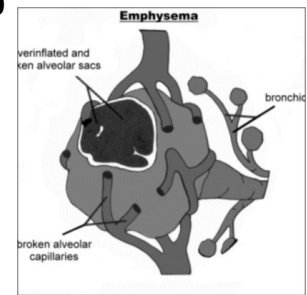


## CASE REPORT

PROF-869

# SPONTANEOUS SUBCUTANEOUS EMPHYSEMA


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**ABSTRACT ...** Spontaneous subcutaneous emphysema and pneumomediastinum may be defined as the presence of free gas or air in the subcutaneous tissue or mediastinal structures without an apparent precipitating cause<sup>1</sup>. It most frequently occurs in young healthy adults without serious underlying pulmonary cause<sup>2</sup>.

**Keywords:** Pneumomediastinum, Subcutaneous emphysema, Mediastinal emphysema

**CASE REPORT**

A 23 year-old (tall and thin) male was admitted in the hospital with three days history of acute neck pain, dysphagia and odynophagia. Dysphagia was mainly to solid foods and he was not complaining of any respiratory symptoms. The above symptoms started without any trauma or precipitating factors and he was in his usual state of good health prior to this event. He had no current history of trauma, aspiration of foreign body or drug abuse. Apart from smoking there was no any history of medical or surgical disease of note.

On examination he was well, temperature was 36.5 C, The blood pressure was 100/60 mm Hg and the pulse was 80 beats/min. There was symmetrical swelling around the neck with crepitation on palpation. There was no chest wall swelling or crepitation on examination. The

chest evaluation demonstrated symmetrical and bilateral clear breath sounds plus normal heart sounds without murmur.

An arterial blood gas analysis in room-air showed: pH 7.413, PaO<sub>2</sub> 13.59 kpa, paCO<sub>2</sub> 5.40 kpa, SaO<sub>2</sub> 97.9% and HCO<sub>3</sub> 24.8 mmol/l. the hemoglobin was 15.6 g/dl, The hematocrit was 43%, the white cell count was 6800 and the platelet as 190,000 per cubic mm. The blood chemistry and urinalysis were normal.

The chest and neck radiograph showed pneumomediastinum and subcutaneous emphysema in the neck (Fig 1) but there was no any evidence of leakage from oesophagus (Fig 2).

He was put on free fluids and subsequently light diet,

analgesia and close observation. After three days his clinical symptoms alleviated to a great extent. He was discharge well from hospital after four days.

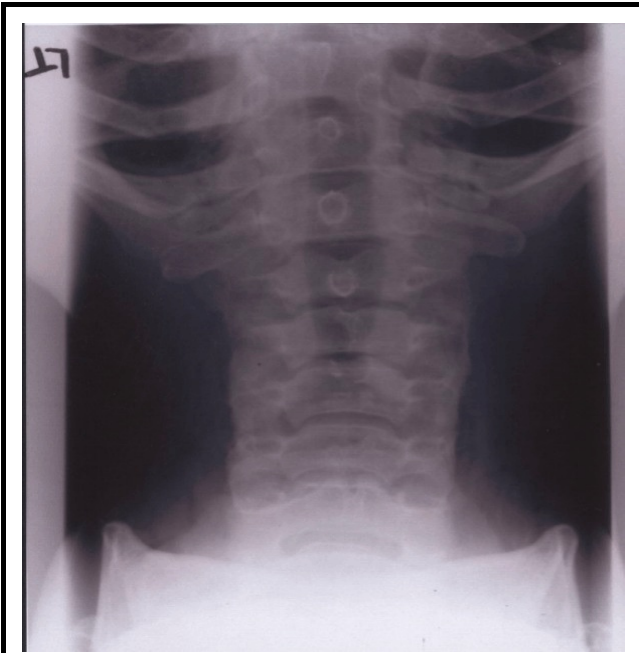


Figure-1. Anteroposterior x-ray of the neck showing subcutaneous emphysema

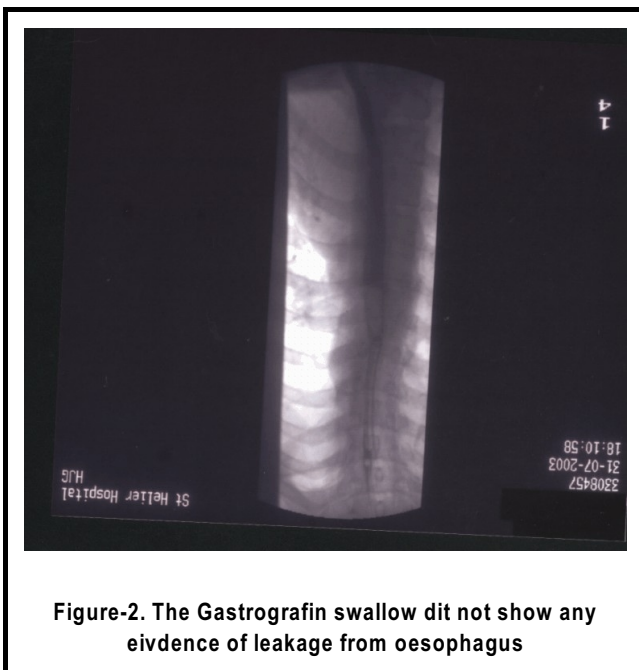


Figure-2. The Gastrografin swallow dit not show any evidence of leakage from oesophagus

## DISCUSSION

Mechanism of air leakage from respiratory tract was initially described by Macklin on the basis of laboratory animal experiment<sup>3</sup>. An increased pressure gradient between the intra-alveolar and interstitial spaces enhances air leakage from small alveolar openings and ruptured alveoli into the peri vascular adventicia yielding interstitial emphysema. The pressure gradient favors air dissection along the vascular sheats towards the hilum. pneumothorax may occur if the mediastinal pressure rises abruptly. However, because the visceral layers of the deep cervical fascia are continuous with the mediastinum, air usually decompresses into the neck, preventing physiological temponade and pneumothorax.

Spontaneous mediastinal or subcutaneous emphysema must be differentiated from Boerhaave's syndrome, which is spontaneous rupture of the oesophagus resulting in pneumomediastinum, pneumothorax, and subcutaneous emphysema. It is most commonly observed in alcoholics with severe vomiting, but it may be associated with any increase in abdominal pressure, including childbirth, seizures, weight lifting or blunt abdominal trauma<sup>4</sup>.

Patients with spontaneous subcutaneous or mediastinal emphysema may present with chest pain, dyspnea, dysphonia, cough, anxiety, neck or throat pain and dysphagia. Physical examination may show neck or facial swelling, neck or chest wall crepitus, tachycardia, respiratory distress or Hamman's sign. All these symptoms and signs are secondary to tissue dissection by air or compression.

Chest X-rays may illustrate multiple thin, lucent streaks outlining mediastinal structures, elevating the mediastinal pleura, and often extending into the neck or chest wall. However, a standard chest X-rays in 50% of cases may miss it especially when it is of small volume. The lateral view is more sensitive and can visualize air in the retro sternal space<sup>5</sup>. CT scan is more sensitive than plane X-rays in detecting free air in mediastinum. Gastrografin swallow is recommended to rule out spontaneous

oesophageal perforation Boerhaave's syndrome) which is the main differential diagnoses especially if retching or vomiting was the precipitating factor. Oesophagoscopy may be dangerous procedure as it may convert a contained into a noncontained oesophageal perforation. Bronchoscopy facilitates cough and passage of air from the ruptured alveoli to the mediastinum thus enhancing the pneumomediastinum hence some reports argue it is contraindicated<sup>6</sup>.

Spontaneous pneumomediastinum and subcutaneous emphysema is probably a more frequent disorder than usually reported because it is under diagnosed or misdiagnosed. It is self-limited and resolves spontaneously with rest. Endoscopy should not be recommended routinely. Imaging to rule out esophageal tear and pneumothorax is recommended including oesophageal contrast study, chest X-ray and sometimes CT scan. Treatment is mainly supportive with the bed rest, analgesia and oxygen.

## REFERENCES

1. Young-Jung Lee et al: **A case of spontaneous pneumomediastinum and pneumopericardium in a young adult.** The Korean Journal of Internal Medicine 2001; 16:205-209.
2. Munsell WP: **Pneumomediastinum: A report of 28 cases and a review of the literature.** J Am Med Assoc 1967; 202:689-693.
3. Maclin CC: **Transport of air along sheaths of pulmonic blood vessels from alveoli to mediastinum: Clinical implication.** Arch intern Med 1939; 64:913-926.
4. Thawley SE: **Air in the neck.** Laryngoscope 1974; 84:1445-1453.
5. Kim SH, JG, Seo JB, et al: **Spontaneous pneumomediastinum on CT: related condition and its clinical significance.** J Korean Radiol Soc 1998; 38:459-462.
6. Jacques B. Jougon: **Assessment of spontaneous pneumomediastinum: Experience with 12 patients.** Ann Thoracic Surg 2003; 75:1711-4.

**Life is nothing without friendship**

**Anonymous**