



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

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

Baig M. Idris^a, Ashraf F. Hefny^{b,*}^a Department of Emergency Medicine Al Rahba Hospital, Abu Dhabi, United Arab Emirates^b Department of Surgery, Al Rahba Hospital, Abu Dhabi, United Arab Emirates

ARTICLE INFO

Article history:

Received 5 April 2016

Received in revised form 12 May 2016

Accepted 13 May 2016

Available online 19 May 2016

Keywords:

Case report

Pneumothorax

Thoracostomy

Trauma

ABSTRACT

INTRODUCTION: Pneumothorax is the most common potentially life-threatening blunt chest injury. The management of pneumothorax depends upon the etiology, its size and hemodynamic stability of the patient.

Most clinicians agree that chest drainage is essential for the management of traumatic large pneumothorax. Herein, we present a case of large pneumothorax in blunt chest trauma patient that resolved spontaneously without a chest drain.

PRESENTATION OF CASE: 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. On examination, he was hemodynamically stable. An urgent chest X-ray showed evidence of left-sided pneumothorax. 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.

© 2016 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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.

* Corresponding author at: Department of Surgery, Al Rahba Hospital, Abu Dhabi Clinical Assistant Professor, Trauma Group, Department of Surgery, CMHS, Al-Ain P.O. Box 18532 Main Building of Post Office, Al-Ain, United Arab Emirates.

E-mail addresses: ahefny@uaeu.ac.ae, hefnayashraf@hotmail.com (A.F. Hefny).

<http://dx.doi.org/10.1016/j.ijscr.2016.05.019>

2210-2612/© 2016 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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 (2nd to 6th ribs) (Fig. 2). Arterial blood gas analysis was normal.

The patient refused insertion of chest tube and he was admitted to the Surgical Department for close observation. Supplemental oxygen and analgesics were administered. Follow up of the pneumothorax size was performed by serial chest X-ray and ultrasound mapping (Fig. 3).

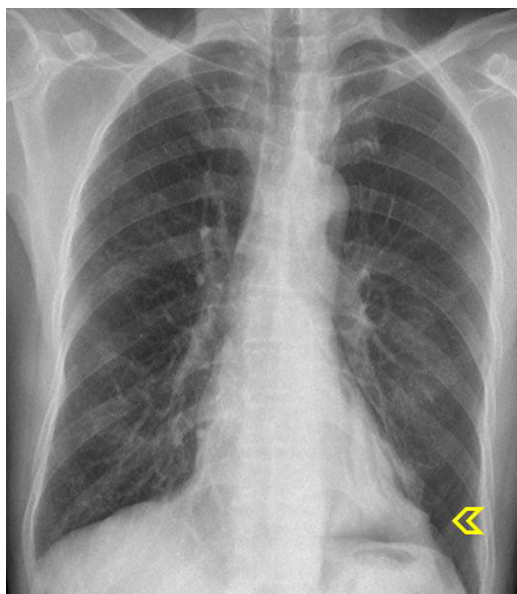


Fig. 1. A chest X-ray demonstrating pneumothorax (arrow head) in the left hemithorax.

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).

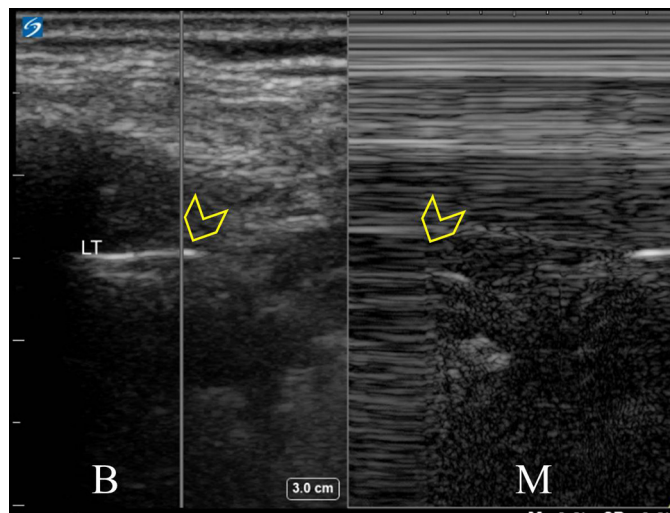


Fig. 2. Ultrasound scan for mapping of the left pneumothorax. The lung point sign (arrow head) showed in B-mode (B) and in M-mode (M). (Sonographic study was performed by Dr. Ashraf F Hefny, Department of Surgery, Al Rahba Hospital, Abu Dhabi, UAE)

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].

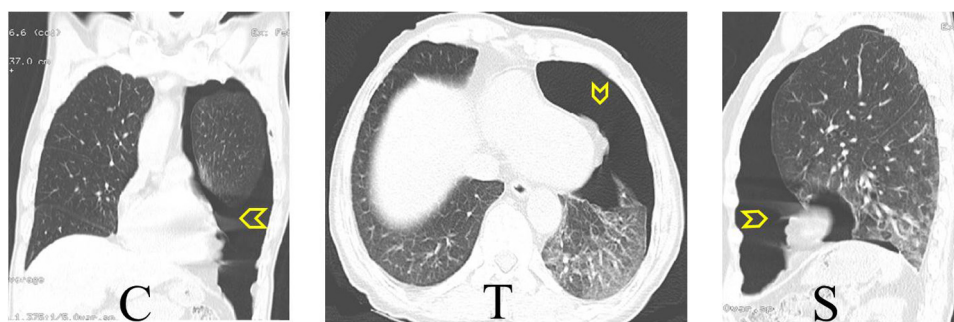


Fig. 3. CT scan of the chest showing large left pneumothorax (arrow head) in the coronal (C), transverse (T), and sagittal (S) cuts.

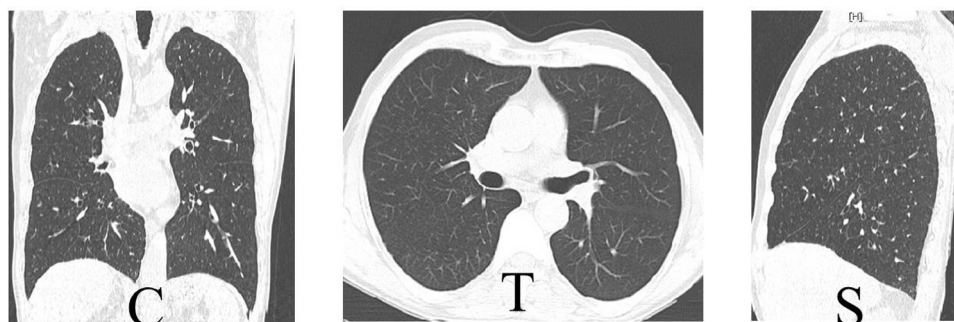


Fig. 4. CT scan of the chest showing complete resolution of the pneumothorax in the coronal (C), transverse (T), and sagittal (S) cuts.

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.

Funding

Self-funded.

Author contribution

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

Hefny A.: Study concept, data collection, interpretation, editing the paper.

Guarantor

All the authors are responsible for the article.

References

- [1] H. Wilson, J. Ellsmere, J. Tallon, A. Kirkpatrick, Occult pneumothorax in the blunt trauma patient: tube thoracostomy or observation, *Injury* 40 (2009) 928–931.
- [2] A.C. Miller, J.E. Harvey, Guidelines for the management of spontaneous pneumothorax. standards of care committee, British thoracic society, *BMJ* 307 (1993 10) 114–116.
- [3] American College of Surgeons Committee on Trauma, ATLS Advanced Trauma Life Support Program for Doctors American College of Surgeons, 9th ed., American College of Surgeons, Chicago, IL, 2012.
- [4] A. Papagiannis, G. Lazaridis, K. Zarogoulidis, A. Papaiwannou, A. Karavergou, S. Lampaki, S. Baka, I. Mpoukovinas, V. Karavasilis, I. Kioumis, G. Pitsiou, N. Katsikogiannis, K. Tsakiridis, A. Rapti, G. Trakada, I. Karapantzos, C. Karapantzou, A. Zissimopoulos, P. Zarogoulidis, Pneumothorax: an up to date introduction, *Ann. Transl. Med.* 3 (4) (2015) 53.
- [5] L.T. Kircher Jr., R.L. Swartzel, Spontaneous pneumothorax and its treatment, *J. Am. Med. Assoc.* 155 (1954) 24–29.
- [6] G. Johnson, Traumatic pneumothorax: is a chest drain always necessary? *J. Accid. Emerg. Med.* 13 (1996) 173–174.
- [7] L. Symington, E. McGugan, Towards evidence based emergency medicine: best BETs from the Manchester Royal Infirmary. Bet 1: is a chest drain necessary in stable patients with traumatic pneumothorax? *Emerg. Med. J.* 25 (2008) 439–440.
- [8] M. Henry, T. Arnold, J. Harvey, Pleural diseases group, standards of care committee, British thoracic society: BTS guidelines for the management of spontaneous pneumothorax, *Thorax* 58 (Suppl. 2) (2003) ii39–ii52.
- [9] T.S. Chadha, M.A. Cohn, Noninvasive treatment of pneumothorax with oxygen inhalation, *Respiration* 44 (1983) 147–152.
- [10] M.T. Ryan, N.D. Caputo, V. Lakdawala, F. Jara, Spontaneous resolution of a large traumatic pneumothorax, *Am. J. Emerg. Med.* 30 (833) (2012) e3–e5.

Open Access

This article is published Open Access at sciedirect.com. It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.