

A TEEN WITH NECK AND CHEST PAIN

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CASE HISTORY

A 13-year-old female was playing soccer during practice when she was accidentally hit in the anterior neck by a teammate's arm. She presented to Urgent Care the following day with pain in the neck and upper chest.

The patient said she had mild neck pain after being hit, but finished practice without difficulties. She said the pain was sharp, radiated into her chest, and primarily occurred when swallowing. She denied any voice changes, globous sensation, difficulties swallowing, shortness of breath, headache, vision changes, dizziness, neurologic deficit, cough, hemoptysis, abdominal pain, nausea, vomiting, and diarrhea.

On physical examination, vital signs were normal. Lungs were clear to auscultation bilaterally. The anterior neck was not tender and had normal appearance. The trachea was without deformity. The oropharynx was normal. Phonation was normal, and she had no difficulties tolerating secretions. There

was no crepitus on exam and no decreased range of motion at the neck; pain was minimal with movement. A lateral soft tissue neck x-ray was performed in urgent care (Fig. 1).

QUESTIONS

1. What is your differential diagnosis?
2. What does the x-ray (Fig. 1) show?
 - a. Normal x-ray
 - b. Loss of normal lordotic curve
 - c. Right cornu fracture of hyoid bone
 - d. Prevertebral anterior soft tissue neck subcutaneous emphysema
 - e. Steeple sign
3. What is the diagnosis?
4. What would you do next?

ANSWERS

1. Differential would include: muscle strain, pneumothorax, pneumomediastinum, esophageal injury, tracheal injury, laryngeal injury
2. d. Prevertebral anterior soft tissue neck subcutaneous emphysema
3. Pneumomediastinum
4. Transfer to the Emergency Department

DISCUSSION

Pneumomediastinum is a rare condition in which air is present in the mediastinum. This is due to any condition or trauma that results in air escaping from the lungs, airways, or bowel into the chest cavity. This can occur without obvious antecedent trauma (considered primary pneumomediastinum), but typical inducing factors include lung disease such as COPD or asthma, Valsalva maneuver, excessive vomiting, and trauma. It is termed a secondary pneumomediastinum when there is an identifiable cause.¹

The condition is rare but more common in young patients. The main presenting symptom is typically chest pain that often radiates into the neck or back.

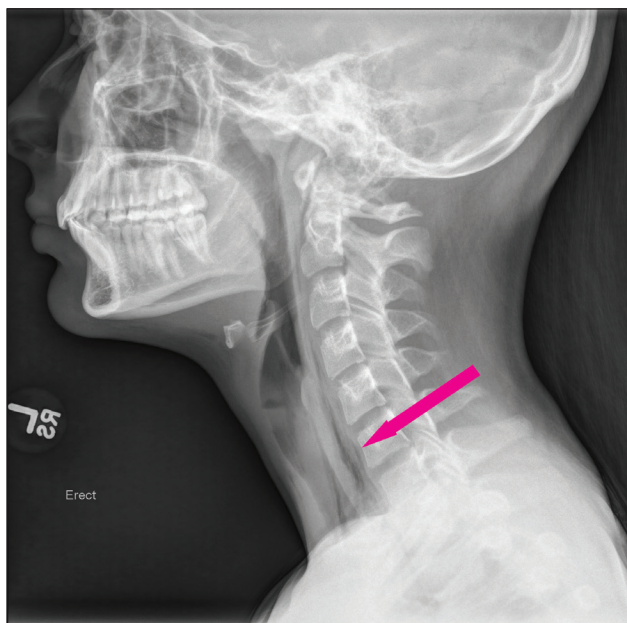


Fig. 1. Lateral soft tissue neck x-ray of 13-year-old female patient.

Other symptoms include dyspnea, coughing spells, neck pain, and dysphagia. Common signs include distorted phonation and neck swelling. Findings may include tachycardia and tachypnea. A nearly pathognomonic, yet uncommon finding, is Hamman's sign: the presence of mediastinal crunch on auscultation over the cardiac apex synchronous with the heartbeat.^{1,2}

The diagnosis of pneumomediastinum is typically made on plain anterior chest film in which a positive study would illustrate lucent streaks outlining mediastinal structures and visible mediastinal pleura. Chest CT is used to confirm the diagnosis in inconclusive cases, assess extent of pneumomediastinum, and attempt to associate a causative factor. Further studies including bronchoscopy, esophagoscopy, and esophagography may be used to further identify an etiology.¹

Pneumomediastinum is typically benign and requires no direct intervention.³ After diagnostic workup has excluded significant pathology, treatment is directed toward symptom relief. Stability of the pneumomediastinum and treatment of any complications is generally adequate for discharge. In rare occasions in which complications or sequelae arise — such as the development of a significant amount of air in the mediastinum, tamponade, airway compression, or pneumopericardium — surgical intervention may be needed.³

The patient was referred to the Penn Medicine Lancaster General Hospital Emergency Department from Urgent Care for further evaluation and treatment. A CT scan was performed, revealing extensive subcutaneous emphysema within soft tissues of the neck (Fig. 2). Based on this finding, an occult perforation involving the esophagus or trachea could not be excluded. The patient was evaluated by Trauma Service and admitted.

An otolaryngology consultant was asked to evaluate for upper airway injury using nasopharyngoscopy. No significant findings were noted, and it was suspected there that the patient had a minor shear injury of one of her bronchi. Thoracic surgery was consulted, and a Gastrografin study was recommended. It did not reveal an esophageal tear.

After the second night of the patient's admission, she had no worsening symptoms and was tolerating a regular diet. She was discharged home with outpatient follow-up.

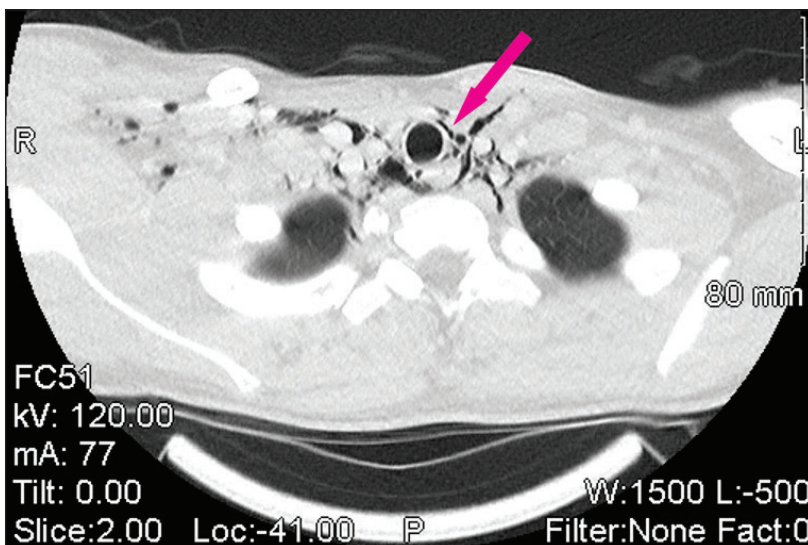


Fig. 2. A CT scan revealed extensive subcutaneous emphysema within soft tissues of the neck.

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