

Pneumomediastinum after acute lymphoblastic leukemia and chemotherapy?

Alain Cruz-Portelles

Alain Cruz-Portelles, Critical Care Medicine Department, V I Lenin University General Hospital, Holguin 80100, Cuba
Author contributions: Cruz-Portelles A solely contributed to this paper.

Correspondence to: Alain Cruz-Portelles, MD, Critical Care Medicine Department, V I Lenin University General Hospital, Lenin Ave., No. 2, Holguin 80100, Cuba. acruz2014@gmx.es
Telephone: +53-5-3140445 Fax: +53-5-3140445

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developed pneumomediastinum, pneumorachis and subcutaneous emphysema, apparently caused by ALL or chemotherapy in the author's opinion, and eventually died.

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Abstract

Pneumomediastinum, pneumorachis and subcutaneous emphysema are frequently benign and most commonly result from air escaping from the upper respiratory tract, intrathoracic airways, or gastrointestinal tract. Gas can also be generated by certain infections or reach the mediastinal space from outside air after trauma or surgery. In the article presented by Showkat *et al* a 14-year-old male patient with acute lymphoblastic leukemia (ALL) under chemotherapy developed pneumomediastinum, pneumorachis and subcutaneous emphysema. In the author's opinion, these complications were caused by ALL or chemotherapy that progressed to severe respiratory failure until the patient finally died in the intensive care unit. I would like to underline some important points, which have been raised following a paper published in the October issue of World Journal of Clinical Cases.

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Key words: Acute lymphoblastic leukemia; Pneumomediastinum; Pneumorachis; Chemotherapy; Case report

Core tip: In the article presented by Showkat *et al*, the authors reported a 14-year-old male with acute lymphoblastic leukemia (ALL) under chemotherapy who

TO THE EDITOR

I read with interest the article presented by Showkat *et al*^[1], where the authors reported a 14-year-old male under chemotherapy for acute lymphoblastic leukemia (ALL) who developed pneumomediastinum, pneumorachis and subcutaneous emphysema of apparently unknown origin. In this case, the doctors assumed that the cause was chemotherapy or ALL, but there are some points I would like to consider.

Pneumomediastinum or mediastinal emphysema is characterized by the entry of air or other gas into the mediastinum most commonly resulting from air escaping from the upper respiratory tract, intrathoracic airways, or gastrointestinal tract. Gas can also be generated by certain infections or reach the mediastinal space from outside air after trauma or surgery (Table 1)^[2].

This particular patient could have been suffering from an idiopathic cause of pneumomediastinum (Hamman's syndrome)^[3], and there are different processes that can explain this condition apart from ALL or chemotherapy: (1) patients who receive chemotherapy frequently vomit and this is a recognized cause of pneumomediastinum; and (2) pneumomediastinum *per se* is frequently benign but oxygenation in this patient was progressively deteriorating. What was the etiology of his respiratory arrest?

Table 1 Etiology of pneumomediastinum

Upper respiratory tract
Head and neck infections
Facial bone fractures
Dental procedures
Mucosal disruption
Tracheotomy
Lower respiratory airways
Chest trauma
Foreign body
Neoplasm
Alveolar rupture: trauma, biopsy, surgery, pleurotomy
Wind instrument playing
Scuba diving
Mechanical ventilation
Gastrointestinal tract
Pneumoperitoneum
Pneumoretroperitoneum
Esophageal perforation (e.g., Boerhaave's syndrome)
Gas producing germs infection
Bacterial mediastinitis
Head and neck infections
Marijuana smoking and cocaine inhalation
Vomiting
Seizures
Coughing, sneezing, hiccupping
Heavy lifting
Air travel
Heimlich maneuver

Did he develop a tension pneumothorax that could explain the respiratory arrest and the deteriorating respiratory condition? What happened while the patient was in the intensive care unit? What was the cause of death in this patient?

Pneumothorax in the supine patient may be difficult to diagnose and must be considered or it will be missed. Occasionally, tension pneumomediastinum may occur, although this is usually of greater clinical likelihood in

pediatric patients. Concomitant pulmonary interstitial emphysema will result in further respiratory embarrassment secondary to compression of lung parenchyma by interstitial air, and decreases in both ventilation and perfusion, especially after mechanical ventilation. Tension pneumopericardium could complicate the presentation and impair venous return and cardiac function^[4]. Air embolism or pneumocephalus are infrequent but could be ruled out^[4,5]. No computed tomography scans or X-rays were mentioned later in the evaluation. Different investigations are not clear in this case that could help in the diagnosis.

In my opinion, chemotherapy or ALL *per se* does not explain the mechanism of production of pneumomediastinum, pneumorachis or subcutaneous emphysema. This association was possibly a coexisting condition instead of a complication of ALL or chemotherapy as the authors affirm. Unfortunately, there was no autopsy to establish the final diagnosis.

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