Large pneumothorax in blunt chest trauma: Is a chest drain always necessary in stable patients? A case report

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1. Introduction

Thoracic injury is a major cause of trauma-related death. Accumulation of air in the pleural cavity (pneumothorax) is the most common potentially life-threatening injury in blunt chest trauma [1]. The management of pneumothorax depends on the etiology, its size and hemodynamic stability of the patient. Current guidelines vary in recommendations with regard to the best approach for the management of blunt traumatic pneumothorax [2]. Most clinicians agree that chest drainage is essential for the management [3]. Herein, we present a case of large pneumothorax in blunt chest trauma patient that resolved spontaneously without a chest drain.

2. Case report

A 63- year- old man presented to the Emergency Department complaining of left lateral chest pain due to a fall on his chest at home. He has history of benign essential hypertension. On examination, he was afebrile, his pulse rate was 69 bpm, blood pressure 160/90, and respiratory rate was 18/min. His pulse oximetry showed oxygen saturation of 98% on room air. Chest examination showed localized tenderness over his left lateral chest wall with decreased air entry in the left lung’s apex and middle zones. Chest X-ray has shown left sided pneumothorax (Fig. 1). CT scan of the chest showed pneumothorax of more than 30% of the left hemithorax (around 600 ml of air) with multiple left ribs fracture. Patient refused tube thoracostomy and was admitted to surgical department for close observation. The patient was managed conservatively without chest tube insertion. A repeat CT scan of the chest has shown complete resolution of the pneumothorax.

DISCUSSION: The clinical spectrum of pneumothorax varies from asymptomatic to life threatening tension pneumothorax. In stable patients, conservative management can be safe and effective for small pneumothorax. To the best of our knowledge, this is the second reported case in the English literature with large pneumothorax which resolved spontaneously without chest drain.

CONCLUSION: Blunt traumatic large pneumothorax in a clinically stable patient can be managed conservatively. Current recommendations for tube placement may need to be reevaluated. This may reduce morbidity associated with chest tube thoracostomy.

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He was hemodynamically stable throughout his stay in the hospital. Pulse oximeter oxygen saturation was maintained above 97%. The patient refused any kind of chest drain even needle or catheter aspiration.

Follow up chest X-ray showed slight reduction in the size of pneumothorax. The patient was discharged home on the 6th day of admission. He was followed up in the Surgical Clinic and he remained a symptomatic. After 3 months, repeated CT scan of the chest showed complete resolution of the pneumothorax (Fig. 4).

### 3. Discussion

The clinical spectrum of pneumothorax varies from asymptomatic to life threatening tension pneumothorax [4]. Diagnosis is usually made by clinical examination and simple erect chest X-ray. Most of the Emergency Physicians and Surgeons have low threshold for the placement of tube thoracostomy for traumatic pneumothorax.

According to the Advanced Trauma Life Support (ATLS) guidelines, any traumatic pneumothorax is best treated with a chest tube insertion because of the possibility of the development of tension pneumothorax [3]. Nevertheless, tube thoracostomy may be associated with significant morbidity and even mortality [5].
In stable patients, conservative management can be safe and effective for small pneumothorax (less than 15% of the lung field or less than 2.5 cm in size on chest X-ray) [6–8]. They resolve by resorption at a rate of 1.25% per day [5]. The rate may increase four folds by supplemental oxygen [9].

To the best of our knowledge, this is the second reported case in the English literature with large pneumothorax which resolved spontaneously without chest drain [10].

We were expecting complications related to this large pneumothorax especially tension pneumothorax. However, the patient continuously refused to drain the pneumothorax. We kept him under close observation and pulse oximetry monitoring. We explained to the patient that decompression by either needle or chest tube insertion may be urgently needed at any time. The patient remained hemodynamically stable without clinical deterioration. The pneumothorax completely resolved on conservative management.

4. Conclusion

Blunt traumatic large pneumothorax in a clinically stable patient can be managed conservatively. Current recommendations for tube placement may need to be reevaluated. This may reduce morbidity associated with chest tube thoracostomy.

Conflict of interest

None declared by all the authors.

Consent of patient

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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Author contribution

Baig M. Idris: Study concept, data collection, interpretation, writing the first draft, and editing the paper.

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All the authors are responsible for the article.

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