Late Onset Isolated Traumatic Pneumomediastinum in a Child: A Case Report

Çocukta Geç Tespit Edilen İzole Travmatik Pnömomediastinum: Olgu Sunumu

Çocukta Travmatik Pnömomediastinum / Traumatic Pneumomediastinum in a Child

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Özet

Pnömomediastinum (PM), mediasten içinde serbest hava veya gaz olması olarak tanımlanır. Pnömomediastinum, travmayla veya spontan olarak meydana gelebilir. Travmatik PM, sıklıkla künt toraks travması, kafa travması, endoskopi-bronkoskopi sonrasında (özefagus yırtılması, trakeobronşiyal yaralanma) ve mekanik ventilasyona bağlı olarak görülür. Künt travma sonrası PM, genellikle erişkinlerde, kosta kırığı, hemo-pnömotoraks ve torasik vasküler damar yaralanmalarıyla beraber görülen, yüksek enerjili travma sonrası oluşan ölümcül bir durumdur. Biz yazımızda, çocukta geç başlangıçlı travmatik PM olgusu sunduk ve bu ölümcül yaralanmanın acil serviste tanısının zorluk ve önemini vurguladık.

Anahtar Kelimeler

Travma; Pnömomediasten; Çocuk; Geç Tanı

Abstract

Pneumomediastinum (PM) is defined as the presence of gas or free air in mediastinum. Pneumomediastinum may ocur either by trauma or spontaneously. Traumatic PM is frequently seen after blunt thoracic trauma, head trauma, after endoscopy-bronchoscopy (osephagus perforation, tracheobronchial injury) and due to mechanical ventilation. Pneumomediastinum after blunt trauma is a lethal injury that generally occurs in adults with concomittant injuries such as rib fractures, hemo-pneumothorax and thoracic vascular injuries after high-energy traumas. We represent case report of a late onset isolated traumatic PM in a child and aim to underline the difficulty and importance of diagnosis of this lethal injury in the emergency department.

Keywords

Trauma; Pneumomediastinum; Child; Late Detection

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Introduction

Traumatic pneumomediastinum (PM) has been reported up to 10% of patients who have sustained severe blunt thoracic trauma. It is a relatively uncommon injury after trauma to the neck, thorax, or abdomen but may be a significant cause of morbidity and mortality in affected individuals because of the associated damage to the esophageal, and tracheabronchial, or vascular thoracic structures [1,2,3]. In this report, we represent you a 15-year-old male patient with isolated traumatic PM whose initial computerized tomography (CT) scan was normal.

Case Report

After a motorcycle accident, a 15-year-old boy was brought to our emergency department (ED). According to the anamnesis, he has lost the control of the vehicle and fallen from it. On admission, his vital signs were normal, he had a clear consciousness and had no sign of trauma on his body in inspection. On physical examination, no abnormalities were determined. His blood and urine samples were taken, standart X-ray imaging for trauma was performed and, to exclude a possible occult injury due to high energy trauma, brain, cervical, thorax and abdomen CT scannings were performed in order to determine possible fatal injuries. After evaluation of the X-ray and CT scan images (fig. 1), they were all reported as normal. Also no abnormalities

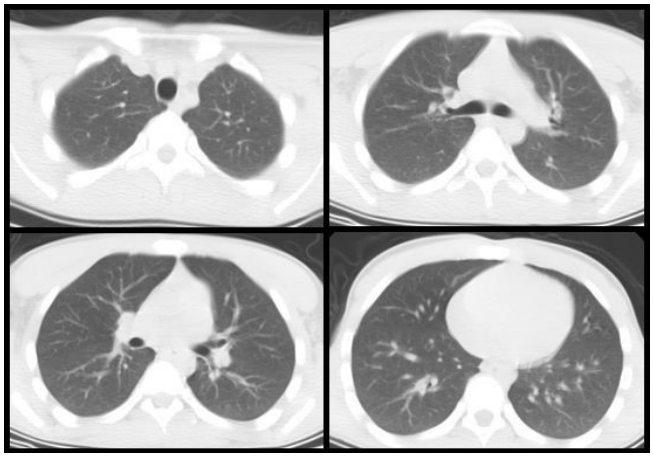


Fig 1. A normal CT scan of the patient on admission (parenchymal window).

were determined in laboratory studies except an elevated muscle enzyme creatine kinase (CK). It was high due to trauma and its level was 481 U/L (0-171). After a 9-hour follow-up in the emergency observation room, no reduction in hemoglobin levels which were taken every 3 hours was determined. No changes in mental status and vital signs were observed in the follow-up period. Patient was discharged from ED without any complaints. The next day, the same patient was admitted to the ED for a mild pain on chest while breathing. The vital signs and physical examination were normal. His recent CT scan was evaluated again for a missed hemopneumothorax or pneumomediastinum and reported as normal again.

In second admission, patient had a chest radiograph abdominal ultrasonographic examination and a subsequent chest CT scan as part of the initial diagnostic assessment for a possible late onset of intraperitoneal hemorraghe, traumatic hemothorax, pneumuthorax or pneumomediastinum. Free air images are observed around esophagus and vascular structures (fig. 2). Patient was consultated with pediatric surgery and thoracic surgery and transferred to an advance center treatment of PM. He was hospitalized with esophagus rupture prediagnosis. After a follow-up of 7 days, pneumomediastinum regressed in control CT images and the patient was discharged with total cure.

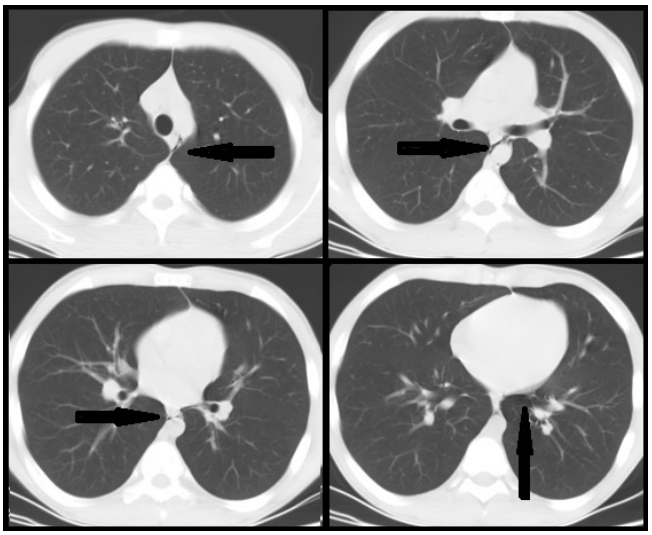


Fig 2. A CT scan of the patient on secondary admission (parenchymal window). Black arrows demostrate air leak in paraosephageal region in middle and upper mediastinum which is correlated with pneumomediastinum

Discussion

Pneumomediastinum is defined as the presence of gas or free air in mediastinum. Pneumomediastinum may occur either by trauma or spontaneously. Traumatic PM is frequently seen after blunt thoracic trauma, head trauma, after endoscopy-bronchoscopy (osephagus perforation, tracheobronchial injury) and due to mechanical ventilation [4]. Pneumomediastinum has been reported in up to 10% of patients who have sustained severe blunt thoracic trauma and may be a significant cause of morbidity and mortality in affected individuals because of the associated damage to the esophagus or trachea [1,2]. Intrathoracic perforation of the esophagus from blunt trauma is extremely rare in children and often occurs in adults as a result of high-speed motor vehicle accidents. Possible mechanisms of esophageal rupture from blunt trauma are as follows; rapid rise in intraluminal pressure against a closed glottis resulting in disruption of the wall of of the esophagus, disruption of the esophageal blood supply by deceleration-traction injury producing ischemia leading to rupture, and “blast effect” disruption of the esophagus produced by a concomittant tracheal injury in cases of combined tracheal and esophageal trauma [5]. There is another theory for delayed onset PM after blunt trauma. According to this theory, ischemic injury secondary to deceleration that disrupts the segmental arterial supply and leads to a delayed perforation [6]. Even though the time is quite short, this theory may explain the delayed onset in our case.

Traumatic PM secondary to blunt chest injury is concerning for potential life-threatening tracheobronchial, esophageal or vascular thoracic injuries. In a study with 193 patients by Step et al., it was reported that all patients with traumatic PM had significant thoracic injuries (e.g., rib fractures, and hemothorax), which would have been evident on X-ray [7]. In a study, it was reported that PM was associated with other thoracic inju-

ries such as tracheobronchial lacerations, pneumothoraces and pulmonary contusions [5]. In our case, there were not any concomittant injuries. An isolated traumatic PM was determined. Besides, our case occured in an unusual age group as PM is frequently seen in adults after high energy trauma.

Esophagography is the initial method of choice in the evaluation of esophageal lesions. Paraosephageal manifestations of esophageal rupture may be defined by thoracic CT. We chose to use CT technique in our case. On admission CT was totally normal but on the other day, when patient visited our ED, PM was defined with control CT. At the advanced center, CT after oral contrast was also performed but no leak of contrast could be observed. It was reported before that it is not always possible to determine the exact location of the rupture with radiological studies after contrast [8].

Traumatic PM may be treated by several ways. Non operative treatment is an option and other options are primary repair, esophagectomy, and exclusion and diversion. Delayed diagnosis and treatment markedly increases the morbidity and mortality particularly in adults [5]. Our case was treated non operatively and a total cure was obtained.

Conclusion

Pneumomediastinum after blunt trauma usually ocur in adults with concomittant lethal injuries after high-energy traumas such as motor vehicle accidents. Methods of diagnosis and treatment may vary. Diagnosis is relatively difficult due to accompanying radiological findings which may distract the physician. A good follow-up may reduce the risk of missing the diagnosis. In this report, we presented a child with isolated late-onset PM after blunt trauma and aimed to underline the importance of this lethal finding which can be easily misdiagnosed, particularly when ocur unaccompanied.

Competing interests

The authors declare that they have no competing interests.

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