

## Atypical Pneumomediastinum or "Occult" Esophageal Perforation?

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Spontaneous pneumomediastinum is a rare and generally benign clinical entity. Its incidence is reported as 1 in 25,000–42,000 hospital admissions, higher in younger men [1,2]. A comprehensive description of the pathogenetic mechanisms of spontaneous emphysema has been given before by several authors [1–5]. One of the contributing factors is the development of a pressure gradient across the alveolar wall, which could be the result of exertion on the part of the patient, such as coughing, the Valsalva maneuver, diving, flying at a high altitude, etc. On the other hand, circumstances leading to a weakening of the alveolar wall will decrease the amount of pressure required for its rupture, as occurs with infections and inflammatory responses [2–4].

Following alveolar rupture into the pulmonary interstitium, air dissects along the pulmonary vasculature and eventually into the mediastinum, deep neck fascia, or the retropharyngeal space. In 30% of the patients, no antecedent predisposing activities can be identified [3]. Some patients diagnosed with spontaneous pneumomediastinum present with dominant esophageal symptoms – chest pain, fever, subcutaneous and mediastinal emphysema – suggestive of an esophageal perforation. This is a situation considered to be life-threatening, requiring prompt diagnosis and treatment [1–4], in contrast to conservative management that is indicated in cases of spontaneous mediastinal and soft tissue emphysema due to spontaneous pneumothorax [4,5].

We describe four patients with pneumomediastinum and subcutaneous emphysema of the neck, suffering from dominant esophageal symptoms, suggestive of esophageal perforation.

### Patient Descriptions

#### Patient 1

A 16 year old male was admitted for investigation because of a progressive sore throat, severe pain on swallowing (odynophagia), and upper back pain. A few hours previously, while eating a peach, he suddenly felt a piece of it trapped in his throat. The lateral neck and chest X-ray demonstrated free air around the esophagus, and the chest computed tomography scan showed pneumomediastinum and free air in this area. On indirect laryngoscopy the larynx and hypopharynx were normal. There were no signs of blood or foreign body. Gastrografin followed by barium swallows showed no esophageal abnormalities. The patient was admitted for observation to rule out future development of mediastinitis and was managed conservatively with IV fluids only and antibiotics. His symptoms resolved over the next 72 hours.

#### Patient 2

A 9 year old girl presented because of a sore throat, pain on swallowing, and dysphonia. The sore throat began a few hours previously when, after eating a biscuit, she felt it stuck in her throat. On physical examination, subcutaneous emphysema was palpated around the neck. A lateral neck X-ray showed free air in the soft tissues. Indirect laryngoscopy was found to be normal. CT scan demonstrated subcutaneous emphysema in cervical tissues, pneumomediastinum, and pneumopericard. Suspecting the possibility of an esophageal perforation, a gastrografin swallow followed by a barium swallow were then performed, but showed no esophageal abnormalities. The patient was admitted for observation and managed

conservatively. Subsequent chest X-rays demonstrated a decrease in cervical subcutaneous emphysema, and the symptoms resolved correspondingly.

#### Patient 3

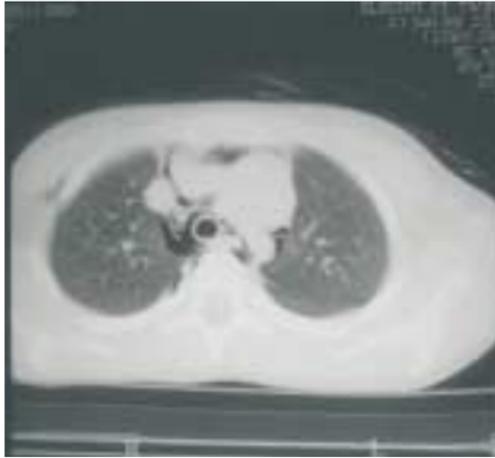
A 22 year old, otherwise healthy, male was admitted because of the abrupt onset of central chest pain that radiated to the left neck, associated with nausea, weakness and fever (38°C) since the previous day. The pain worsened upon coughing. Physical examination did not reveal any abnormal findings. Chest X-ray and CT scan demonstrated cervical subcutaneous emphysema and pneumomediastinum. Indirect laryngoscopy revealed a normal larynx and pharynx and no foreign body or injury. Gastrografin and barium swallows yielded normal findings, and the patient was released home the following day with complete resolution of his complaints.

#### Patient 4

A 22 year old male was admitted due to an X-ray finding of pneumomediastinum 2 days after a fall from a height of 5 meters. The patient had Crohn's disease diagnosed 5 years before and was under permanent steroid treatment. CT scan confirmed the diagnosis of pneumomediastinum, but no pneumothorax, pleural effusion, or fractures were noticed. Gastrografin and barium swallows showed no esophageal abnormalities. After one day of observation he was released home asymptotically.

### Comment

The penetration of air into the soft tissue planes in the neck and the mediastinum is typically documented in young, healthy adult males [1,2]. We do not know whether this phenomenon is typical in young males



Pneumomediastinum and pneumopericard

or is a randomized finding. It is often associated with symptoms that might suggest the possibility of an “occult” mucosal perforation of the hypopharynx or esophagus. In all cases, direct laryngoscopy revealed no foreign body in the hypopharynx and no injury, but subcutaneous emphysema. An esophagoscopy

should be considered in cases where there is a high suspicion of injury to the esophagus. As documented in the literature [4], in those clinically well patients where investigations rule out a foreign body and yield normal findings, treatment should consist of close clinical and radiographic follow-up. After a short follow-up period, such patients may safely be discharged home [1,4].

We believe that this group of patients may represent the phenomenon of “occult,” benign perforation of the esophagus, and therefore all precautions should be taken, including hospitalization, intravenous fluid administration, antibiotics and close observation, until esophageal perforation and mediastinitis are fully ruled out. Therefore, we strongly recommend performing laryngoscopy and contrast studies among the diagnostic procedures.

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