Spontaneous pneumomediastinum (SPM) is an uncommon condition defined as the accumulation of free air in the mediastinum without any obvious precipitating cause. The precise nature of this entity is still poorly understood although an abrupt increase in intra-thoracic pressure or volume may play a role in causing this condition. Although usually a benign, self-limiting condition, SPM is not widely recognized by emergency department physicians and should be early differentiated from more serious causes of pneumomediastinum, in particular perforation of the esophagus (Boerhaave’s syndrome), the trachea or a bronchus, severe asthma, blunt or penetrating chest injury or a gas-forming mediastinal infection.

In this article we report on a case of spontaneous pneumomediastinum, presenting as acute chest pain in a 39-year-old man.

Case report

A 39-year-old man was admitted to the emergency department with acute chest pain and severe subcutaneous emphysema extending up to his chin. He had no other symptoms. The emphysema had occurred during a recreational soccer game. During half-time his fellow players noticed the patient had swelling of the neck. He continued playing the second half of the game, but by that time swelling had further increased and the patient decided to obtain medical advice. He didn’t experience any traumatic impact or angina during the game. Medical history was unremarkable. On physical examination subcutaneous emphysema was apparent especially in the supraclavicular and neck area and the right hemithorax. Hammam’s sign could not be elicited because subcutaneous emphysema was also present over the chest wall and this caused crepitations masking this classic sign. Hemodynamically the patient was stable. Laboratory findings, including arterial blood gases, and ECG were normal. Radiographs of the chest showed marked subcutaneous emphysema as well as a pneumomediastinum and a continuous diaphragm sign (Fig. 1). These findings were also seen on CT imaging in addition to a limited pneumothorax on the right, and air surrounding the mediastinum (Fig. 2). Noteworthy, the CT scan did not show any structural pulmonary disorder such as bullae or blebs.

The patient was hospitalized and received oxygen and an NSAID but could be discharged on the next day. He was followed up after 9 days and at that time chest radiography was normal and the subcutaneous emphysema had resorbed (Fig. 3).

Discussion

Spontaneous pneumothorax with pneumomediastinum is a rare condition. Usually it occurs in people younger than 30 years and is more common in men. It also tends to be more common in drug abusers especially cocaine secondary to inhalation method (1).

Spontaneous pneumomediastinum occurs secondary to an abrupt increase in intrathoracic...

Pressure or volume with rupture of alveoli or terminal bronchioles. In a first phase this results in interstitial pulmonary emphysema. The air then tracks along peribronchial tissue to the mediastinum. This occurs because the pressure in the mediastinum is lower than in the lung, a phenomenon designated the Macklin effect. Next air frequently decompresses in the soft tissues of the neck (2).

Clinical symptoms include retrosternal pain, dyspnea and dysphagia. Pain may irradiate to the back region. In the clinical history a Valsalva maneuver may be found as a causative factor (3).

Physical examination reveals supraclavicular subcutaneous emphysema with fine palpable crepitations. A clicking sound synchronous with the heartbeat may be evident designated Hamman’s sign (1).

Differential diagnosis includes cardiac, pulmonary, musculoskeletal and esophageal disorders (3).

On standard chest radiography air is seen outlining the mediastinum and subcutaneous emphysema may also be evident. The continuous diaphragm sign on the anteroposterior view is produced by air trapped posterior by the pericardium. When there is air adjacent to the major branches of the aorta, both sides of the vessel are depicted creating the tubular artery sign. Occasionally, air can reside next to a major bronchus, allowing clear depiction of the bronchial wall and producing the double bronchial wall sign. On CT imaging pneumomediastinum can be confirmed and CT better shows the distribution of the air (4).

Treatment usually is conservative with rest, an NSAID and oxygen to speed resorption of the extrapulmonary air when necessary. A short hospitalisation can be considered. When pneumothorax is associated, insertion of a chest drain may be necessary (3).

In summary, spontaneous pneumomediastinum is a benign but rare condition. It is most common in young men. Imaging findings can be very impressive demonstrating mediastinal and subcutaneous air, but treatment is usually conservative and prognosis is excellent.

References