, or increased intrathoracic pressure [1-3].

The pathophysiological mechanism is commonly explained by the Macklin effect, in which increased intra-alveolar pressure causes alveolar rupture followed by dissection of air along the bronchovascular sheaths toward the mediastinum [2]. Although the prognosis is generally favorable, SPM may occasionally be associated with pneumothorax, extensive subcutaneous emphysema, or airway compression. We report a case of extensive SPM complicating an acute asthma exacerbation in a young adult.

CASE REPORT

A 19-year-old male student, with no history of smoking or other toxic habits, was admitted to our pulmonology department for an acute asthma exacerbation complicated by extensive subcutaneous emphysema and pneumomediastinum. He had been diagnosed with asthma five months earlier and had been treated with inhaled corticosteroids and a long-acting β2-agonist for three months. However, he had discontinued his treatment two months before admission. He was also

followed for allergic rhinitis treated with antihistamines and intranasal corticosteroids. There was no previous history of tuberculosis, thoracic trauma, or recent invasive procedure.

Seven days before admission, he developed flu-like symptoms after exposure to cold weather, followed by progressive dyspnea, dry cough, and low-volume hemoptysis. On the day of admission, he presented with grade 3 dyspnea according to the Sadoul scale and extensive swelling involving the neck, trunk, back, and upper limbs. He denied chest pain, odynophagia, or dysphagia.

On examination, the patient was conscious and tachycardic and required oxygen supplementation at 2 L/min through nasal cannula. Extensive subcutaneous emphysema was palpable over the neck, trunk, back, and upper limbs. Chest auscultation revealed diffuse bilateral expiratory wheezing and left-sided rhonchi. Hamman's sign was absent. The remainder of the physical examination was unremarkable.

Chest radiography revealed extensive pneumomediastinum and subcutaneous emphysema without associated pneumothorax (Figure 1).

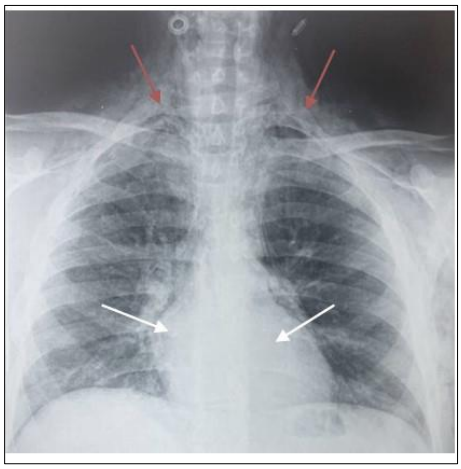

Figure 1: Chest X-ray of the patient revealing subcutaneous emphysema (Red arrows), and pneumomediastinum (White arrows)

Thoracic computed tomography confirmed extensive mediastinal air surrounding the mediastinal structures, associated with marked subcutaneous and intramuscular emphysema extending from the cervical region to the abdomen (Figures 2 and 3).

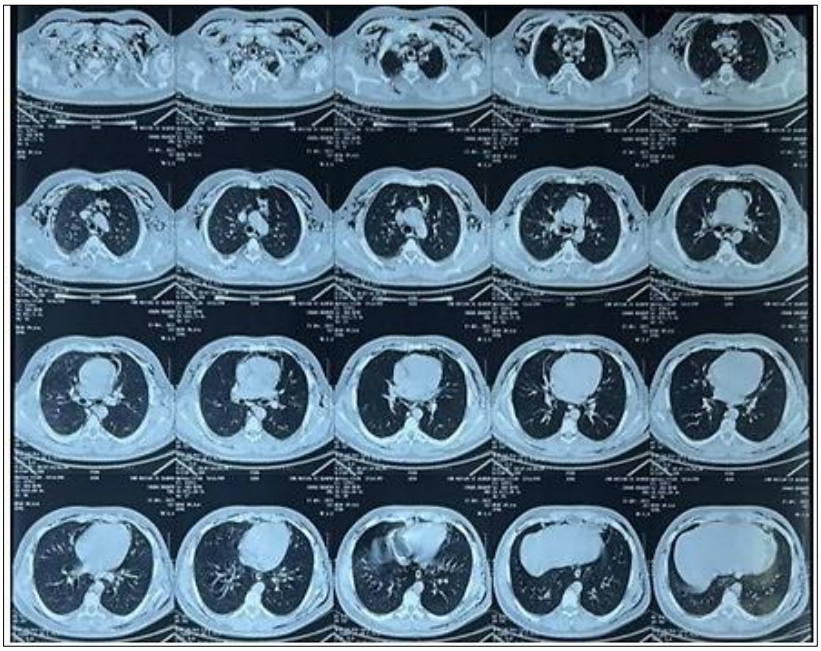

Figure 2: Chest CT showing the presence of interstitial air surrounding the mediastinal structures, important subcutaneous emphysema

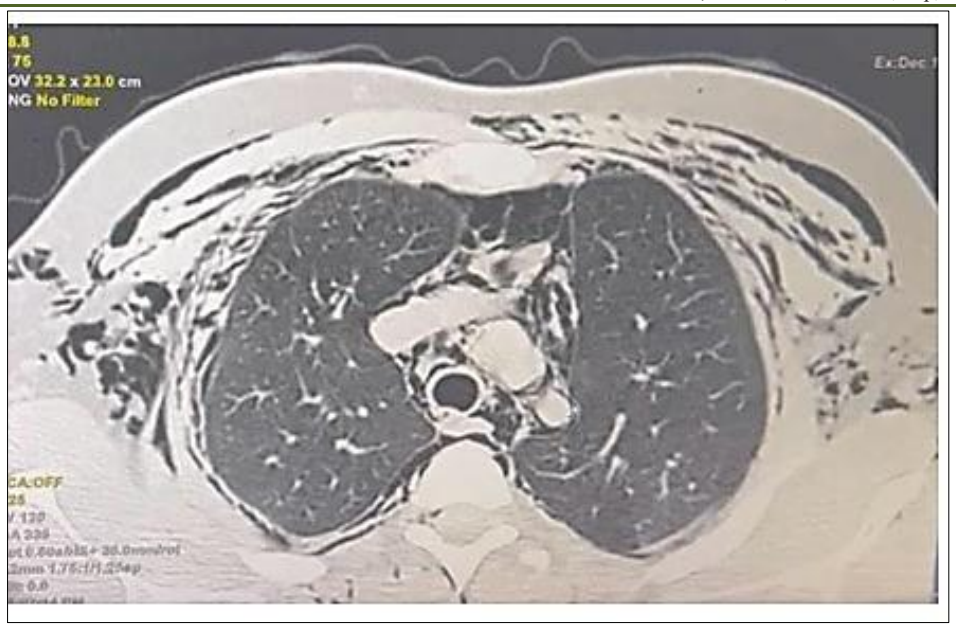

Figure 3: Axial computed tomography of the chest showing extensive pneumomediastinum

No tracheal fistula or esophageal rupture was identified. A bronchoscopy performed subsequently showed no abnormality of the tracheobronchial tree.

The patient was treated according to the hospital protocol for acute asthma exacerbation with nebulized bronchodilators, oxygen therapy, and systemic hydrocortisone. The pneumomediastinum was managed conservatively with close clinical and radiological monitoring. Thoracic surgeons were consulted because of the extent of the mediastinal air and the potential risk of airway compression. No invasive decompression was required because the patient remained clinically stable and progressively improved.

The patient's respiratory symptoms and subcutaneous emphysema gradually resolved. He was discharged on the sixth hospital day in clinically stable condition with close outpatient follow-up and continuation of controller asthma therapy.

DISCUSSION

SPM is a rare but well-recognized complication of acute asthma. In a series of 13 patients with SPM, asthma exacerbation was the most frequent precipitating factor, supporting the association between acute increases in intrathoracic pressure and mediastinal air leakage [4]. Another series of 18 patients reported that coughing was the most common precipitating factor, while dyspnea and chest pain were the predominant symptoms [2].

The underlying mechanism is explained by the Macklin effect. During severe coughing or bronchospasm, increased intra-alveolar pressure can result in alveolar rupture. Escaped air then travels through the pulmonary interstitium along the bronchovascular bundles and reaches the mediastinum [2-4]. This mechanism provides a plausible explanation for the extensive pneumomediastinum observed in our patient during an acute asthma exacerbation.

Clinically, chest pain and dyspnea are frequent manifestations, while subcutaneous emphysema may provide an important diagnostic clue [2-4]. Our patient presented predominantly with dyspnea and extensive subcutaneous emphysema without chest pain or Hamman's sign, demonstrating the variable clinical presentation of SPM.

Chest radiography can establish the diagnosis in many patients, whereas computed tomography is more sensitive and can define the extent of mediastinal and subcutaneous air while helping identify associated complications or alternative causes [2, 3]. In our patient, CT was particularly useful because of the extensive subcutaneous emphysema and allowed exclusion of important secondary causes such as esophageal or tracheobronchial rupture.

The management of uncomplicated SPM is generally conservative. Treatment should focus on the underlying precipitating condition, with oxygen therapy, symptomatic treatment, and clinical observation when appropriate [1-3]. Invasive procedures are rarely required and should be considered when complications such as significant airway compression, tension pneumomediastinum, or hemodynamic instability develop [1]. In our patient, conservative management combined with treatment of the asthma exacerbation resulted in complete clinical improvement.

This case emphasizes that SPM should be considered when a patient with acute asthma develops sudden respiratory deterioration or unexplained

subcutaneous emphysema. Prompt imaging is important not only to confirm the diagnosis but also to exclude potentially life-threatening secondary causes.

CONCLUSION

Spontaneous pneumomediastinum is an uncommon complication of acute asthma that may present with extensive subcutaneous emphysema and respiratory distress. A high index of suspicion is required when atypical clinical findings occur during an asthma exacerbation. Chest radiography and, when necessary, thoracic CT can establish the diagnosis and exclude serious secondary causes. Most patients can be successfully managed conservatively with treatment of the underlying asthma exacerbation and close monitoring.

Acknowledgement

The authors thank the medical and paramedical staff of the Pulmonology Department of Mohamed VI University Hospital, for their contribution to the patient's care.

Declaration of Interests: The authors declare that they have no conflicts of interest related to this case report.

Patient Consent: Written informed consent for publication of the case and the accompanying radiological images was obtained from the patient.

REFERENCES

1. Covantev, S., Mazuruc, N., Uzdenov, R., & Corlateanu, A. (2019). Spontaneous pneumomediastinum – A rare asthma complication. *Folia Medica, 61*(3), 472–477. https://doi.org/10.3897/folmed.61.e39419
2. Dionísio, P. A. V., Martins, L., Moreira, S., Manique, A., Macedo, R., Caeiro, F., Boal, L., & Bárbara, C. (2017). Spontaneous pneumomediastinum: Experience in 18 patients during the last 12 years. *Jornal Brasileiro de Pneumologia, 43*(2), 101–105. https://doi.org/10.1590/S1806-37562016000000052
3. Gleeson, M., McEnery, T., & Gaine, S. (2024). Pneumomediastinum complicating acute asthma. *QJM: An International Journal of Medicine, 117*(3), 229–230. https://doi.org/10.1093/qjmed/hcad263
4. Migaou, A., Fahem, N., Ben Saad, A., Joobeur, S., Cheikh Mhammed, S., & Rouatbi, N. (2019). Spontaneous pneumomediastinum: Experience in 13 patients. *Respiratory Medicine Case Reports, 28*, 100946. https://doi.org/10.1016/j.rmcr.2019.100946
5. Farouji, A., Haddad, A. W., Battah, A., Ahmad, A. S., & Miller, R. (2023). A 27-year-old woman with an exacerbation of chronic asthma due to influenza A presenting with pneumomediastinum, retropharyngeal emphysema, and subcutaneous emphysema. *American Journal of Case Reports, 24*, e941733. https://doi.org/10.12659/AJCR.941733.