

Two unusual causes of a rare clinical entity: pneumomediastinum

Nadir görülen bir klinik tablonun iki alışılmadık nedeni: Pnömomediasten

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ABSTRACT

Pneumomediastinum is a rare clinical entity characterized by trapping of air in mediastinum. Conservative management is sufficient in majority of patients with pneumomediastinum. Herein we report two rare cases of pneumomediastinum that occurred after dental and aesthetic surgery. Since clinical courses of the two cases were divergent, one was treated conservatively while the other was treated surgically. Complete resorption of pneumomediastinum was detected during follow-up of both cases.

Keywords: Mediastinum; pericardium; pleura; pneumomediastinum.

Pneumomediastinum (PM) was originally described in 1819 by Laënnec and was defined as the entrapment of free air in the mediastinal cavity. It can be classified as spontaneous or idiopathic PM in which there is free air in the mediastinal cavity without a clear etiology or secondary or iatrogenic PM which occurs as a result of trauma, iatrogenic insults (endoscopic procedures, intubation, dental surgery), or other clinical conditions (parturition, intense vomiting, epileptic seizures, respiratory distress syndromes, barotraumas, asthma crises, or weightlifting).^[1,2] Usually PM subsides with symptomatic treatment after a few days without causing clinical deterioration. However, the spreading of larger volumes of air into deeper spaces may sometimes cause serious complications. Moreover, tension PM, which can be lethal, can sometimes occur. In this clinical entity, increased intramediastinal pressure leads to impaired central venous return through the cava system and the collapse of the cardiac chambers, resulting in reduced cardiac output.^[3] Herein, we report

ÖZ

Pnömomediasten havanın mediastende hapsolması ile karakterize, nadir görülen klinik bir tablodur. Pnömomediastenli hastaların büyük kısmında konservatif tedavi yeterlidir. Bu yazıda dental ve estetik cerrahi sonrasında nadir olarak gelişen iki pnömomediasten olgusu bildirildi. İki olgunun klinik seyirleri farklı olduğundan biri konservatif diğeri cerrahi şekilde tedavi edildi. Her iki olgunun takibinde pnömomediasteninin tam rezorpsiyonu saptandı.

Anahtar sözcükler: Mediasten; perikard; plevra; pnömomediasten.

on two rare causes of PM from each side of its clinical spectrum. The first case occurred after dental surgery and was managed conservatively, whereas the second case appeared after aesthetic surgery and was treated surgically.

CASE REPORT

Case 1- A 30-year-old otherwise healthy female was admitted to the emergency department with a swollen neck. It was revealed that she had undergone root canal restoration of her third right mandibular molar two hours earlier and that water and an air-turbine drill had been used during the procedure. A physical examination revealed slightly tender swelling with clear-cut crepitation on both sides of the neck. The initial diagnosis was angioedema associated with a local anesthetic agent that had been used during the dental surgery. Plain radiographs of the neck and a chest X-ray showed subcutaneous emphysema of the laterocervical and presternal areas (Figure 1a).



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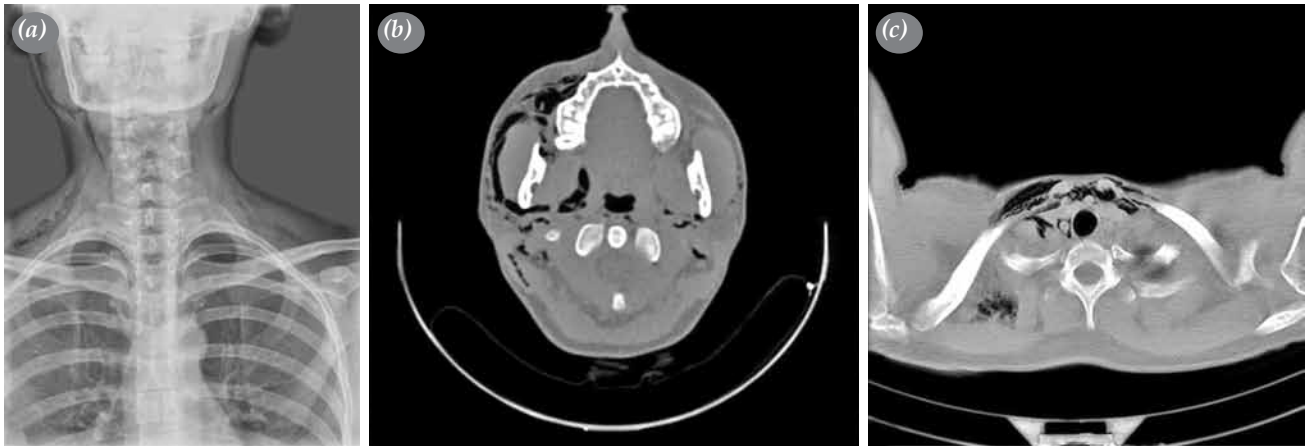


Figure 1. Plain radiographic image showing the subcutaneous emphysema (a) and computed tomography images showing the air entrapped in the right perimandibular space and superior mediastinum (b and c, respectively).

Therefore, additional computed tomography (CT) of the neck and thorax were obtained, which detected entrapped air in the deeper spaces, including the submaxillary area, retromandibular space, and superior mediastinum (Figures 1b, c). The patient was hospitalized and nasal oxygen, antibiotics, and analgesia were administered. Over the next four days, the swelling and crepitation around the neck gradually ceased, and she was discharged in good condition without any sequelae.

Case 2– A 24-year-old female was referred to us with progressive dyspnea, tachypnea, fever, tachycardia, and decreased oxygen saturation levels (SO₂: 75%). Her medical history revealed that she had undergone elective lipoabdominoplasty and mastopexy surgery 20 hours earlier. The procedure had been performed under general anesthesia and intubated with a 6.5 French (F) cuffed endotracheal tube without any difficulty. No complications had been encountered during the operation. A physical examination found that she was hypotensive (blood pressure: 80/50

mmHg) and that her heart sounds were diminished. In addition, basal crackles were heard in auscultation, and severe hypoxia (PO₂: 47.8 mmHg) was detected in the arterial blood gas sample. The patient was hemodynamically unstable, and the dyspnea was deteriorating. A chest X-ray showed areas of atelectasis and consolidation along with subcutaneous emphysema (Figure 2a). To exclude a pulmonary thromboembolism, thoracic CT images were obtained, which revealed subcutaneous emphysema, massive PM, minor bilateral pneumothoraces (<5%), and ground glass opacity on the basal lung fields (Figures 2b-d). Transthoracic echocardiography also determined that there was posterior displacement of the heart because of the PM that was compressing the right heart chambers. As a result of the clinical deterioration and subsequent echocardiographic findings, we decided to perform emergency surgery. Following a subxiphoid incision, the anterior mediastinum was explored, but no defects were apparent. Then air was evacuated via a 24F chest tube that had been inserted into the mediastinum.

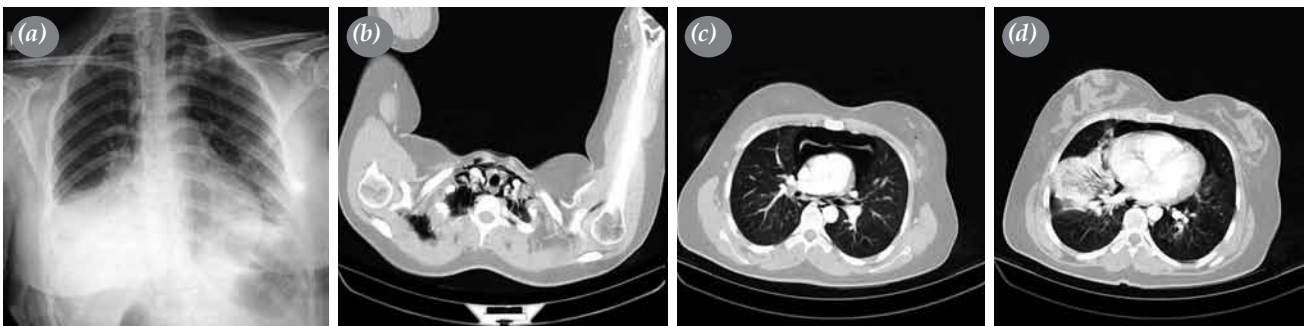


Figure 2. (a) Chest X-ray showing the subcutaneous emphysema around the neck and basal atelectasis. Thoracic computed tomography images illustrating (b) the widespread subcutaneous emphysema on the right side, (c) the massive air filling of the entire anterior mediastinum and (d) the ground glass opacity on the right basal lung areas.



Figure 3. Control computed tomography image of the second case showing the complete resorption of the pneumomediastinum.

The postoperative period was uneventful, and all of the patient's symptoms subsided. In an attempt to identify the underlying etiology of the PM, a bronchoscopy and esophagography were performed, but they did not reveal any pathological findings. A postoperative control CT scan was also done, and this showed the complete resorption of the subcutaneous emphysema as well as the PM. The patient was discharged in good condition and was still asymptomatic during the follow-up period (Figure 3).

DISCUSSION

Pneumomediastinum is a rare and mostly self-limiting, benign condition. However, there is still no clear and evidence-based approach related to the diagnostic and management issues for patients with this condition.^[4] Suspicion is the most important step in diagnosis. Conservative management is the treatment of choice for the majority of those with PM, and most can be treated successfully with supportive therapy. At our clinic, the patient in Case 2 is the only one that has required surgical treatment.

Alveolar rupture either results from high intra-alveolar pressure or low peri-vascular pressure that can cause PM (the Macklin phenomenon). When this happens, free air dissects along the bronchovascular sheaths and tracks into the mediastinum. Conversely, free air that enters accidentally may also reach the mediastinum by tracking down the fascial planes of the neck or through the diaphragmatic hiatuses.^[5]

The first case exemplifies the need for a cautious diagnostic approach to patients with subcutaneous

emphysema after dental surgery as this patient's clinical condition was initially misdiagnosed as angioedema. However, the crepitation on the right side of the neck was noteworthy, so a CT scan was performed, which confirmed the PM. This phenomenon occurs when air is forced into the fascial planes and the mediastinum after dental procedures. Conservative management was used to successfully treat this patient.

Contrary to the quiescent clinical course and conservative management of our first case, the second case had a severe course that eventually required surgery. Lipoabdominoplasties and mastopexies are aesthetic procedures that are frequently performed all over the world. Serious and fatal complications are very rarely seen following these procedures. However, in our case, tension PM caused by a hemodynamic compromise was encountered. To the best of our knowledge, this is the first case of its kind in the literature. Since our patient had no underlying risk factors for PM, we postulated that the combination of atelectasis, secretions, and surgical manipulations during liposuction might have played role in the pathophysiology. Fiorelli et al.^[6] stated that the negative pressure of the anterior chest wall during liposuction is sometimes partially responsible for the appearance of PM because the mediastinum and subcutaneous layers are connected to each other. The surgical approach should only be reserved for cases involving tension PM.^[5] We preferred to use a limited subxiphoid incision since our patient had tension PM and pneumopericardium. After the operation, the patient's symptoms improved rapidly, and the follow-up CT scan showed a complete recovery.

Usually PM manifests as a self-remitting clinical portrait that can be treated with conservative management, whereas tension PM, which warrants surgical treatment, is very rare. As our two cases point out, prompt suspicion, early recognition, and individualized treatment strategies are crucial for the management of PM.

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