

# A diagnostic challenge of an unusual presentation of pneumomediastinum

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**【Abstract】** A 77-year-old man who had underwent orthopedic surgery 17 days ago due to his left femur fracture caused by a pedestrian-car accident came to our emergency department with the chief complaint of a 2 days history of sore throat and cough and also swelling of eyelids. He had no respiratory distress or any other life-threatening symptoms. Subsequent physical examination revealed remarkable edema and crepitus over the whole face, neck, proximal upper limbs and the anterior and posterior chest regions, and also bilateral hyperresonance was detected in pulmonary auscultation. The imaging studies showed pneu-

The presence of massive and life-threatening subcutaneous emphysema and pneumomediastinum several days after multiple injuries is a rare condition which needs immediate diagnosis and intervention. Management of these patients especially when they do not have serious complaints is not easy.

We present a 77 years old patient with pneumomediastinum, pneumothorax and subcutaneous emphysema after multiple injuries in order to sensitize the clinicians and raise an awareness of such clinical features among doctors dealing with such conditions in emergency departments.

## CASE REPORT

Our case was a 77 years old male who arrived at the emergency department with a 2-day history of a progressive sore throat and a sense of discomfort in his pharynx and a mild hoarseness of voice which led

momediastinum and bilateral subcutaneous emphysema. The diagnosis of pneumomediastinum and mild left pneumothorax and massive subcutaneous emphysema was definitely made. He underwent bilateral tube thoracostomy by using a 32 French chest tube under local anesthesia in the fifth intercostal space on the anterior axillary line. The patient was discharged with no complications 10 days postoperatively.

**Key words:** *Subcutaneous emphysema; Pneumothorax; Diagnosis*

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to severe intolerable coughs. He had referred to a general practitioner due to his sore throat and coughs and was prescribed penicillin G, Diphenhydramine syrup and Co-amoxiclav capsules. The therapy ended in vain and further a progressive swelling of the eyelids appeared and spread to the whole face, neck and the proximal part of the upper limbs.

He denied chest pain, dyspnea, dysphagia, nausea or any other symptoms. He had no history of allergies to food or medications. He had Captopril tablets-taken history due to his hypertension. He had no history of smoking.

Moreover he had undergone a surgery due to his left femur fracture resulted from a pedestrian-car accident 17 days ago, in which he had multiple injuries to the head, neck, thorax and lower limbs. Complete assessments were done in the trauma center and after orthopedic operation he was discharged with no complication. A brain CT scan just found mild brain contusion. Other studies were reported normal.

The patient was alert, awake, and had no respiratory distress, cyanosis or tachypnea. Blood pressure was 110/75 mmHg, heart rate of 100 beats per minute and respiratory rate of 12 breaths per minute and temperature of 36.1°C (97°F). Pulse oximetry showed O<sub>2</sub> saturation of 98 percent. The breath sounds were di-

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minished bilaterally and the percussion examination showed bilateral hyperresonance. He had a remarkable edema and crepitus over the whole face, neck, proximal upper limbs and the anterior and posterior chest regions. (Figures 1, 2). Examination of other systems was essentially normal.

As primary step, we prescribed intravenous fluid and nasal O<sub>2</sub>. Then we checked laboratory data including complete blood count, blood urea nitrogen, creatinine, electrolyte levels, prothrombin time, partial thromboplastin time, international normalized ratio and venous blood gas. Also we asked neck and chest CT and an emergent surgery consult.

Results from laboratory findings and electrolyte levels were within normal limits. Chest CT scan demonstrated a large amount of subcutaneous emphysema all over the thorax, remarkable pneumothorax in the right side and a mild pneumothorax in the left side with separation of the lung from the chest wall (Figure 3), a tiny linear fracture of the left transverse process of the second thoracic vertebrae, and also linear fractures in the third, fourth and fifth left ribs which seemed to be missed

in the trauma center 17 days ago. Neck CT scan reported an extensive subcutaneous emphysema and also within the neck muscular compartments and through the spinal cavity.

Based on the history, clinical and imaging findings, the diagnosis of pneumomediastinum and mild left pneumothorax and massive subcutaneous emphysema was definitely made. He was admitted to the emergency department and underwent bilateral tube thoracostomy by using a 32 French chest tube under local anesthesia in the fifth intercostal space on the anterior axillary line. The patient tolerated the procedure with no complications. Then chest radiography was done to control the site of the thoracostomy tubes (Figure 4).

On the first day in the hospital, the lung remained expanded but swelling and crepitus over the anterior chest wall adjacent to the chest tube insertion site decreased and on the second and third days the swelling and crepitus of the posterior chest wall subsided and the face and neck were totally relieved and the chest expansion was decreased. After 10 days of monitoring, the patient was discharged with no complications.



**Figure 1.** Swelling of the face. **Figure 2.** Emphysema on the whole anterior chest wall and the arms. **Figure 3.** Axial chest CT scan showing pneumothorax and subcutaneous emphysema. **Figure 4.** Chest radiography after bilateral tube thoracostomy showing the site of ribs' fractures.

## DISCUSSION

Subcutaneous emphysema causes crepitus on palpation of the affected body region, and pneumomediastinum characteristically gives positive Hamman sign (crunching or clicking noise heard synchronously with the heart beat on auscultation and best heard in the left lateral decubitus position) which is clinically significant.<sup>1</sup>

In such patients, the outpatient differential diagnoses such as angioedema and medication allergy should be ruled out, especially in our patient with the

history of captopril consumption, which can cause angioedema; and also the history of Penicillin G injection, which is one of the allergen drugs. According to the timing of the events in our patient—presence of the swelling and edema just right after injection of the penicillin G, the allergic process parallel to other theories should be kept in mind.

On the other hand the history of coughs since recent 2 days can somewhat be suggestive of microperforation of the trachea caused by severe captured coughs, which can lead to air trapping in the mediastinum.

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