

## CASE REPORT

# Post-Traumatic Pulmonary Pseudocyst following Blunt Chest Trauma; a Case Report

Nasim Ghafourian<sup>1</sup>, Fatemeh Mahdizadeh<sup>1\*</sup>, Mina Zavareh<sup>2</sup>, Mitra Ahmadi<sup>2</sup>, Mohammad Hossein Askarzadeh<sup>3</sup>, Fatemeh Jalili<sup>4</sup>

1. Department of Emergency Medicine, Imam Khomeini Hospital, Ilam University of Medical Sciences, Ilam, Iran.

2. Department of Emergency Medicine, Pastornou Hospital, Tehran, Iran.

3. Department of Emergency Medicine, Afshar Educational Hospital, Yazd University of Medical Sciences, Yazd, Iran.

4. Department of Emergency Medicine, Hasheminejad Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

Received: April 2018; Accepted: May 2018; Published online: 1 May 2018

**Abstract:** Traumatic pulmonary pseudocyst is a rare complication of chest trauma that has been poorly documented and usually resolves without specific treatment. Here, we present a case of pulmonary pseudocyst in a child with chest trauma without obvious symptoms. It is important to consider this diagnosis in patients with chest trauma to avoid unnecessary invasive procedures.

**Keywords:** Thoracic injuries; contusions; wounds, nonpenetrating; Chest trauma; pulmonary pseudocyst; pulmonary contusion

© Copyright (2018) Shahid Beheshti University of Medical Sciences

**Cite this article as:** Ghafourian N, Mahdizadeh F, Zavareh M, Ahmadi M, Askarzadeh M, Jalili F. Post-Traumatic Pulmonary Pseudocyst following Blunt Chest Trauma; a Case Report. *Emergency*. 2018; 6 (1): e29.

## 1. Introduction

Traumatic pulmonary pseudocyst (TPP) is a rare complication of chest trauma that has been poorly documented and rarely talked about (1, 2). It can occur at any age, but is more often seen in children and young adults (3-5). These patients may be asymptomatic with unremarkable examination findings (5, 6). This report presents a case of pulmonary pseudocyst in a child with chest trauma without obvious symptoms.

## 2. Case report

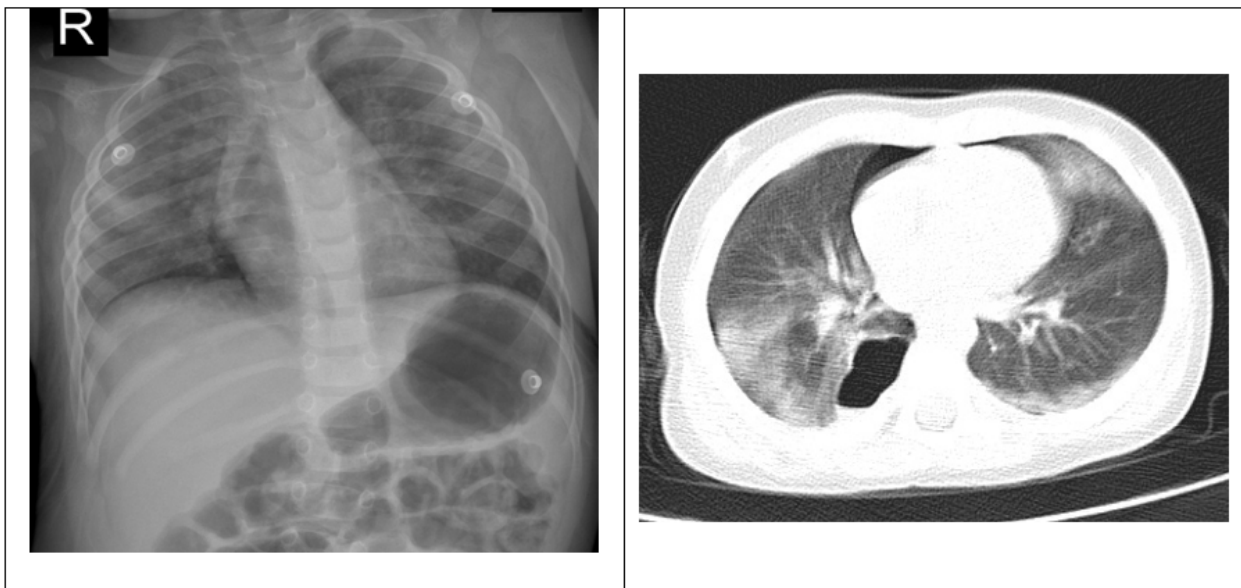
A 16 month boy was brought to the emergency department who was run over by a car. His mother explained that the child's chest was trapped under the rear of a reversing car. On arrival, he was uncomfortable and during examination was irritable. On physical examination, he was hemodynamically stable and well perfused but oxygen saturation was %85 in room air. The physical examination was unremarkable.

There wasn't significant respiratory distress or any bruising or laceration on chest wall. Chest was clear to auscultation. No other abnormalities were noted in the remainder of the physical examination. The patient was in usual state of health prior to the accident. His past history and family history were normal and he was not on any medication. His growth and development were also normal.

No evidence of free fluid was found in focused assessment sonography of trauma that was performed by an emergency medicine specialist. A chest X-ray was done in supine position in the emergency department, which was subsequently followed by computed tomography (CT) scan of the chest (figure 1). Chest radiography showed bilateral homogenous opacity. CT scan of the chest revealed bilateral parenchymal contusion, low-percentage pneumothorax, a rib fracture, and an oval cavity lesion with an air-fluid level in the basal segment in lower lobe of the right lung. This sub-pleural cavity measured 28 mm (height) and 14 mm (width) in size. There weren't any pathologic findings in spiral brain CT scan. Total leukocyte counts were mildly raised (12900 per mm<sup>3</sup> with %64 polymorphonuclear leukocytes). No biochemical abnormalities were revealed. There was no weight loss, lymphadenopathy or clubbing of fingers. He had no known exposure to tuberculosis and no known pulmonary disease.

\* **Corresponding Author:** Fatemeh Mahdizadeh; Department of Emergency Medicine, Imam Khomeini Hospital, Ilam, Iran. Tel: +989125497734 Email: mahdizadeh\_fatemeh@yahoo.com





**Figure 1:** Anterior posterior chest radiograph (left) and axial chest computed tomography (right) at the time of admission.



**Figure 2:** Anterior posterior chest radiograph on day 3.

There was no associated cough, fever, expectoration, hemoptysis or breathlessness, which clinically ruled out an infective process. With no evidence of underlying infection and given the clinical scenario, the diagnosis of TPP was made.

Pulse oximetry of the patient was monitored continuously. He was treated with oxygen via inhalation (3 liters per minute) and a general surgeon was consulted. Oxygen saturation was %97 while receiving oxygen.

The patient was moved to the intensive care unit. He was observed. He was comfortable with no new problem. On the third hospital day the chest radiograph showed appreciable reduction in contusion without pneumothorax or significant

cavity (figure 2). The patient remained asymptomatic during the hospital stay so he was discharged from the hospital on the next day without any antibiotics, emergency intervention, and additional surgical processes, thus confirmed our diagnosis of TPP. Surgeon advised his mother to follow up in clinic. There was no problem after one month.

### 3. Discussion

The incidence of TPP has been reported as approximately 3% after blunt chest injuries and was higher in younger patients and usually occurred following high speed motor vehicle accidents or fall. It has also been reported after penetrating chest injury (6-10). In Iran, one case that presented with multiple bilateral cysts has been reported (2).

TPP manifestations with minor clinical and major radiological signs like the case of this study have been recorded in the literature. Patients may be asymptomatic or associated with hemoptysis, cough, dyspnea, chest pain, fever and mild leukocytosis usually within the first 24 hours or up to fourteen days after injury (4-6). Physical examination findings are unremarkable and are usually restricted to crackles on the affected chest (5).

TPPs are air-filled or fluid-filled cavities with no true epithelial lining and their size ranges from 2 to 14 cm in diameter (4, 10). Most reported cases of TPPs have had concurrent lung injuries such as pulmonary contusion, hematoma, hemothorax, and pneumothorax (5).

Two mechanisms have been suggested for TPP formation: compression and decompression result in barotraumas and ruptured parenchyma. Retraction of normal elastic lung tis-

sue from contusion forms cavities filled with air and/or fluid. Also, air from a compressed part of the lung cannot escape fast enough due to closure of the glottis or an obstructed bronchus. Higher chest wall compliance and elasticity in children and young adults leads to increased transmission of forces and formation of TPP (9-11). Diagnosis is made based on radiographic features and a history of chest trauma. TPP typically follows a benign clinical course and is treated conservatively (12). TPPs may be identifiable on chest radiography but CT is more valuable for early diagnosis (9). They may be single or multiple and unilateral or bilateral. They may be seen on the site of injury or on the opposite side secondary to counter coup effects, which are usually sub-pleural lesions commonly found in the lower lobes. Unlike other cystic lesions and cavities, the size, shape, and nature of wall of TPPs change relatively quickly (13-15). In this case, the cavity was approximately 3 cm and had an air-fluid level.

Differential diagnoses include post pneumonia carcinoma, pneumatocele, tuberculosis, lung abscess, bronchogenic cysts and pulmonary sequestration. Most of these lesions are self-limiting and benign lesions that don't require specific treatment, yet the clinical course might be complicated due to infection and bleeding (10, 16). Surgical intervention is recommended only when complications such as infection, bleeding and rupture develop (12). TPPs mostly need conservative management unless complications arise. The use of antibiotics is controversial and not routine (4, 6). Resolution usually occurs within a few weeks to a few months. If the cavity lesion does not decrease with time other etiologies must be considered.

This patient was treated conservatively without antibiotic therapy. He was asymptomatic and was discharged on day 4 of hospitalization without complications and thus confirmed our diagnosis of TPP.

#### 4. Conclusion:

TPP is an uncommon complication of chest trauma. Often no specific treatment is needed. TPP should be considered in the differential diagnosis of cystic or cavitory lung lesions following significant blunt trauma, particularly in younger patients, to prevent unnecessary and invasive procedures.

### 5. Appendix

#### 5.1. Acknowledgements

The authors would like to thank the emergency ward staff.

#### 5.2. Authors contribution

All authors passed four criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

#### 5.3. Conflict of interest

None.

#### 5.4. Funding

None.

### References

1. Cho HJ, Jeon YB, Ma DS, Lee JN, Chung M. Traumatic pulmonary pseudocysts after blunt chest trauma: Prevalence, mechanisms of injury, and computed tomography findings. *Journal of Trauma and Acute Care Surgery*. 2015;79(3):425-30.
2. Rahimi-Rad M, Mohammadi A. Multiple bilateral traumatic pulmonary pseudocysts in a 53 year-old male diagnosed retrospectively. *Pneumologia (Bucharest, Romania)*. 2010;59(2):84-6.
3. Das S, Cherian S, Bisen N, Hamarneh W, Lenox R. Pulmonary cystic lesions post motor vehicle accident: a rare occurrence. *QJM: An International Journal of Medicine*. 2012;106(6):581-2.
4. Gupta N, George J, Gupta RC, Dixit R. Traumatic pulmonary pseudocyst. *International journal of critical illness and injury science*. 2013;3(2):155.
5. De Dios JAA, Paoletti L, Bandyopadhyay T. AN UNUSUAL CYSTIC LUNG LESION. *Chest*. 2008;134(4):32C.
6. Yazkan R, Ozpolat B, Adahinalp AS. Diagnosis and management of post-traumatic pulmonary pseudocyst. *Respiratory care*. 2009;54(4):538-41.
7. Fagkrezos D, Giannila M, Maniatis P, Papailiou J, Triantopoulou C. Post-traumatic pulmonary pseudocyst with hemopneumothorax following blunt chest trauma: a case report. *Journal of medical case reports*. 2012;6(1):356.
8. El-Hag-Aly MA, Allam HK. Fate of traumatic pulmonary pseudocyst: factors of resolution. *Asian Cardiovascular and Thoracic Annals*. 2015;23(2):176-9.
9. Cheung N, James A, Kumar R. Large traumatic pneumatocele in a 2-year-old child. *Case reports in pediatrics*. 2013;2013.
10. Cherian SV, Das S, Basu BD, Geethakumari PR. Traumatic Pulmonary Pseudocyst. *Internal Medicine*. 2013;52(12):1429-30.
11. Ahmad Z, Pandey D, Hasan A, Anis A. Trauma: an unusual aetiology of pulmonary pseudocyst. *INDIAN JOURNAL OF CHEST DISEASES AND ALLIED SCIENCES*. 2008;50(3):293.
12. Yang P-J, Tsai I-T, Liu T-H. Traumatic pulmonary pseudocyst. *The Journal of pediatrics*. 2015;167(3):777-. e1.
13. Luo L, Yin L, Liu Z, Xiang Z. Posttraumatic pulmonary pseudocyst: computed tomography findings and man-



- agement in 33 patients. *Journal of Trauma and Acute Care Surgery*. 2012;73(5):1225-8.
14. Weihua Z, Yanhong T, Hongwei L, Qiong L, Dihong W. Traumatic Pulmonary Cyst in 6 Cases of CT Performance Analysis. *Journal of Yangtze University (Natural Science Edition)*. 2012;11:011.
  15. DING C-q, SUN Y-y, DING A-l, ZHANG Y-n, WANG W-s, WANG C. CT Dynamic Analysis of Multiple Traumatic Pulmonary Pseudo-cysts [J]. *Computerized Tomography Theory and Applications*. 2013;1:023.
  16. Ulutas H, Celik M, Ozgel M, Soysal O, Kuzucu A. Pulmonary pseudocyst secondary to blunt or penetrating chest trauma: clinical course and diagnostic issues. *European Journal of Trauma and Emergency Surgery*. 2015;41(2):181-8.

