



# Breast Implants and Bilateral Tension Pneumothorax Following Blunt Chest Trauma

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## Abstract

A 38-year-old woman was admitted to our trauma centre with a complete left pneumothorax. The chest tube implementation procedure was aborted quickly because of a very difficult dissection (subcutaneous emphysema over two voluminous breast implants). The patient was transferred to the imaging room without chest tube insertion due to respiratory and haemodynamic stability. During transfer, the patient presented with cardiac arrest due to tension pneumothorax. The time benefit with the use of immediate total body computed tomography has been reported. A simple and rapid initial imaging assessment including chest and pelvic X-rays and four-chamber view and 'swing technique' ultrasound protocol enables the appropriate emergency decisions. While this diagnostic approach is time consuming, it nevertheless allows a reduction in the time needed to initiate life-saving interventions for the most severe patients. This case reminds us that even if patients are stable, drainage of a complete pneumothorax under mechanical ventilation should not be delayed, especially in case of technical difficulties.

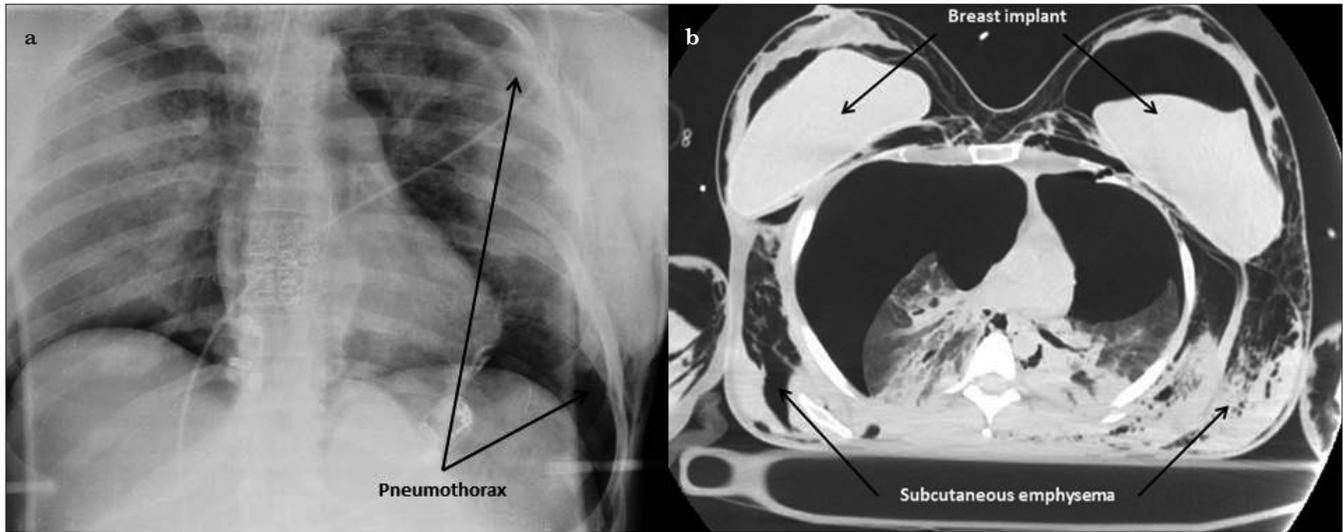
**Keywords:** Blunt chest trauma, breast implants, tension pneumothorax

## Introduction

Emergency chest drainage in obese patients is difficult (1). Fingered dissection should always be preferred to rigid trocar-assisted chest tube insertion. What about patients with breast implants? Pneumothorax is one of the most poorly understood and least frequently reported complications associated with breast augmentation (2). To our knowledge, emergency chest drainage following blunt chest trauma in patients with voluminous breast implants is not reported in the literature. Written consent was provided by the patient for this case report.

## Case presentation

We report a case of a 38-year-old woman who was admitted to our trauma centre following a suicide attempt by defenestration. On arrival at the triage zone, the patient was sedated and mechanically ventilated. Her haemodynamic status was reassuring. Clinical symptomatology was dominated by a cervicothoracic subcutaneous emphysema over two voluminous breast implants associated with hypoxaemia (96% SpO<sub>2</sub>–0.6 FiO<sub>2</sub>), decrease in left basal breath sounds and a distended abdomen. Four-chamber view and 'swing technique' (FAST) echo because of breast implants and emphysema could not localise pneumothorax. Chest X-ray showed a complete left pneumothorax and a right pneumothorax, in which volume was not assessable because of artefacts (Figure 1a). We therefore decided to place a chest tube at the 4<sup>th</sup> or 5<sup>th</sup> intercostal space on the left mid-axillary line with fingered dissection performed by an experienced operator. The procedure was aborted quickly because of a very difficult dissection due to the presence of implants and emphysema. So as not to create an iatrogenic lesion and due to respiratory and haemodynamic stability, the patient was transferred to the imaging room without chest tube insertion.



**Figure 1. a, b. Chest X-ray. (a) Thoracic computed tomography scan (b)**

During transfer, her clinical condition deteriorated with the appearance of desaturation, hypotension, increased subcutaneous emphysema and the appearance of very voluminous abdominal emphysema. During the installation on the computed tomography (CT) table, the patient presented with cardiac arrest, and the diffuse emphysema continued to increase with each insufflation. Tension pneumothorax was immediately diagnosed. A cardiac massage was initiated. All anatomical landmarks were altered or abolished with regard to chest decompression. The insertion of a large bore needle into the second intercostal space crossing the mid-clavicular line was impossible. Bilateral blind thoracostomy with fingered dissection was once again unsuccessful because the ribs were impossible to reach. We decided to perform a quick scan to help us find our way (Figure 1b). CT scan showed subcutaneous emphysema dissecting the cervical and all the thoracic walls, breasts around the breast implants, descending along the abdominal wall to the inguinal folds. We finally inserted a rigid trocar-assisted chest tube, allowing the immediate resumption of circulatory activity (low flow: 6 min). The patient left the intensive care unit 1 month after admission and completely recovered.

## Discussion

Subcutaneous emphysema and/or breast implants may compromise localisation and early therapeutic intervention of a pneumothorax in the triage zone. We had considerable difficulties in decompressing a near fatal tension pneumothorax and in placing a chest tube. Our goal in describing this case is to recall simple and pragmatic messages in stressful conditions in the trauma room. Indeed, in essence, the case report reconfirms the need for draining a pneumothorax in patients who are mechanically ventilated. In this regard, it does not introduce a novel management aspect. And yet we think that

this case provides actual advice as to how to proceed in case such situation occurs in the future. We must keep calm and not delay chest tube implementation.

As life-saving interventions in the trauma room are time consuming, the trauma team sometimes accepts additional minutes of diagnostic time and proceeds with CT scanning to exclude salvageable injuries instead of undertaking non-essential invasive procedures. Nevertheless, the number of patients who would benefit from immediate total body CT remains unclear (3). The more we manage trauma patients, the more we understand the 'philosophy' of management evolve to a quasi-systematic immediate total body CT. In the absence of hindsight on the pathology, the most recent data in the literature are sometimes misinterpreted by the younger colleagues. It seems to us that their interpretation of the conclusions can sometimes be confusing. Whole body CT is recommended as a standard diagnostic method during the early resuscitation phase for patients with polytrauma (4). CT scan is the only tool that allows an exhaustive early assessment of primary trauma. Nevertheless, its positioning remains to be defined in the diagnostic approach. It can be performed in the very first line of imaging, shortening the time to obtain the full injury report, or occur only after an initial evaluation stage with delocalised imaging (FAST ultrasound protocol or X-ray), allowing then to initiate therapeutics and to prevent rapid clinical degradation during the CT examination process. A recent study did not reveal a difference in mortality between these two strategies, either in the general population or in the subgroups of patients with multiple trauma or severe traumatic brain injury (3). Yet CT rooms were installed in or close to the trauma rooms. Peytel et al. (5) demonstrated that a simple and rapid initial imaging assessment including chest and pelvic X-rays and abdominal ultrasonography enables the appropriate emergency decisions regarding the need

for chest drainage, pelvic artery embolisation and laparotomy. Thus, while this diagnostic approach is time consuming, it nevertheless allows a reduction in the time needed to initiate life-saving interventions for the most severe patients. We do not agree that this approach is of less interest to stable trauma patients. In fact, the regular practice of this approach, including in stable patients, also allows the maintenance of individual and team skills in the most severe clinical settings.

Finally, we should keep in mind that the clinical view always needs to be integrated in the decision-making process, and that the recommended safe strategy of exsufflation or chest tube insertion (6) may not be able to be used in these exceptional situations.

## Conclusion

A posteriori, we should have insisted to implement the chest tube procedure (probably with a rigid trocar-assisted procedure). We should remember that even if patients are stable, a complete pneumothorax under mechanical ventilation must be evacuated in the trauma room, especially if they are technically difficult and should not be delayed. This is the main objective of the trauma room. It is sometimes educational to recall evidences, precisely so that they remain evidences, for the training of residents and for the most experienced of us.

**Informed Consent:** Written informed consent was obtained from patient who participated in this case.

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