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EDİTÖRE MEKTUP / LETTER TO THE EDITOR

Pneumomediastinum following orbital fracture

Orbita fraktürü sonrası gelişen pnömomediasten

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To the Editor,

Subcutaneous emphysema caused by orbital, maxillary and zygomaticus fractures may extend to the mediastinum by using retropharyngeal and parapharyngeal areas which relate to sublingual and submandibular areas. Pneumomediastinum (PM) is a life-threatening condition because of complications, such as mediastinitis, pneumothorax, pneumopericardium and tension PM. In this article, a rare case of pneumomediastinum caused by isolated zygomaticomaxillary complex fracture treated conservatively is reported. A possible mechanism of contralateral extraconal orbital emphysema is explained with computed tomography finding. Importance of the physical examination and the avoidance from blowing of the nose is emphasized.

Forty-seven years old female patient was presented to our emergency department with the complaints of swelling and pain on the left orbit 12 hours after head-to-head collision with a child sliding through a water slide. The collision was limited to the left side of the face with no trauma to the neck or chest. There was no loss of consciousness. She stated that she had blown her nose several times. At the initial evaluation her vital signs were normal. Palpation of the soft tissues revealed crepitus involving the left periorbital regions, left maxillary sinus, bilateral angles of the mandible, bilateral part of the neck, clavicles and the sternum. Rest of the physical examination was noncontributory. Computed tomography (CT) scan of the head, neck and thorax showed fractures of the left orbital lateral and inferior wall, left maxillary anterior and lateral wall and left arcus zygomaticus (Fig. 1). Also, CT scans showed air images in bilateral orbital cones (Fig. 2), left periorbital and left maxillofacial places, bilateral temporal fosses, parapharyngeal and retropharyngeal spaces (Fig. 3) and mediastinum (Fig. 4). Then the patient underwent flexible bronchoscopy and esophagogastroscopy, but no further lesion was found. The patient was discharged without any complication and with antibiotic therapy after observation for two days and surgical treatment had planned.

PM develops in five mechanisms: 1) from structure in the thorax, by communication with the trachea, esophagus and alveoli, 2) from interstitial lung tissue, 3) from peritoneal space, 4) from retroperitoneal space, 5) from the deep fascias of the neck[1]. Although PM may have a thoracic, abdominal and cervical origin, it rarely develops after fractures of the facial skeleton. Due to life threatening complications of PM early recognition, investigation of underlying reasons and prompt initiation of treatment are crucial.

Fractures that connect orbit to paranasal sinuses, traumatic and surgical perforations of air-filled spaces of the head can lead to dissection of air to the surrounding soft tissues. Then, air may spread into the mediastinum via the submandibular, retropharyngeal, parapharyngeal, prevertebral and pretracheal spaces[2]. Compression of air inside the upper airways such as blowing of the nose plays

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important role in forcing air down to the mediastinum[3]. In our case, the most likely cause of PM was blowing her nose several times and there are two possible mechanisms of subcutaneous emphysema. First, migration of the air from the left orbit (through the infraorbital fissure and/or fractured lateral orbital wall), second, migration of the air from fractured left maxillary sinus walls. However, multiple facial fractures make it difficult to pinpoint entry of air to subcutaneous tissue[4].

Interestingly, CT scan showed right orbital and facial emphysema unexpectedly. There has been only one case report describing contralateral extraconal orbital emphysema. They suggested that air might reach the other side subcutaneously via the dorsum of the nose[5]. Continuous subcutaneous air images between left maxilla and right orbit support this mechanism and suggest that air can reach right orbit by using these regions (Figure 2).

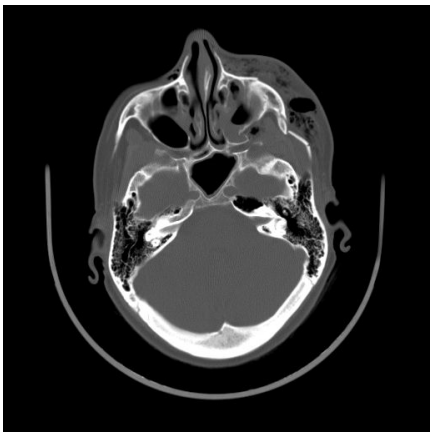

Figure 1. Axial image of the bone fractures and subcutaneous emphysema.

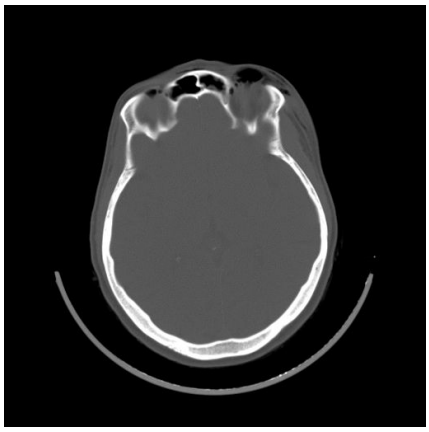

Figure 2. Bilateral pneumoorbita and air image in front of the frontal sinus.

Figure 3: Cervical emphysema.

Figure 4: CT image of pneumomediastinum.

The prevalent symptom of PM is chest pain radiating to the back, neck and shoulders, which may exacerbate on swallowing, coughing, deep inspiration, and that decreases on sitting. Subcutaneous emphysema in the neck may be the only sing of PM[6].

Management of these patients includes closed monitorization, protection of the airway, not to blow

nose, investigation of the cause, intravenous antibiotics for mediastinitis prophylaxis, oxygen administration, analgesics and involvement of the relevant specialties[7]. Mediastinitis, pneumopericardium, tension PM, airway obstruction and pneumothorax are life-threatening complications of PM[2].

As a conclusion, PM following orbital fracture usually requires closed observation and antibiotic therapy, but physicians must rule out other etiologic reasons and be aware of its potential life-threatening complications[8]. When subcutaneous crepitation is detected with palpation, determination of subcutaneous emphysema borders can help for the diagnosis of PM. Patients should be instructed to avoid from blowing of the nose. Air can reach contralateral orbit by dissecting subcutaneous tissues on nasal dorsum or frontal sinus.

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