

A rare case report: Cervical subcutaneous and mediastinal emphysema due to mastoid fracture

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ABSTRACT

Subcutaneous emphysema occurs when air enters the soft tissue, which usually appears in the soft tissues of the chest wall or neck. It may also arise from pneumothorax or skin lacerations after trauma or other reasons. Mediastinal emphysema may be either associated with subcutaneous emphysema or seen alone. The air in the mastoid cells may spread from the retropharyngeal region or various neck compartments into the mediastinum. Usually, no severe neurological or clinical findings are observed except crepitation on palpation. We present a case report of a mastoid fracture as a rare cause of cervical subcutaneous and mediastinal emphysema.

Keywords: Head trauma; mastoid fracture; mediastinal emphysema; subcutaneous emphysema.

INTRODUCTION

Subcutaneous emphysema occurs with the penetration of air into the skin. It usually occurs in the soft tissues of the chest wall or neck.^[1,2] The air enters the skin from the neck or lung but also rarely from the other anatomical parts of the body. Blunt or penetrating trauma, pneumothorax barotrauma, infection, malignancy and surgical procedures may cause subcutaneous emphysema and even it may occur spontaneously. [2–6] Iatrogenic procedures (tonsillectomy, dental extraction, endoscopy) and trauma (especially maxillofacial traumas) are the usual causes of cervical subcutaneous and mediastinal emphysema.^[7,8] Rarely, it may occur due to mastoid fracture. If there is no significant clinical sign, the mastoid fracture can easily be overlooked. We report a case of cervicomedial emphysema due to mastoid fracture. At first, nobody could have thought that it could happen due to head trauma because the patient had a blow to the chest mainly and had no cranial symptom.

CASE REPORT

A 25-year-old man was brought to the emergency department. He stated that he was beaten and had been hit to his

chest and head. He described pain in the neck and chest region. There was no neurologic deficit or any cranial nerve pathology. There was no any marked bruise on his chest, neck, face or head. However, there was crepitus on palpation of the chest and right neck area. Thorax computerized tomography (CT) revealed subcutaneous emphysema extending from the cervical region to the upper mediastinal area and neighborhood to arcus aorta (Fig. 1).

The patient was wanted to be admitted to the General Surgery service. However, there was no costal, sternal or clavicular fracture, and it was not clear from where the air entered the skin. The patient also had cervical and cranial CT scans. Firstly, no skull pathology was considered because there was no neurologic sign or intracranial pathology related to fracture. However, when we looked carefully, massive air seemed in the soft tissue planes of the right cervical area related to the mastoid air cells (Fig. 2). The air was forced towards the loose layers of connective tissue and subcutaneous cervical emphysema was occurred. Unlike the other two cases, in our patient, the fracture line was in front of the mastoid bone. Thus, the emphysema occurred in the anterior

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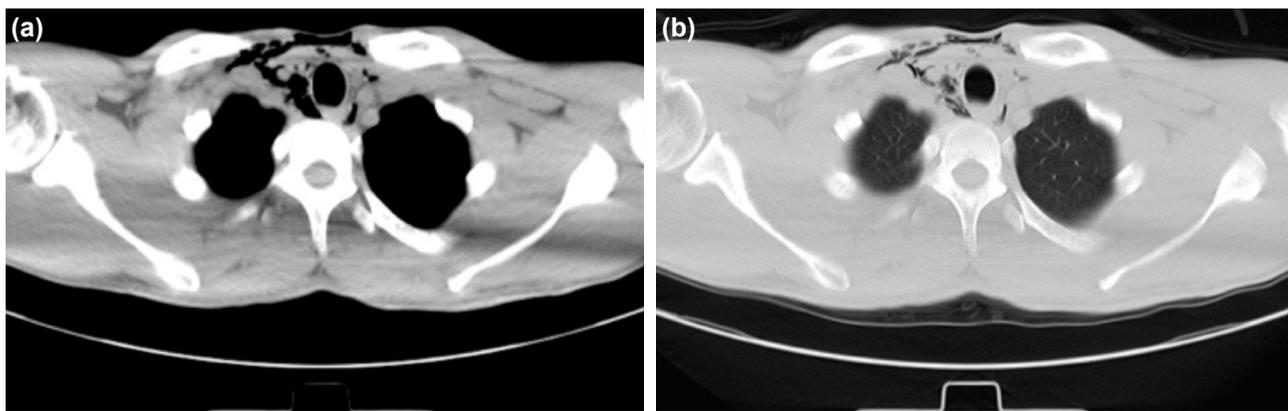


Figure 1. (a, b) Thorax CT scan demonstrating subcutan emphysema extending from the cervical region to the upper mediastinal area and neighborhood to arcus aorta.

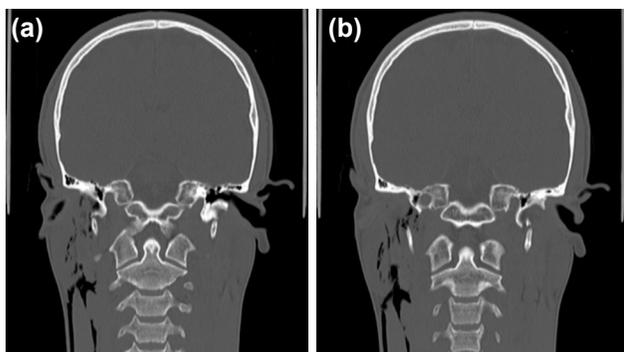


Figure 2. (a, b) Coronal cervical CT scan demonstrating massive air in the soft tissue planes of the right cervical area related with mastoid air cells.

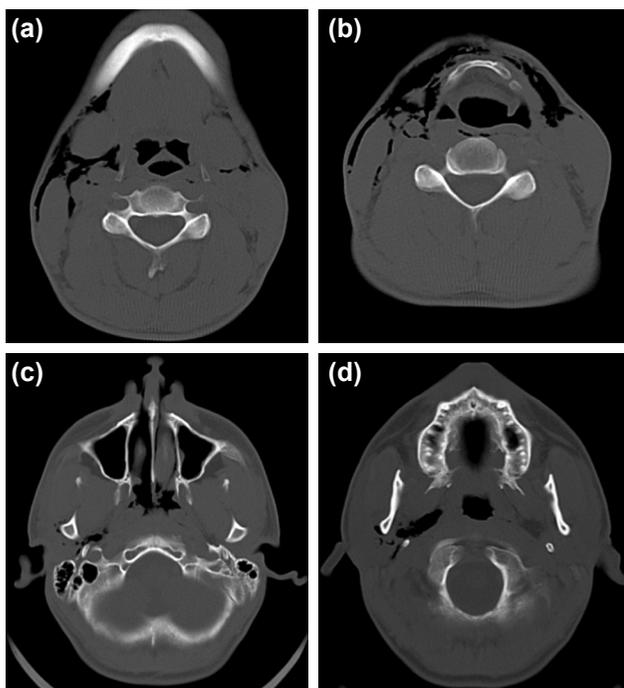


Figure 3. (a-d) Axial cranial and cervical CT scans demonstrating emphysema in the anterior area of the chest and neck.

area of the chest (Fig. 3). Patient's consent was obtained for this study.

DISCUSSION

Subcutaneous crepitus, swelling and pain in the neck and chest, dyspnea, and a sore throat are the clinical manifests of subcutaneous and mediastinal emphysema.^[9,10]

Eustachian tube protects the eardrum and otic ossicles by equilibrating the pressure in the middle ear with atmospheric pressure.^[11] It links the nose and nasopharynx cavity to the middle ear and mastoid cavity. The gas reservoir of the middle ear is served by the mastoid cavity. If the air is forced into the middle ear, the pressure of the air within the mastoid air cells increases. The mastoid fracture may lead to squeezing out the air from within and dissecting into the surrounding soft tissue planes.^[12]

Many cases have been reported about subcutaneous and mediastinal emphysema. Lots of subcutaneous cervical emphysema reports are related to maxillofacial and/or cervical traumas and surgery complications. Cervical subcutaneous and mediastinal emphysema due to isolated mastoid fracture has been reported twice. In the first case, a patient was kicked in the mastoid several times, and a linear closed fracture of the mastoid occurred. The authors attributed the source of the air from the patient's self-induced Valsalva maneuvers that forced air out beyond the fracture.^[13] In the second case, a patient was struck with a batted baseball to the right mastoid. Thus, a high velocity, focal impact to the mastoid bone led to a comminuted fracture of the mastoid. According to the authors, the impact displaced the mastoid air into the soft tissues and the air exited with sufficient force to dissect through the fascial planes.^[14]

Cervicomediastinal emphysema due to mastoid injury is a rare pathology, but it can be difficult to diagnose. Incorrect or incomplete diagnosis may affect the treatment. In addition, possible complications related to the mastoid fracture will be ignored. Thus, when we see the cervical subcutaneous and mediastinal emphysema, if there is a history of head trauma, we should consider the mastoid fracture.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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Conflict of Interest: None declared.

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OLGU SUNUMU - ÖZET

Nadir bir olgu sunumu: Mastoid kırığı nedeniyle oluşan servikal subkutan ve mediastinal amfizem

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Subkutan amfizem, cilt altı yumuşak dokuya hava girmesiyle oluşur. Genellikle göğüs duvarı veya boyun yumuşak dokularında ortaya çıkar. Travma sonrası pnömotoraks veya cilt laserasyonlarına bağlı gelişebildiği gibi başka nedenlerle de oluşabilmektedir. Mediastinal amfizem tek başına veya subkutan amfizemle birlikte görülebilir. Çok nadir sebeplerinden bir tanesi de mastoid kemik kırığıdır. Mastoid hücrelerinde bulunan hava retrofaringeal bölgeden veya çeşitli boyun kompartmanları arasında mediastene doğru yayılabilir. Genellikle bu hastalarda palpasyonla krepitasyon alınması dışında ciddi nörolojik veya klinik bulgu izlenmemektedir. Bu yazıda servikal subkutan ve mediastinal amfizemin nadir nedenlerinden biri olan mastoid kırığı sunulmaktadır.

Anahtar sözcükler: Kafa travması; mastoid kırığı; mediastinal amfizem; subkutan amfizem.

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