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Emphysema of Multi-compartment in Asthmatic Patient: Subcutaneous, Mediastinal, Pericardial, and Spinal Pneumatosis

Astım Hastasında Multikompartman Amfizem: Subkutan, Mediastinal, Perikardiyal ve Spinal Pnömotosis

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ABSTRACT

Introduction: Varying degrees of emphysema can be seen in the acute phase of asthma due to increased intra-bronchial and intra-alveolar pressure induced by severe cough. Emphysemas can be simple subcutaneous to spinal pneumatosis.

Case Report: A male patient, aged 22, was admitted to the emergency service with complaints of dyspnea. He was in an acute asthmatic attack and had diffuse subcutaneous emphysema. Pneumatosis was localized in the base of skull, spinal canal, mediastinum, and pericardium. During his hospital stay, he was intubated, and tube thoracotomy was performed bilaterally at the intensive care unit. His bronchoscopy revealed no pathological findings. Anti-asthmatic treatment and antibiotic therapy were also administered, and the patient was discharged from the hospital on day 14 after admission.

Conclusion: The literature contains rare reports of acute asthmatic attacks and emphysemas, pneumomediastinum, and spinal pneumatosis, which are mostly isolated findings. The case reported in this paper should remind physicians that pneumatosis could be widespread among many different compartments at the same time, which can complicate the situation and require decompression together with anti-asthmatic treatment.

Keywords: Asthma, pneumatosis, pneumomediastinum, spinal pneumatosis, pneumopericardium

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ÖZET

Giriş: Ciddi öksürüğün tetiklediği artmış intrabronşial ve intraalveolar basınca bağlı olarak akut astım atağında değişen derecelerde amfizem görülebilir. Amfizem basit subkutandan spinal pnömotisise kadar olabilir.

Olgu Sunumu: 22 yaşında erkek hasta acil servisimize dispne şikayeti ile başvurdu. Akut astım atağında olan hastanın diffüz subkutan amfizemi vardı. Pnömotosisi kafatası bazali, spinal kanal, mediastinum ve perikardiyumda mevcuttu. Hastane yatış sürecinde yoğun bakım ünitesinde entübe edildi ve bilateral tüp torakostomi uygulandı. Bronkoskopi sonucunda patolojik bulgu saptanmadı. Ayrıca anti-astım ve antibiyotik tedavisi uygulanan hasta yatışının 14.gününde hastaneden taburcu edildi.

Sonuç: Literatür - çoğunlukla izole bulgular olarak - akut astım ve amfizem, pnömomediastinum ve spinal pnömotosis ile ilgili nadir vaka raporları içermektedir. Bu yazıda sunulan vaka, acil hekimleri tarafından eş zamanlı olarak bir çok kompartmanda pnömotosis görülmesi açısından unutulmamalıdır ki; bu durum hastanın durumunu komplike eder ve anti astım tedavisinin yanında dekompresyon gerektirir.

Anahtar Kelimeler: Astım, pnömotosis, pnömomediastinum, spinal pnömotosis, pnömoperikardiyum

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Introduction

The presence of air in certain parts of the body such as the head and neck region, subcutaneous, spinal canal, mediastinum and pericardium implies pathological conditions. These conditions can have life-threatening impacts. Varying degrees of

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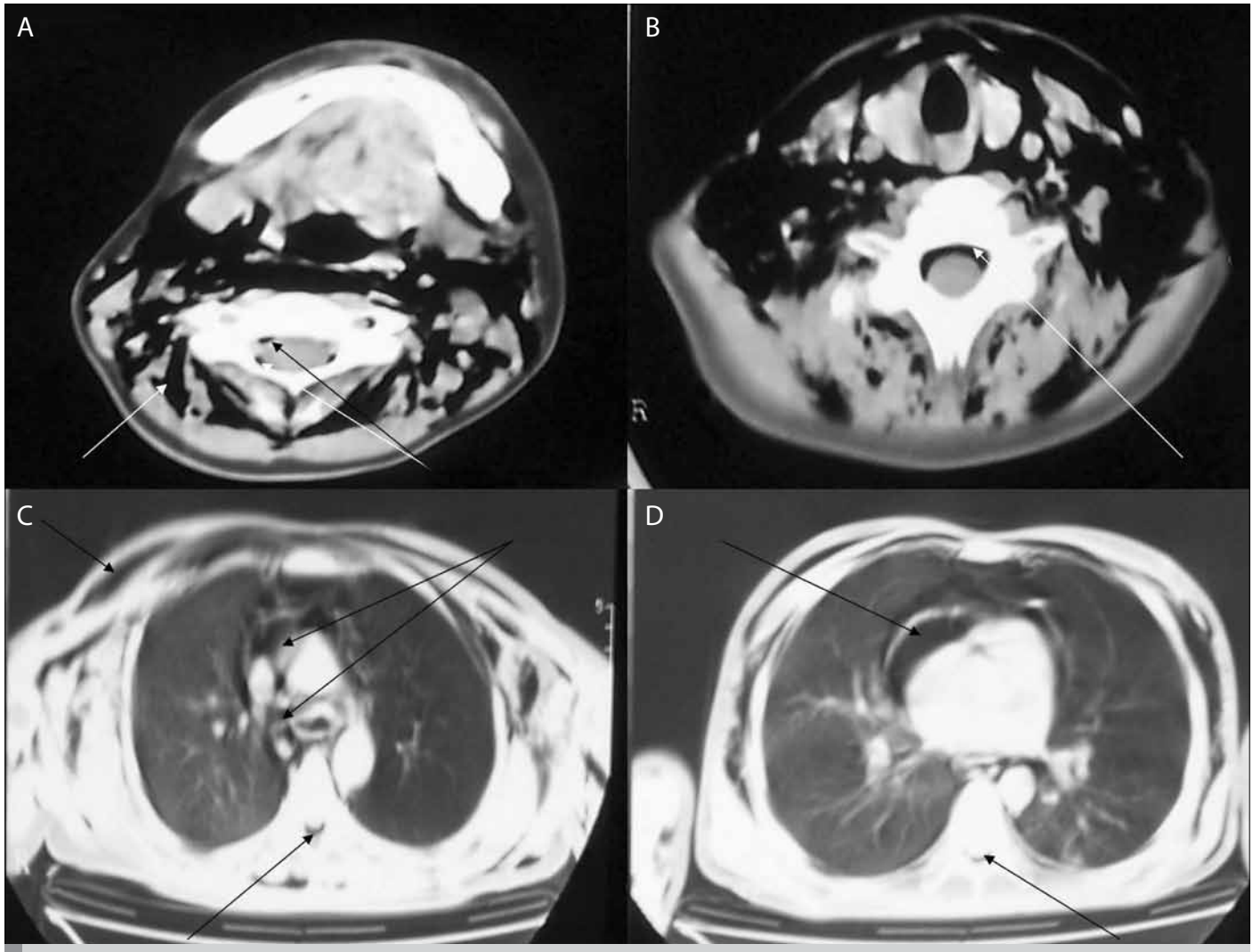

Figure 1. Diffuse subcutaneous emphysema and pneumatosis in the base of skull and spinal canal (A and B), pneumomediastinum (C), pneumopericardium (D)

emphysema may occur during asthma attacks (1). In this paper, we present a case with pneumatosis in different compartments of his body at the same time, which was related with severe asthmatic attacks.

Case Report

A 22-year-old male patient with history of asthma and diabetes mellitus admitted to emergency department with dyspnea, coughing and altered mental status. He had 38.9° C body temperature, 80/40 mmHg blood pressure and classical lung findings of asthma together with widespread crepitation by palpation. Oxygen saturation was 80% on pulse oxymeter. He was prone to sleep and had tachycardia, tachypnea and deep cardiac sounds. The cranial and chest computed tomography displayed extensive subcutaneous emphysema and air in the base of skull and along cervical, thoracic and upper lumber spinal channel, pneumomediastinum and pneumopericardium (Figure 1, A-D). His arterial blood gas analysis revealed hypoxemia, hypercarbia and respiratory acidosis (pO_2: 60 mmHg; pCO_2: 52 mmHg; oxygen saturation: 88%; pH: 7.28). Other findings except leukocytosis (18,000/μL; NR: ≤10.000) were in normal range. Although there was no pneumothorax, tube thoracostomy was performed bilaterally to treat pneumatosis within mediastinum and pericardium. Diagnostic fiberoptic bronchoscopy revealed no pathological findings. Anti-asthmatic treatment together with a wide spectrum antibiotherapy due to ventilator-associated pneumonia were performed at the intensive care unit. The signs of emphysema and lung infiltrations disappeared completely at day 10 and he was discharged at day 14 after his presentation.

Discussion

Pneumomediastinum is a rare complication in patients with asthma. Spontaneous pneumomediastinum is usually a benign condition where conservative treatment procedures are used for most patients. The clinical significance and its life-threatening potential depend on the presence of complications and underlying etiology.

In general, the mainstay of its treatment is the treatment of the underlying disease. Bed rest, oxygen therapy and analgesics are also recommended (1-4).

Pneumopericardium is also another rare condition, which can present secondary to many factors. While the trauma is the most common cause, adjacent organs affecting the pericardium is the second underlying cause (5). Mediastinum is associated with submandibular space, retropharyngeal space and vascular sheath. After the dissection of these spaces, free air goes through to the pericardium, and pneumopericardium develops. It is diagnosed by chest X-ray and computed tomography (6). Spontaneous regression can be expected in the absence of tension pneumopericardium. However, close clinical follow-up is essential. Serial chest X-rays can be used for radiological follow-up (7).

Intracranial air is serious a finding of trauma and other pathologies. Raising the head, hyperbaric oxygen therapy, prophylactic antibiotics, and analgesics are required in the treatment. The recovery usually begins within two weeks. However, surgical drainage and anti-edema treatment may be needed in the severe cases (8).

Spinal pneumatosis is associated with different conditions including trauma, lumbar puncture, pneumothorax, and pneumomediastinum. Mediastinal air can reach to the spinal canal because of low resistance of loose connective tissue along the neural foramen of intercostal nerves. Spinal air due to pneumomediastinum is a benign condition that doesn't require advanced research and treatments (9).

Subcutaneous emphysema can be spontaneous, traumatic or iatrogenic. Application in removal aberrant such as placing chest tube, massage of the tissue, inserting cutaneous intracath, wrapping the chest wall with elastic bandage, fasciotomy or mediastinotomy may be implanted (10).

Conclusion

The literature contains rare reports of acute asthmatic attacks and emphysemas, pneumomediastinum or spinal pneumatosis, which are mostly isolated findings. The case reported in this paper should remind the physicians that pneumatosis could be widespread among many different compartments at the same time, which can complicate the situation and require decompression together with anti-asthmatic treatment.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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