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Spontaneous Pneumomediastinum in an Asthmatic: A Rare Entity

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Abstract **Case Report**

Spontaneous pneumomediastinum is a rare pathology. It occurs mainly in young adults. Its abrupt onset is characteristic, with chest pain, subcutaneous emphysema and dyspnoea. We report a case of pneumomediastinum in a 25-year-old patient with asthma triggered by coughing. The patient presented with acute respiratory failure and retrosternal chest pain. The chest X-ray showed a pneumo-mediastinum with emphysema of the cervical and thoracic soft tissues. A CT scan confirmed the diagnosis of medium-intensity pneumomediastinum with minimal pneumothorax. The outcome was favourable in 4 days after exsufflation, oxygen therapy and conventional medical treatment.

Keywords: Pneumomediastinum, pneumopericardium, pneumothorax, asthma, dyspnea.

INTRODUCTION

Spontaneous pneumomediastinum is defined as the presence of air in the mediastinum in the absence of trauma, iatrogenic injury or underlying lung disease. It is a rare condition with an estimated incidence of 1/32896 in the general population [1]. We report a case of spontaneous pneumomediastinum in an asthmatic patient.

PATIENT AND OBSERVATION

A 24-year-old patient with known asthma was admitted to emergency with acute respiratory failure. The history of the disease dates back four days to the sudden onset of polypnoea associated with retrosternal chest pain one morning after coughing.

On clinical examination, the patient was polypnoeic at 35 cycles per minute, with thoracoabdominal rocking and supra-sternal and sub-costal tugging. Pulmonary auscultation revealed sibilant rales, as well as crackling rales projecting onto the cardiac area (Hamman's sign). Basicervical and anterosuperior thoracic crepitations indicate the presence of subcutaneous emphysema. Blood pressure is 130/70 mmHg. Heart sounds were normal at 110 beats per minute. Oxygen saturation was 85% on room air, and arterial blood gas showed hypoxaemia of 80 mmHg. The chest X-ray (Figure 1) showed fine linear hyperclarity silhouetting the aortic button, descending aorta, heart and laterotrachea. The pneumomediastinum also extended into the cervical region and the cervicothoracic soft tissue. The thoracic CT scan confirmed the presence of medium to large pneumomediastinum visible in all compartments and on all three floors, with extensive intracanal pneumopericardium associated with a bilateral pneumothorax (Figure 2).

The electrocardiogram was normal and the blood count showed a 5% eosinophilia. The patient was placed on a 5 l/min oxygen mask, nebulised ventolin and intravenous corticosteroid therapy with 80 mg methyl prednisolone every 8 hours. Progression in the intensive care unit was favourable after exsufflation.

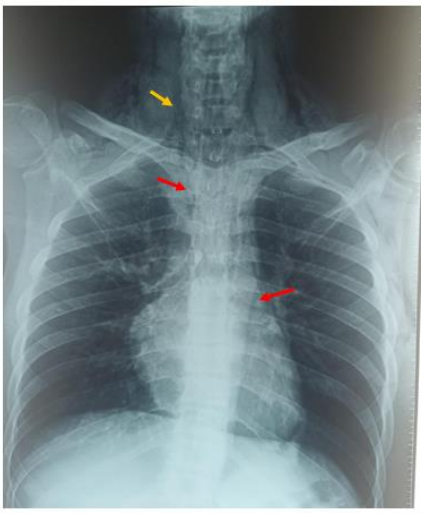

Figure 1: Front chest X-ray: showing pneumomediastinum (red arrow) with cervicothoracic soft tissue emphysema (yellow arrow)

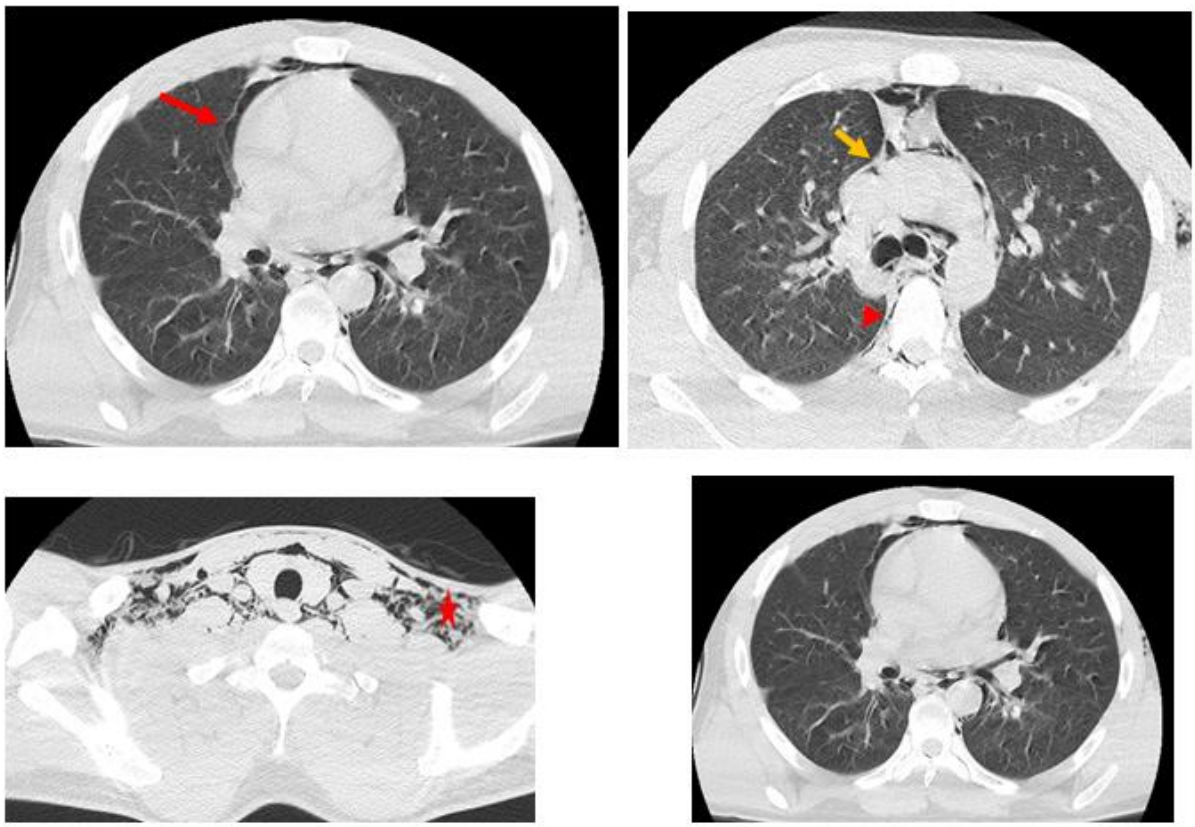

Figure 2: Chest CT scan with parenchymal window: Pneumo mediastinum of great abundance (yellow arrow) with pneumopericardium (red arrow); Bilateral pneumothorax (red arrowhead); Significant subcutaneous cervicothoracic soft tissue emphysema (star)

DISCUSSION

In 1618, the first case of spontaneous pneumomediastinum was reported by Gordon, when Louise Bourgeois observed subcutaneous emphysema in a parturient [1]. It was subsequently described by Hamman in 1939 [2]. Spontaneous pneumomediastinum, which usually appears abruptly, is most commonly seen in young, male adults with a slender build [3-5]. Its pathophysiology involves emphysema due to the creation of a pressure gradient during hyperpressure phenomena in the alveoli close to the vascular septa at the periphery of the lobules (macklin effect) [4, 5]. Their rupture causes interstitial emphysema which travels along the septa, reaching the mediastinum via the hilum and/or the triangular ligament and then the cervical subcutaneous, pericardial or retroperitoneal spaces.

Triggering factors include Valsalva manoeuvres, coughing, labour during parturition, vomiting, an asthma attack, physical exercise, cocaine inhalation, chemotherapy (bleomycin) and diabetic ketoacidosis [1, 6, 7]. In our case, the exacerbation of the asthma attack and the coughing effort were incriminated in the occurrence of pneumomediastinum in our patient. Pain is the main symptom. It often feels like a stab wound, increasing with breathing and radiating towards the neck. It may be accompanied by dyspnoea, a change in voice secondary to pharyngeal irritation, accompanied by coughing and dysphagia. Clinical examination may reveal snowy crepitus [8], indicating subcutaneous emphysema, and Hamman's sign [9], defined by the presence of crackles synchronous with heart sounds on cardiac auscultation.

Although rare, the complications of this condition are pneumothorax and tension pneumomediastinum. Pneumothorax may itself be complicated by tension and be bilateral. Tensioned pneumomediastinum will firstly reduce venous return, with the possibility of defusing the cardiac pump and heart failure (gas tamponade). Uncomplicated spontaneous pneumomediastinum is usually benign. Treatment consists of rest, oxygen therapy and analgesics. Clinical monitoring and cardio-respiratory monitoring are often necessary for a few days before the patient is discharged by chest X-ray or CT scan. Tensioned pneumomediastinum must be drained. Drainage is achieved either by inserting a catheter into the suprasternal fossa [10], or by a small mediastinostomy.

CONCLUSION

Spontaneous pneumomediastinum is a very rare and benign entity. It should be considered as part of the differential diagnosis of sudden chest pain in asthmatic adolescents or young adults, and chest X-rays should be taken if there is the slightest clinical doubt.

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