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# Spontaneous pneumomediastinum

## Case study

A male furniture removalist, 23 years of age, presented to his local doctor with neck swelling. He had an upper respiratory tract infection 2 weeks previously and was prescribed a course of oral antibiotics. He had returned to work 3 days before his presentation and described an episode of sudden onset, sharp, central chest pain while lifting a heavy object. The chest pain subsided within hours but he noticed a neck swelling at the onset of the pain, which has persisted. He pointed to a visible swelling on both sides of the posterior triangle of his neck. The swelling has persisted unchanged for the past 3 days. He smokes but has no other significant past medical history.

## Question 1

What possible causes for neck swelling would you consider in this man?

## Question 2

What would you look for on examination?

## Question 3

What abnormality does the chest X-ray show (*Figure 1*)?

## Question 4

What causes this abnormality?

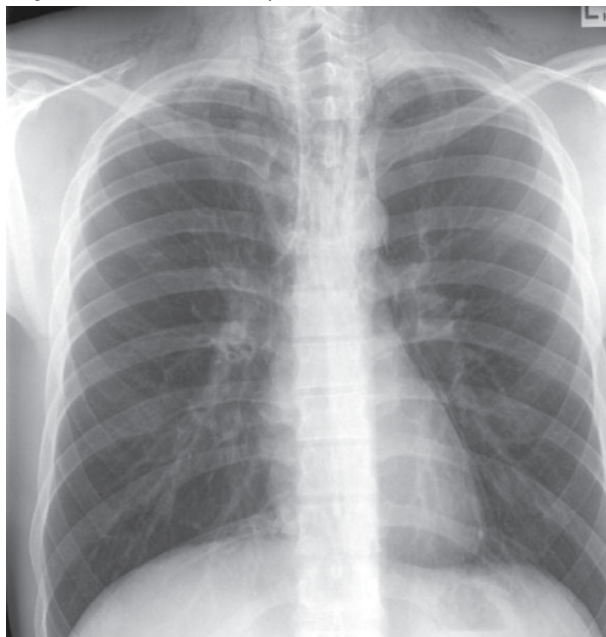
## Question 5

How would you manage this patient?

## Answer 1

Neck masses in young adults are most often caused by infection or neoplasm, although a congenital abnormality can present beyond childhood. When the swelling is rapid in onset, it is usually the result of blood, pus or cystic fluid entering the normal structures of the neck or a pre-existing structural abnormality (eg. infection or haemorrhage into a branchial cyst). A pharyngeal pouch can present with acute neck swelling as food enters the pouch. Rarely, air can cause neck swelling through subcutaneous emphysema.

Figure 1. Patient's chest X-ray



## Answer 2

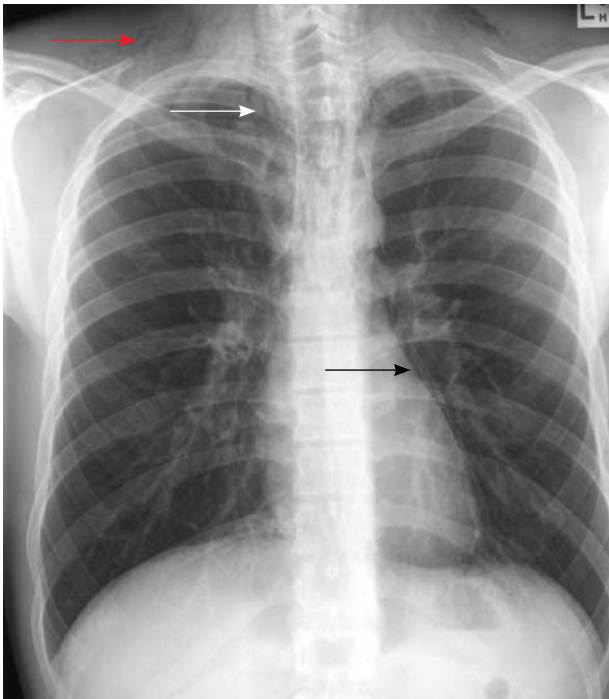
Examination should focus on the mass itself and assessment of airway status. Extrathoracic obstruction at the level of the neck may cause inspiratory stridor if the airway is compromised. This is a medical emergency and the patient should be urgently referred to a hospital emergency department. The head, including the ears, nose and throat, should be examined for an infection or malignancy. Lymph node and abdominal examination should be performed looking for signs of a haematological malignancy.

This patient had a diffuse swelling in the supraclavicular region, with a 'crackly' feeling on palpation. There were no palpable masses and no signs of airway compromise. Precordial examination revealed systolic crepitations (Hamman sign) and reduced heart sounds. The remainder of the examination was normal.

## Answer 3

The chest X-ray (*Figure 2*) shows a pneumomediastinum (white arrow), with air tracking upward to the neck causing subcutaneous

Figure 2. Chest X-ray showing a pneumomediastinum



emphysema (red arrow), and downward into the pericardium causing a pneumopericardium (black arrow). No pneumothorax or rib fractures are visible.

#### Answer 4

Spontaneous pneumomediastinum usually results from ruptured alveoli with dissection of air into the mediastinum or from rupture of the oesophagus (Boerhaave syndrome). Predisposing factors include underlying respiratory illness, chronic cough and recurrent vomiting (which can cause both elevation of alveolar pressures and trauma to the oesophagus). There have been reports of an association with illicit drug use. Risk factors in this case include recent upper respiratory tract infection, smoking and strenuous exertion.

#### Answer 5

No clear guidelines exist regarding the management of spontaneous pneumomediastinum. Most are self limiting and resolve without treatment in under a week. Nonetheless, patients should be referred to an ED for assessment and observation. A computerised tomography (CT) scan of the chest may be required if the diagnosis is not clear. A barium swallow may be indicated if Boerhaave syndrome is suspected from the history. If the pneumomediastinum has not resolved after 1 week, a CT of the chest is indicated to look for a source of persistent air leak.

#### Follow up

This patient remained stable for the 12 hours he was observed in the emergency department. Smoking cessation was strongly

advocated and he was discharged with instructions to see his general practitioner with a follow up chest X-ray in 1 week. He was advised to perform light duties only at work for at least 2 weeks and cautioned against air travel for 6 weeks. He was told to avoid scuba diving lifelong. Follow up by a respiratory physician was recommended to investigate for an underlying respiratory condition.

Conflict of interest: none declared.