



Case Report

Journal Homepage: <http://crp.tums.ac.ir>

Why the Lung Doesn't Expand After Chest Tube Insertion?(Learning from Errors)

Peyman Hafezimoghadam¹, Aydin Mohammadvalipoor¹, Nazanin Alaei Faradonbeh^{1*}

Department of Emergency Medicine, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Use your device to scan and read the article online



Citation Hafezimoghadam P, Mohammadvalipoor A, Alaei Faradonbeh N. Why the Lung Doesn't Expand After Chest Tube Insertion?(Learning from Errors). Case Reports in Clinical Practice. 2022; 7(5): 257-260.

Running Title False Chest Tube Insertion

**Article info:**

Received: August 14, 2022

Revised: August 29, 2022

Accepted: September 18, 2022

Keywords:

Chest tube; Pneumothorax; lung; trauma

ABSTRACT

Chest tube insertion is one of the common and critical procedures in emergency room. The most common tool for chest tube position confirmation is chest x-ray. The aim of this case report is to explain one of pitfalls of this tool in confirmation of chest tube position.

The patient was a 36-year-old man who had been transferred to ED by EMS due to blunt chest trauma in a motor vehicle collision. After detecting pneumothorax in chest CT scan, chest tube has been inserted and chest x ray has been done for chest tube's place confirmation. X-ray ascertains that the tube is in the right place but lung does not expand and dyspnea does not improve completely. In chest CT scan which will be done after 2 days, it reveals that chest tube was in subcutaneous tissue.

Although chest x-ray is a useful modality to confirm chest tube placement, chest tube function can define important information and imaging should be interpreted beside clinical course. It should be noted that in the case of current report, the physical examination is used.

Introduction

Traumatic pneumothorax is a critical diagnosis in emergency room and chest tube insertion is still the most common procedure for definite treatment of pneumothorax. In most of emergency rooms, chest x-ray is still routinely done to confirm the right place of chest tube in pleural space but as any other diagnostic tools it has

blind spots. The aim of this case report is to explain one of pitfalls of this tool in confirmation of chest tube position.

Case presentation

The patient was a 36-year-old man who was brought to emergency room due to blunt chest trauma during motor vehicle collision when he was driving a car. On his arrival, he was alert. The airway was open

*** Corresponding Author:****Nazanin Alaei Faradonbeh****Address:** Department of Emergency Medicine, School of Medicine, Iran University of Medical Sciences, Tehran, Iran**E-mail:** alaei.n@iums.ac.ir

and cervical collar was worn by Emergency Medical Service (EMS). In breathing examination, tenderness and decreased breathing sounds were detected in left hemi thorax but he was not in respiratory distress. In circulation evaluation, blood pressure was 135/65 mmHg and no external bleeding was noted. Blood samples were taken and intravenous crystalloid fluid got started. Disability evaluation and logroll were not remarkable. In extended-FAST Lung sliding could not be detected on left side of hemi thorax.

In AMPLE history, there was not any history of allergies, previous disease and taking medications and his last oral intake was about 5 hours ago (The event was mentioned earlier).

In head-to-toe examination, there was not any additional information.

The patient was transferred to radiology department for chest CT scan (Fig. 1).

As you can see in the chest CT scan, pneumothorax has been detected in left hemi thorax and in next step chest tube would be inserted in left pleural space and after checking for oscillation (although low oscillation has been mentioned in the patient's sheet) chest x-ray has been done for tube place confirmation (Fig. 2).

After confirmation of chest tube placement according to the patient's chest x-ray, he would be admitted in

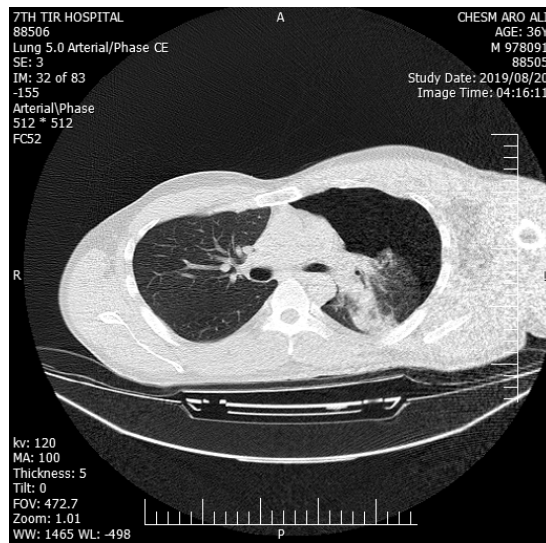


Fig. 1. The chest tube is out of the thorax cavity and in the subcutaneous tissue

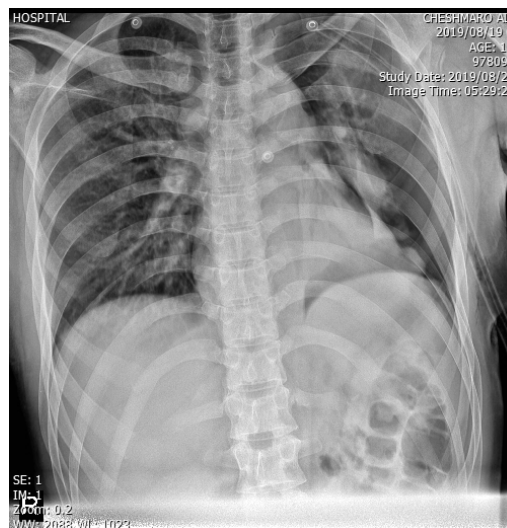


Fig. 2. lung does not expand after chest tube insertion

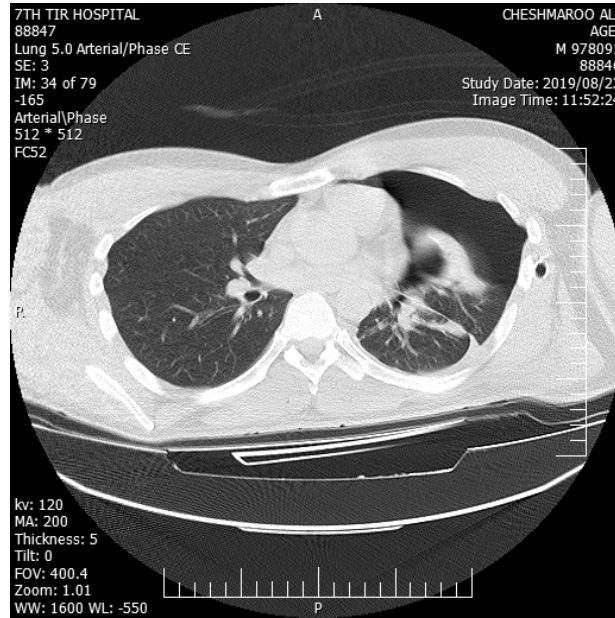


Fig. 3. Left side pneumothorax

surgery ward after a short period of time. Despite of supportive care, the patient's dyspnea would not resolve in next hours. After 48 hours, he would be transferred for chest CT scan to find out "What is the problem?" (Fig. 3).

As you can see in the figure, the tube is in subcutaneous tissue and the lung doesn't have been expanded after 2 days from chest tube insertion due to chest tube malposition.

Discussion

Although there is no consensus on doing chest x-ray after chest tube insertion, to check the position of the tube and to see how effective the tube is, most clinicians routinely do chest x-ray after chest tube insertion [1].

Rare subcutaneous malposition of tube can occur and it will be detected clinically by lacking of oscillation [2]. But in some cases, after subcutaneous chest tube insertion and fixation by sutures, we may see some oscillation due to negative pressure transfer from pleural space to subcutaneous tissue [3]. Therefore, the chest x-ray is still the most practical imaging tool to confirm tube position but the main point is that: "it has some limitations either".

We reported a case of traumatic pneumothorax which after subcutaneous mispositioning of chest tube, two different physicians could not recognize

the tube malposition due to mimicking right position of the tube in chest x-ray, beside the presence of oscillation in the bottle.

After two days and by observing the lack of symptoms improvement, the chest CT scan was performed and subcutaneous position of the tube was detected.

Conclusion

In conclusion, although chest x-ray is a valuable tool to confirm chest tube position, it should be interpreted, beside patients' clinical status and physical examination, to avoid errors.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or nonprofit sectors.

Conflict of Interests

The authors have no conflict of interest to declare.

References

1. Goodman MD, Huber NL, Johannigman JA, Pritts TA. Omission of routine chest x-ray after chest tube removal is safe in selected trauma patients. *The American journal of surgery*. 2010 Feb 1;199(2):199-203. <https://doi.org/10.1016/j.amjsurg.2009.03.011>
2. Remérand F, Luce V, Badachi Y, Lu Q, Bouhemad B, Rouby JJ. Incidence of chest tube malposition in the critically ill: a prospective computed tomography study. *The Journal of the American Society of Anesthesiologists*. 2007 Jun 1;106(6):1112-9. <https://doi.org/10.1097/01.anes.0000267594.80368.01>
3. Seet E, Sim J. Malposition of thoracostomy tubes leading to missed haemothorax and tension pneumothorax. *Anaesthesia and intensive care*. 2011 May 1;39(3):513.