

SUBCUTANEUS EMPHYSEMA– A VERY RARE ASTHMA COMPLICATION

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ABSTRACT

Background:

Asthma is a chronic inflammatory disease that causes partially or completely reversible airway obstruction¹. Common asthma complications include severe asthma and severe hypoxemia. Pneumomediastinum and subcutaneous emphysema represent rare complications of acute asthma exacerbation. The incidence of pneumomediastinum is approximately 1:44,000, with 70% presenting with subcutaneous emphysema. The underlying mechanism is characterized by alveolar rupture due to a sudden increase in intrathoracic pressure. Although typically self-limiting, delayed recognition may lead to potentially serious outcomes□.

Case Presentation:

We report a female who presented with shortness of breath for two days prior to admission, accompanied by productive cough with yellow sputum and fever. The patient further experienced (don't repeat "accompanied by") swelling of the neck extending to the chest, along with pain and wheezing during breathing. The patient had a history of asthma with almost daily exacerbations and chronic electronic cigarette use. Examination showed neck-to-chest swelling with crepitus and bilateral wheezing. Radiography confirmed that she had pneumonia, pneumomediastinum, and subcutaneous emphysema. She was treated with antibiotics, bronchodilators, and supportive therapy, and improved within five days.

Conclusion:

Subcutaneous emphysema is a rare complication of acute asthma exacerbation. Although generally self-limiting, rapid diagnosis through clinical and radiological evaluation can prevent more severe complications. Conservative treatment provides good outcomes when performed promptly and appropriately.

Keywords: asthma, pneumomediastinum, subcutaneous emphysema

ABSTRAK

Latar Belakang:

Asma adalah penyakit inflamasi kronis yang menyebabkan obstruksi saluran napas yang sebagian atau sepenuhnya reversibel¹. Komplikasi asma yang umum meliputi asma berat dan hipoksemia berat. Pneumomediastinum dan emfisema subkutan merupakan komplikasi langka dari eksaserbasi asma akut. Insidensi pneumomediastinum sekitar 1:44.000, dengan 70% kasus disertai emfisema subkutan. Mekanisme dasarnya ditandai dengan ruptur alveolar akibat peningkatan tekanan intratoraks secara tiba-tiba. Meskipun umumnya bersifat self-limiting, penundaan diagnosis dapat menyebabkan hasil yang berpotensi serius□.

Presentasi Kasus:

Kami melaporkan seorang wanita yang datang dengan sesak napas selama dua hari sebelum dirawat, disertai batuk produktif dengan dahak kuning dan demam. Pasien juga mengalami pembengkakan leher yang menjalar ke dada, disertai nyeri dan bunyi mengi saat bernapas. Pasien memiliki riwayat asma dengan eksaserbasi hampir setiap hari dan penggunaan rokok elektronik kronis. Pemeriksaan menunjukkan pembengkakan leher ke dada dengan crepitus dan wheezing bilateral. Rontgen mengonfirmasi bahwa ia menderita pneumonia, pneumomediastinum, dan

emfisema subkutan. Ia diobati dengan antibiotik, bronkodilator, dan terapi pendukung, dan membaik dalam lima hari.

Kesimpulan:

Emfisema subkutan adalah komplikasi langka dari eksaserbasi asma akut. Meskipun umumnya bersifat self-limiting, diagnosis cepat melalui evaluasi klinis dan radiologis dapat mencegah komplikasi yang lebih parah. Pengobatan konservatif memberikan hasil yang baik jika dilakukan dengan cepat dan tepat.

Kata kunci: asma, pneumomediastinum, emfisema subkutan

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Introduction

Asthma is a chronic inflammatory disease that causes partially or completely reversible airway obstruction¹. Common asthma complications include severe asthma and severe hypoxemia, but rare complications such as pneumomediastinum, which might lead to spontaneous subcutaneous emphysema, may also occur^{2,3}.

The incidence of pneumomediastinum is approximately 1:44,000, with 70% presenting with subcutaneous emphysema. The underlying mechanism is known as the Macklin effect, characterized by alveolar rupture due to a sudden increase in intrathoracic pressure, followed by dissection of air through the bronchovascular sheaths into the mediastinum. Although generally self-limiting, early diagnosis is important to prevent more severe complications⁴.

Case Description

A woman presented with shortness of breath for two days prior to admission, accompanied by productive cough with yellow sputum and fever. The patient further experienced (don't repeat "accompanied by") swelling of the neck extending to the chest, along with pain and wheezing when breathing. The patient had a history of asthma with almost daily exacerbations. She had never sought regular medical care and frequently used salbutamol-theophylline to relieve her symptoms. She had never used nebulizer medications or inhalers before, and had been using electronic cigarettes for the past five years.

Physical examination revealed a room-air oxygen saturation of 90%. Auscultation revealed wheezing and rhonchi in both lung fields. Neck examination showed edema extending from the neck to the chest, accompanied by tenderness and crepitus. Laboratory testing showed a leukocyte count of 12,450 cells/ μ L. Chest radiography showed bilateral bronchopneumonia and radiolucent air density

in the right neck, which extended to the mid-right lateral hemithorax.

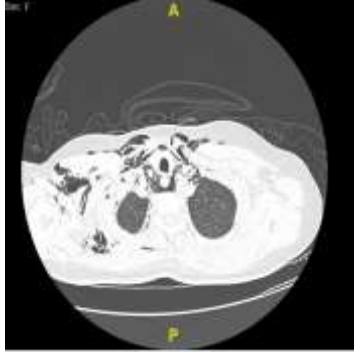
The patient was diagnosed with pneumonia, acute asthma exacerbation with pneumomediastinum, and subcutaneous emphysema. She received ceftriaxone, azithromycin, N-acetylcysteine, and paracetamol, as well as nebulized ipratropium bromide, salbutamol, and budesonide every 8 hours. She was discharged after 5 days of hospitalization with a budesonide-formoterol inhaler, and her clinical condition remained stable thereafter.



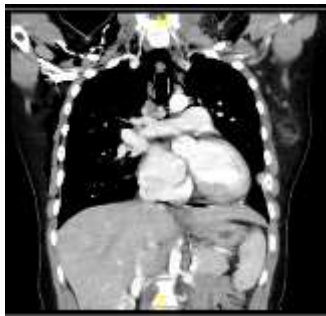
Picture 1. Patient Chest X Ray



Picture 2. Patient Chest X Ray 5 Days After Therapy



Picture 3. Patient Chest CT Scan



Picture 4. Patient Chest CT Scan



Picture 5. Clinical findings indicate subcutaneous emphysema in the patient

Discussion

Pneumomediastinum leading to subcutaneous emphysema is a rare complication of asthma exacerbation. High intrathoracic pressure due to airway obstruction causes alveolar rupture, allowing air to enter the mediastinum⁴.

Typical symptoms include chest pain, dyspnea, neck swelling, and subcutaneous crepitus of the neck or chest. Hamman's sign—a crunching sound synchronous with the heartbeat—may serve as a diagnostic clue².

Diagnosis is primarily established through chest radiography, while thoracic CT provides more sensitive confirmation and helps distinguish spontaneous pneumomediastinum from secondary causes, such as esophageal perforation or thoracic trauma².

Most cases are mild and can be treated conservatively with oxygen therapy, analgesics, and asthma control. Oxygen accelerates the reabsorption of mediastinal air by increasing the nitrogen diffusion gradient. Surgical intervention such as mediastinotomy is reserved for cases of tension pneumomediastinum or ventilatory failure². Close monitoring of respiratory status and control of asthma-triggering factors are essential for successful management⁴.

Conclusion

Spontaneous pneumomediastinum is a rare but important complication of asthma attacks. Although generally self-limiting, rapid diagnosis through clinical and radiological evaluation can prevent more severe complications. Conservative treatment provides good outcomes when performed promptly and appropriately.

Keywords: Asthma, pneumomediastinum, subcutaneous emphysema

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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