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Spontaneous Subcutaneous Emphysema and Pneumomediastinum

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Abstract:

Spontaneous subcutaneous emphysema is a rare clinical condition. This is an unusual case report of a young lady who presented with spontaneous subcutaneous emphysema in the emergency department without any precipitating cause. Diagnosis was made by the contrast CT scan of chest. This is one of the few reported cases that illustrate early diagnosis and symptomatic management improves outcome in infrequent emergency conditions.

Key words: Cyanosis, Edema, Lung Diseases, Oxygen, Subcutaneous Emphysema.

Introduction

Spontaneous subcutaneous emphysema and pneumomediastinum is defined as the presence of free gas or air in the subcutaneous tissue or mediastinal structures without an obvious precipitating or pulmonary cause [1]. It usually occurs in young adults [2]. Spontaneous subcutaneous emphysema is an infrequent emergency condition. A very few case reports of this condition have been documented till far.

Case Report

A 21 year old thin female presented in the emergency department with a history of acute pain in the neck since last four days. On examination there was a swelling in the neck which bilaterally extended to the shoulder region. Neck pain was acute in onset and on swallowing became severe in nature. Odynophagia was more to solids than to liquids. There was history of crepitus on giving pressure on the swelling. These symptoms started suddenly and there was no prior history of any precipitating cause or chest trauma. Patient was not a known case of any pulmonary disease and other medical disease. There was no history of smoking and alcohol consumption.

A physical examination revealed that her temperature was 36.4°C, pulse 92 per minute, respiratory rate 18 per minute, blood pressure 102/70 mmHg and body mass index (BMI) of 21 kg/m^2. There was no pallor, cyanosis, jaundice, lymphadenopathy, pedal edema or clubbing. Her oral and throat examination was normal. There was swelling around her neck and shoulder region bilaterally. On palpation crepitations were present. There were no such findings on chest wall or

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abdomen. The chest wall was resonant on percussion and there were bilateral normal intensity vesicular breath sounds. Cardiac sounds were normal without any murmurs. Abdominal and central nervous system examination were unremarkable.

Arterial blood gas analysis showed pH: 7.41, pO_2:80 mm Hg, SpO_2:98%, pCO_2:41 mm Hg. Her hemoglobin was 12.2 gm/dL, TLC: 5600/mm^3, DLC: P67/L30/E2/B1, platelet count of 210000/mm^3. Her serum biochemistry and urine analysis were normal. The chest and neck radiograph showed subcutaneous emphysema in the neck and shoulder region. Contrast CT chest done to rule out any esophageal pathology showed subcutaneous emphysema and pneumo-mediastinum [Fig.1].

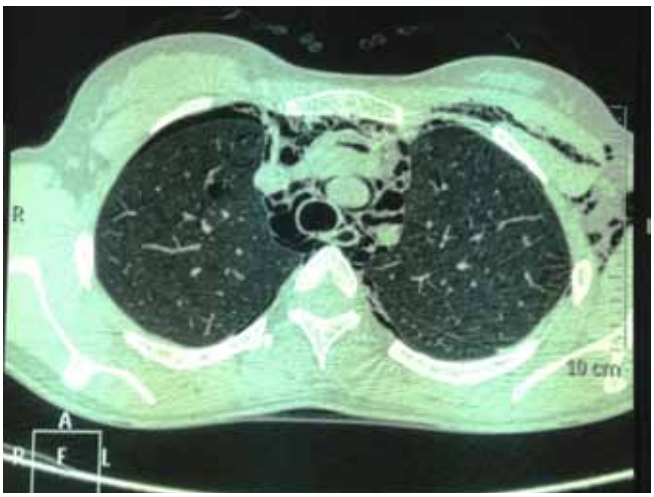

Fig.1: HRCT chest showing air in mediastinum and subcutaneous spaces.

Patient was managed on intravenous fluids, oxygen and analgesics. Subsequently she was shifted on liquid diet. Patient was closely monitored for vitals. Over next 3 days patient's general condition improved and patient was discharged after 4 days.

Discussion

Subcutaneous emphysema was first reported by Hamman in 1939 after which Hamman sign was named [3]. In a retrospective study of 5 years, 18 cases were diagnosed concluding the rare incidence of 1 case in 30,000 cases in emergency department [4]. Different pathophysiologic mechanisms have been proposed. Subcutaneous emphysema mostly occurs in postoperative patients with positive pressure respiration, SCUBA diving, Valsalva type maneuver, excessive phonation, blowing, bronchiolitis, pneumonia, asthma or surgical tooth extraction [5]. This was a unique case which presented with neck pain along with subcutaneous emphysema without any known obvious cause. An increased pressure gradient between the intra-alveolar and interstitial spaces enhances air leakage from small alveolar openings and ruptured alveoli into the perivascular adventitia yielding interstitial emphysema. The pressure gradient favors air dissection along the vascular sheets towards the hilum. Because the visceral layers of the deep cervical fascia are continuous with the mediastinum, air usually decompresses into the neck preventing physiological tamponade and pneumothorax [6].

Clinical diagnosis depends upon size and extension of subcutaneous emphysema and also the presence of crepitus in the swelling. Main differential diagnosis of pneumo-mediastinum is with Boerhaave's syndrome which is characterized by spontaneous rupture of esophagus resulting in pneumo-mediastinum, pneumothorax and subcutaneous emphysema which usually presents with severe pain and retching after vomiting. It is usually seen in alcoholics [7].

CT scan is more sensitive than X-rays in detecting air in retroperitoneal space and pneumo-mediastinum. Diagnosis of pneumo-mediastinum may be missed in 50% cases by X rays alone. Lateral view is more sensitive in detecting air in mediastinum [8]. Gastrografin assay is recommended if esophageal perforation is suspected. Endoscopy

is usually not indicated and imaging to rule out esophageal tear is recommended. Bronchoscopy is relatively contraindicated as it facilitates cough and passage of air from the ruptured alveoli into the mediastinum thus enhancing the pneumo-mediastinum [9].

Spontaneous pneumothorax and pneumo-mediastinum is more frequent clinical condition but less reported generally due to misdiagnosis or under diagnosis. It is self-limited and resolves spontaneously with rest, analgesics and oxygen. Antibiotics are not indicated unless there is infection. High level of suspicion is needed to diagnose, but the overall prognosis is good.

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