

Mediastinal and subcutaneous emphysema after manual strangulation

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ABSTRACT

Pneumomediastinum is a disease characterized by the presence of air in the mediastinum. The disease is examined in two categories as spontaneous and secondary and frequently seen as a result of traumatic causes. In our study, we present a case of diffuse mediastinal and subcutaneous emphysema after strangulation, unrelated to penetrating injury. After detailed anamnesis, it was understood that it was not a simple penetrating injury but a complicated trauma. Anamnesis, clinical findings, and radiology should be compatible with each other. When necessary, detailed anamnesis should be insisted and the etiology of blunt trauma should be investigated, especially if mediastinal emphysema is detected. Complications such as tension pneumomediastinum, pneumopericardium, and mediastinitis can be seen which complicates the disease and can result in death.

Key words: Blunt trauma, Mediastinal emphysema, Penetrating trauma, Pneumomediastinum, Subcutaneous emphysema

Pneumomediastinum, also called mediastinal emphysema, is characterized by the presence of air in the mediastinum [1]. It is examined in two groups as secondary and spontaneous. The causes such as asthma, vomiting, Valsalva maneuver, drugs, exercise, and severe cough are known to be associated with spontaneous pneumomediastinum. Secondary pneumomediastinum occurs due to traumatic and iatrogenic causes [2]. Here, we present the case of diffuse mediastinal and subcutaneous emphysema after strangulation, unrelated to penetrating injury. It has been presented due to its rarity, the coexistence of penetrant injury and strangulation, the absence of physical examination findings of strangulation, and the importance of detailed anamnesis.

CASE REPORT


A 17-year-old female patient presented with complaints of severe chest pain and shortness of breath after a lateral penetrating injury to the left hemithorax. The general condition of the patient was good with stable vital signs. Physical examination detected at the left lateral level of the seventh rib, a well-circumscribed penetrating injury area of approximately 1.5 cm which was not associated with the thorax (Fig. 1a) (sutured after examination), and subcutaneous emphysema starting from the submental area which is prominent in the left lateral of the neck, and diffuse

subcutaneous emphysema in the antesternal area in the left hemithorax and in the right hemithorax (Fig. 1b).

Laboratory investigation detected white blood cells (WBCs) 18,600 μ L, hemoglobin 14.3 g/dL, and C-reactive protein (CRP) 48 mg/dL. Computed tomography (CT) examination was performed to investigate the etiology of emphysema and the relation of penetrating injury with organs. In CT, there was no intra-abdominal pathology, but diffuses subcutaneous emphysema and mediastinal emphysema (Fig. 2). Penetrating injury was not associated with the thorax (for no pneumothorax or hemothorax).

Since the clinical and radiological findings were in consistent with the anamnesis; the patient was reinterviewed for a detailed anamnesis. It was perceived that she was choked in the neck, struck to the right hemithorax, fell, hit a hard surface, and was exposed to the blunt trauma, followed by a penetrating injury. No pathological findings were found in the spinal cord and vertebrae. No mucosal damage was reported on pharyngeal examination. It was evaluated normal up to the esophagus cardia level on endoscopy and trachea bilateral bronchial branches as normal in bronchoscopy.

The patient was hospitalized with a diagnosis of traumatic mediastinal emphysema, oral nutrition was stopped, and total parenteral nutrition was provided. Prophylactic antibiotics were given for mediastinitis and inhaler oxygen support was provided for air resorption. After oral nutrition on the 3rd day of hospitalization, WBCs (18600 μ L), CRP (48 mg/dL), and

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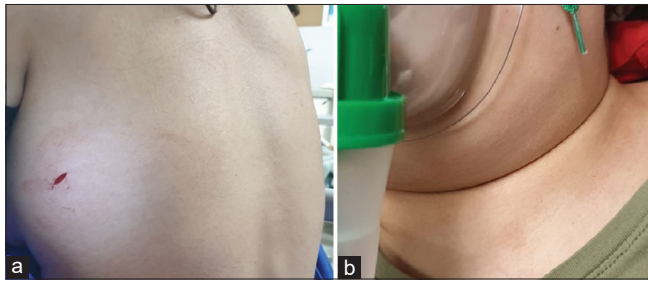


Figure 1: (a) Penetrating injury image in the left hemithorax lateral; (b) subcutaneous emphysema image on the neck

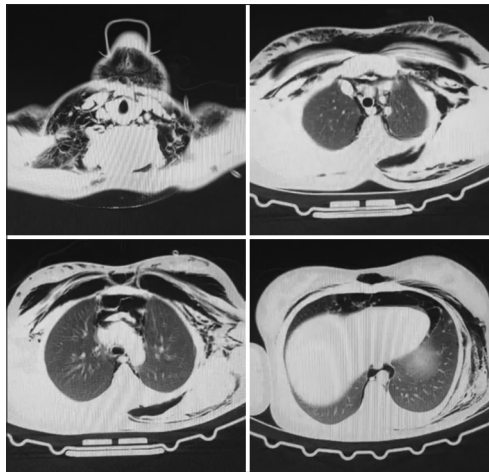


Figure 2: Computed tomography image of mediastinal and subcutaneous emphysema

hemoglobin values (14.3 g/dL) were seen to be stabilized. The chest radiography showed that emphysema was resorbed, and the lung was fully expanded. On the 5th day of her hospitalization, the patient was discharged with full recovery by recommending outpatient clinic control (Fig. 3).

DISCUSSION

Pneumomediastinum is also called mediastinal emphysema. Unless it is directly associated with mediastinum, pneumomediastinum is not seen in penetrating injuries. Therefore, it is not spontaneous and must be caused by secondary causes. Usually, it is due to pathological reasons such as damage to the aerodigestive system, trauma, or surgery history [3].

Facial and cervical petechiae and ecchymoses are a common injury pattern found in strangulation injuries [4]. In our case, although there was no finding compatible with blunt trauma on physical examination, a detailed anamnesis was required due to clinical incompatibility.

The most common mechanism of pneumomediastinum in patients occurs with blunt trauma [5]. As seen in our case, chest pain and shortness of breath are the most common symptoms in mediastinal emphysema. Palpable crepitus and subcutaneous emphysema represent common findings [6]. As a result of the evaluations, it was perceived that the case endures not a simple penetrating injury, but a mixed injury with blunt and penetrating injury. Mediastinal emphysema occurs due to

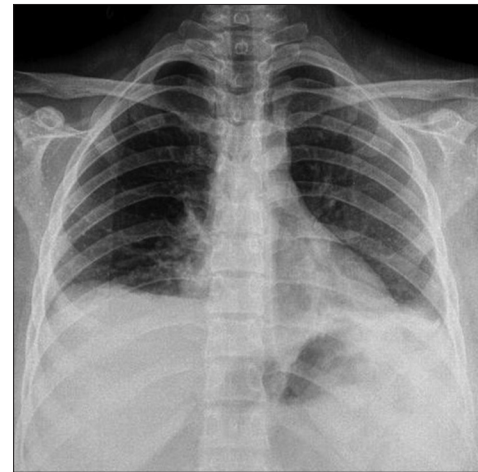


Figure 3: Control chest radiography

alveolar rupture after a sudden increase in the intrathoracic pressure, with bronchovascular tissue and air leakage into the mediastinum [7].

Bronchoscopy and/or esophagoscopy should be performed when the appropriate indication for possible tracheal or esophageal injury exclusion. Unless there is a pathological finding such as rupture, generally conservative and symptomatic treatment is followed, although controversial treatment is sufficient [8]. In manual strangulation, blood vessels and trachea can be blocked due to the pressure affected to the neck [9]. However, no skin findings were observed in our case.

Attention should be given to the complications such as tension pneumomediastinum, pneumopericardium, and mediastinitis. Prophylactic antibiotic treatment should be given to all patients with aerodigestive system injuries due to the risk of mediastinitis [10]. In case of indication, subcutaneous and mediastinal emphysema drainage, and if necessary, mediastinotomy, or thoracic surgery methods should be applied.

CONCLUSION

Mediastinal emphysema is frequently associated with blunt trauma. Clinical findings and radiological imaging complement each other. If inconsistency or an unexplained finding is detected, detailed anamnesis should be insisted.

REFERENCES

1. Kouritas VK, Papagiannopoulos K, Lazaridis G, Baka S, Mpoukovinas I, Karavasili V, *et al.* Pneumomediastinum. *J Thorac Dis* 2015;7:S44-9.
2. Potz BA, Chao LH, Ng TT, Okereke IC. Clinical significance of spontaneous pneumomediastinum. *Ann Thorac Surg* 2017;104:431-5.
3. Sapmaz E, Işık H, Doğan D, Kavaklı K, Çaylak H. A comparative study of pneumomediastinum based on clinical experience. *Ulus Travma Acil Cerrahi Derg* 2019;25:497-502.
4. Dunn RJ, Sukhija K, Lopez RA. *Strangulation Injuries*. Treasure Island, FL: Stat Pearls Publishing; 2021.
5. Banki F, Estrera AL, Harrison RG, Miller CC, Leake SS, Mitchell KG, *et al.* Pneumomediastinum: Etiology and a guide to diagnosis and treatment. *Am J Surg* 2013;206:1001-6.
6. Sahni S, Verma S, Grullon J, Esquire A, Patel P, Talwar A. Spontaneous

- pneumomediastinum: Time for consensus. N Am J Med Sci 2013;5:460-4.
7. Caceres M, Ali SZ, Braud R, Weiman D, Garret Jr HE. Spontaneous pneumomediastinum: A comparative study and review of the literature. Ann Thorac Surg 2008;86:962-6.
 8. Takada K, Matsumoto S, Hiramatsu T, Kojima E, Watanabe H, Sizu M, *et al.* Management of spontaneous pneumomediastinum based on clinical experience of 25 cases. Respir Med 2008;102:1329-34.
 9. Banwari ML. A case report on near manual strangulation and glasgow coma scale. Afr Health Sci 2015;15:1038-40.
 10. Gregory M, Roland B, Christian HN. Pneumomediastinum in blunt chest

trauma: A case report and review of the literature. Case Rep Emerg Med 2014;2014:685381.

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