

Spontaneous Pneumomediastinum in a Healthy Adolescent

Authors:

Kristen Smolinsky, MD, and Allison W. Brindle, MD

Hasbro Children's Hospital, Warren Alpert Medical School of Brown University, Providence, Rhode Island

A healthy 15-year-old girl presented to a primary care acute clinic with a 1-day history of chest pain, neck swelling, raspy voice, and sore throat.

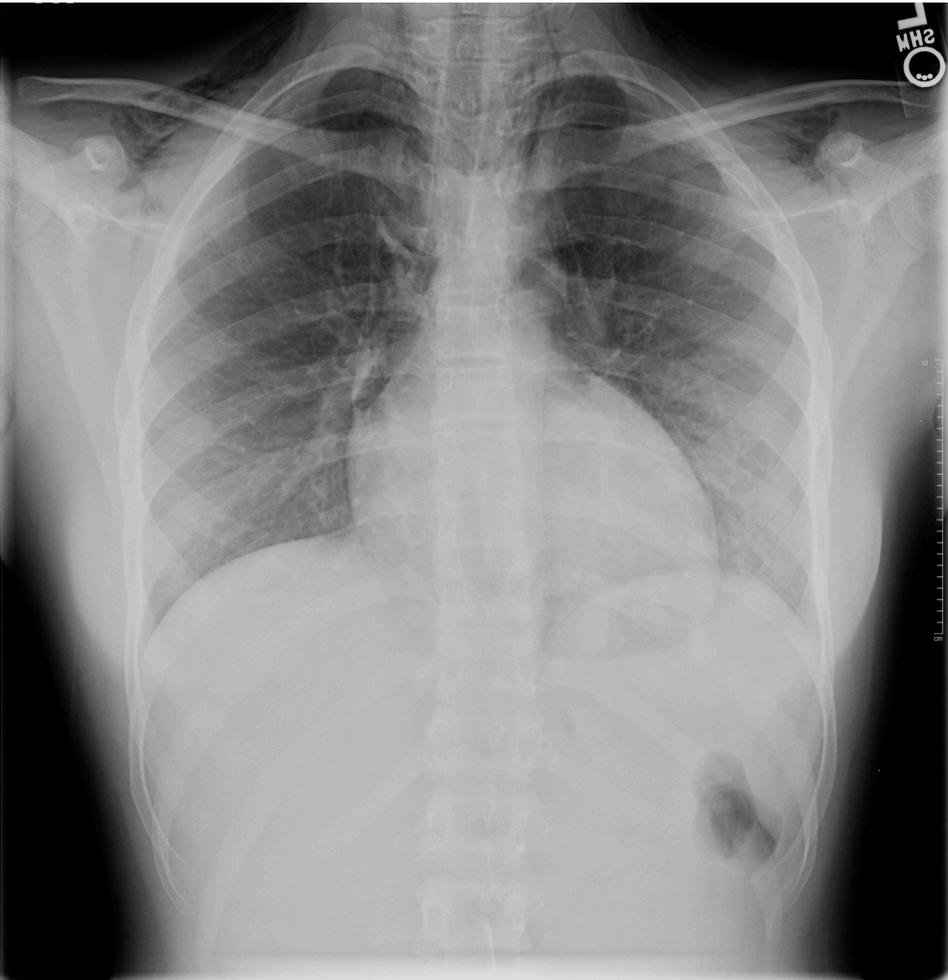
History. She reported that on the day before presentation, she had been sitting in class and had suddenly developed chest pain, back pain, and a sore throat. After school, her mother had noticed that the girl's voice seemed different than usual and that her neck appeared swollen.

At presentation, the girl denied feeling ill, having a fever, or having preceding cold symptoms. At the onset of symptoms, she denied coughing, drinking, vomiting, or physical exertion such as running. She denied any drug use, smoking, or huffing. She had no acute injury to her chest. She had no history of asthma or wheezing.

Physical examination. On examination, her respiratory rate was 20 breaths/min, heart rate was 96 beats/min, and blood pressure was 110/56 mm Hg. She was afebrile. Her oxygen saturation was 100% on room air. She appeared mildly uncomfortable and anxious. Her oropharynx appeared normal, without tonsillar edema, erythema, exudates, or other lesions. Cardiovascular examination findings were normal. She had no respiratory distress or retractions, and she had clear lung sounds throughout on auscultation. Significant crepitus was noted from the most superior region of her neck down to her supraclavicular region bilaterally.

Diagnostic tests. Chest and neck radiographs were obtained, and the results were notable for a large volume of subcutaneous air and pneumomediastinum, with a component of pneumopericardium and possible trace pneumothoraces bilaterally (**Figures 1-4**). She was

referred to the emergency department and was subsequently admitted to the pediatric surgery service.





Figures 1 and 2. *Chest radiographs showed air tracking up the neck and within the supraclavicular fossa bilaterally. Air also can be seen dissecting along the mediastinum, surrounding the heart. There are possible trace pneumothoraces.*



Figures 3 and 4. Soft-tissue radiographs of the neck showed a large volume of subcutaneous

air tracking along the neck, extending superiorly up to the level of the ear, and tracking posterior to the esophagus.

During her admission, electrocardiography results showed normal sinus rhythm, and an esophagram was negative for signs of esophageal leak or rupture. She was monitored overnight for 24 hours with persistently stable vital signs and improvement in her symptoms. She was discharged home the following day; at a follow-up visit 2 weeks later, she had had complete resolution of symptoms.

Discussion. Pneumomediastinum is a condition in which air is present in the mediastinum and is classified as either spontaneous or secondary. The physiology consists of air escaping from the lungs, airway, or esophagus into the chest wall. Spontaneous pneumomediastinum is defined by the presence of air in the mediastinum without obvious causative factors such as trauma, viscous perforation, or infection. These episodes are frequently associated with underlying respiratory disease such as asthma, chronic obstructive pulmonary disease, or malignancy. Secondary pneumomediastinum is defined by the presence of air in the mediastinum with a known inciting cause such as excessive coughing, vomiting, or other events associated with increased intrathoracic pressure. Patients most often present with chest pain, neck pain, dyspnea, and subcutaneous emphysema.¹

Pneumomediastinum is rare in the pediatric population, with an estimated prevalence of 1 in 800 to 1 in 15,500 and a strong male predominance.² The case described here was in an adolescent girl with no apparent inciting event or relevant medical history, which is even more uncommon. In children, predisposing conditions or acute triggers of pneumomediastinum include asthma or respiratory illness with excessive coughing, Valsalva maneuver with vomiting, trauma, foreign body aspiration, or recreational drug use.²

The pneumomediastinum diagnosis is confirmed with anteroposterior chest radiographs including the cervical region, which show air in the mediastinal structures. Computed tomography scans may also be used to further classify the extent of the pneumomediastinum, further investigate indeterminate cases, or search for possible causes.² An esophagram is also sometimes used as a diagnostic test in search of a source.

Pneumomediastinum is generally thought to be benign unless a serious underlying cause is identified. Management is typically aimed at observation and symptomatic treatment, since the majority of cases resolve on their own. The prognosis is good. For uncomplicated case in patients with stable vital signs, observation from home is an appropriate approach. In the case of concurrent pneumopericardium, inpatient observation is recommended due to the risk of cardiac tamponade. Recurrences have been reported but are uncommon.³

References:

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