

Successful Early Surgical Treatment of Fatal Blunt Chest Trauma: A Case Report

 Davut Tekyol¹,  Handan Tanrıkulu²,  İbrahim Altundağ¹,  Nihat Müjdat Hökenek³,
 Umut Gökhan Özder¹

¹Department of Emergency Medicine, University of Health Sciences, Hamidiye Faculty of Medicine, Haydarpaşa Numune Health Application and Research Center, Istanbul, Turkey

²Department of Thoracic Surgery, University of Health Sciences, Hamidiye Faculty of Medicine, Haydarpaşa Numune Health Application and Research Center, Istanbul, Turkey

³Department of Emergency Medicine, Kartal Dr. Lutfi Kırdar Training and Research Hospital, Istanbul, Turkey

Abstract

Blunt thoracic trauma is a common form of chest injuries that can be mortal on both sides of the thorax leading to potentially fatal respiratory or cardiovascular compromise. As blunt thoracic trauma may lead to fatal outcomes, emergency interventions are needed. Proper management of blunt chest trauma with timely chest tube thoracostomy should be considered, whenever necessary, optimal pain control and chest physiotherapy result in a good outcome in the majority of patients. Here, we present a case report of a polytraumatic patient with bilateral pneumothoraces with multiple rib fractures after a severe blunt trauma successfully treated by bilateral tube thoracostomy.

Keywords: Bilateral hemopneumothorax; blunt chest trauma; tube thoracostomy.

Thoracic trauma constitutes approximately 25-50% of all traumas in all age groups. Blunt thoracic trauma is a common form of chest injuries which does not involve any opening of the chest wall. Blunt thoracic trauma may vary in severity from minor bruising or an isolated rib fracture to mortal severe crush injuries on both sides of the thorax leading to potentially fatal respiratory or cardiovascular compromise. Thoracic trauma is a frequent cause of morbidity and even mortality. Two-thirds of patients with multiple injuries suffer from blunt chest trauma. Severe thoracic trauma is associated with multiple injuries in 70-90% of the cases. The mortality rate from these injuries may be as high as 60% due to the more frequent simultaneous injury of multiple organs. Here, we present a case report

of a polytraumatic patient with bilateral pneumothoraces with multiple rib fractures after a severe blunt trauma successfully treated by bilateral tube thoracostomy.

Case Report

Patient's consent was obtained for this study. A 60-year-old previously healthy male smoker sustaining non-penetrating chest trauma was taken to the emergency department after a workplace accident with fallen bricks on his chest. On arrival at the Emergency Department, he was in severe pain at his back and respiratory distress. He was mentally alert (Glasgow Coma Scale 15). He explained that he was injured with bricks fallen from a few meters high on his chest. The patient was hemodynamically stable (Blood pressure

Correspondence (İletişim): Davut Tekyol, M.D. Sağlık Bilimleri Üniversitesi Hamidiye Tıp Fakültesi, Haydarpaşa Numune Sağlık Uygulama ve Araştırma Merkezi, Acil Tıp Kliniği, İstanbul, Turkey

Phone (Telefon): +90 530 233 08 82 **E-mail (E-posta):** dtekyol34@hotmail.com

Submitted Date (Başvuru Tarihi): 16.09.2018 **Accepted Date (Kabul Tarihi):** 06.10.2018

Copyright 2020 Haydarpaşa Numune Medical Journal

OPEN ACCESS This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).



136/84 mmHg; 96pulses/minute). On pulse oximetry, he had a saturation of 88% on room air. Clinical examination was conducted following Advanced Trauma Life Support principles. He had no cranial trauma and all extremities were intact. Breath sounds were bilaterally decreased with crepitus in the chest wall and abdominal examination was normal. The initial radiological assessment (chest, abdomen, pelvic and spinal Ct scans) revealed bilateral pneumothoraces, contusion in the right lung, multiple fractures in posterior of ribs bilaterally, fracture in left scapulae and transverse processes of right 3rd and 4th vertebrae (Fig. 1). Bilateral tube thoracostomy was inserted urgently in Emergency Service with marked improvement in respiratory parameters and saturation increased to 94% on room air. Both chest tubes were inserted from the anterior axillary line in 5th intercostal space. Analgesia was provided by infusion of fentanyl (0.05 mg) and local anesthetic (Lidocaine) during tube thoracotomy. Nasal oxygen is given continuously and Cephazolin (i.v.) used for prophylaxis. After completing the examinations and consultations, the patient was transferred to the "Thoracic surgery" department. Radiographic evaluation (CXR post chest tube placement) revealed complete resolution of the air space bilaterally (Fig. 2). This allowed early chest physiotherapy, early mobilization and helped prevent hypoventilation and sputum retention. The chest tube was removed on day three and the patient was discharged home on day five. Chest x-rays and CT scans are shown below. Post-operative recovery was uneventful and the patient was discharged from the hospital day on day seven.

Discussion

Rib fractures and pneumothorax are the most common chest injuries in blunt traumas [1, 2]. Although the majority of patients with blunt chest injury could be treated without major surgical operations, more than half of them requires chest tube thoracotomy. Surgical treatment for chest wall stabilization or hemothorax evacuation is only required in a small percentage of patients with blunt chest trauma [2]. Proper management of blunt chest trauma with timely chest tube thoracotomy is considered, whenever necessary, optimal pain control and chest physiotherapy result in a good outcome in the majority of patients. However, observation is possible for selected patients without respiratory disease or the need for positive pressure ventilation presenting with small unilateral pneumothoraces.

Clinical symptoms are not considered an accurate predictor of outcome in blunt trauma. Pneumothorax, hemothorax and even pressure pneumothorax cannot be considered as negative prognostic factors in causing mortality alone

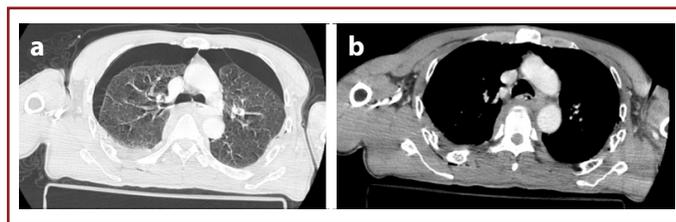


Figure 1. (a) Computed tomography scan of the chest showing. (b) Bilateral multiple rib fractures. Bilateral hemopneumothorax and multiple lung contusions, especially on the right.

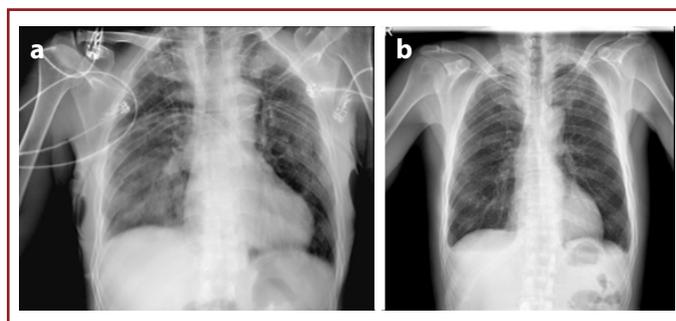


Figure 2. (a) X-ray taken after tube thoracostomy was inserted. (b) X-ray taken after 17 days discharged. Multiple rib fractures, subcutaneous emphysema, multiple lung contusions, particularly on the right.

after being diagnosed and successfully treated [3]. Major thoracic vessel injuries (AIS >5), bilateral lung contusion, bilateral flail chest, structural heart injury (AIS >3), several extrathoracic factors (age, blood transfusion, systolic blood pressure and extrathoracic severe injuries are also predictive of increased mortality [3]. The risk factors for mortality in patients sustaining blunt chest trauma are a patient age of 65 years or more, three or more rib fractures, presence of pre-existing disease (especially cardiopulmonary disease) and development of pneumonia post-injury [4,5]. Previous studies report about a mortality rate of 20% in patients sustaining a blunt thoracic injury. Mortality rates in poly-trauma patients with blunt chest trauma did not correlate with the severity of chest injury but rather with the severity of associated head injuries.

The use of computed tomography (CT) scans in trauma patients is emerging in the last decades with recent evidence hinting at a benefit in early survival after initial use of CT [6]. The use of CT for the evaluation of patients with blunt chest trauma has been common in practice for 20 years and yields more diagnoses than common chest x-rays [7,8]. As CT scans become cheaper and more commonly used in trauma, even small pneumothoraces will be diagnosed. The method to be used in the treatment of the detected pneumothoraces will be determined according to the clinic

of the patient. Traditional approaches to the diagnosis and management of rib fractures and pneumothorax are being challenged, and physicians should keep an open mind regarding new approaches to this condition.

The patient with severe thoracic injuries must be managed in the "Emergency Department" and surgical teams and interventions are dictated by the resuscitation protocol of department. Only early diagnosis, based on a high index of suspicion, clinical symptoms, diagnostic imaging and adequate surgical management, increased the chance of survival and led to excellent results.

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

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Concept: D.T.; Design: U.G.O.; Data Collection or Processing: D.T.; Analysis or Interpretation: H.T.; Literature Search: N.M.H.; Writing: I.A.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Ahmad MA, Delli Sante E, Giannoudis PV. Assessment of severity of chest trauma: Is there an ideal scoring system? *Injury* 2010;41:981–3. [\[CrossRef\]](#)
2. Barry R, Thompson E. Outcomes after rib fractures in geriatric blunt trauma patients. *Am J Surg* 2018;215:1020v3. [\[CrossRef\]](#)
3. Huber S, Biberthaler P, Delhey P, Trentzsch H, Winter H, van Griensven M, et al. Predictors of poor outcomes after significant chest trauma in multiply injured patients: a retrospective analysis from the German Trauma Registry (Trauma Register DGU®). *Scand J Trauma Resusc Emerg Med* 2014;22:52. [\[CrossRef\]](#)
4. Battle CE, Hutchings H, Evans PA. Risk factors that predict mortality in patients with blunt chest wall trauma: A systematic review and meta-analysis. *Injury* 2012;43:8–17. [\[CrossRef\]](#)
5. Chrysou K, Halat G, Hokschi B, Schmid RA, Kocher GJ. Lessons from a large trauma center: impact of blunt chest trauma in polytrauma patients—still a relevant problem? *Scand J Trauma Resusc Emerg Med* 2017;25:42. [\[CrossRef\]](#)
6. Oikonomou A, Prassopoulos P. Ct imaging of blunt chest trauma. *Insights Imaging* 2011;2:281–95. [\[CrossRef\]](#)
7. Akgul Ozmen C, Onat S, Aycicek D. Radiologic findings of thoracic trauma. *Ther Clin Risk Manag* 2017;13:1085–9. [\[CrossRef\]](#)
8. Schellenberg M, Inaba K, Bardes JM, Orozco N, Chen J, Park C, et al. The Combined Utility of EFAST and CXR in Blunt Thoracic Trauma. *J Trauma Acute Care Surg* 2018.