CASE REPORT

Pneumomediastinum, pneumocephalus, and bilateral pneumo-orbita in the same patient: a rare dangerous coexistence but a lucky prognosis

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Abstract

Trauma is the leading cause of mortality and morbidity among young adults. In the emergency department, blunt and penetrating traumas must be evaluated carefully especially for life-threatening conditions. High-pressure air is a rare penetrating trauma type. Pneumomediastinum, pneumocephalus, and bilateral pneumo-orbita are all dangerous conditions and coexistence of them is extremely rare. There is no consensus for the treatment of this concurrence and, moreover, there is no opportunity for future randomized studies. Hence, in this study, we report a pneumomediastinum, pneumocephalus, and bilateral pneumo-orbita case after high-pressure air trauma and resolution with supportive care without any complication.

Keywords: Pneumomediastinum; Pneumocephalus; Orbit; Trauma.

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Introduction

Pneumomediastinum (PM) has three types: spontaneous, iatrogenic and traumatic. A traumatic PM can occur due to a head, face and cervical injuries, while chest pain, breathing difficulty, and emphysema in the neck/chest/clavicles may be important findings.[1] Pneumocephalus (PC) may be spontaneous and post-surgical as well as traumatic.[2] Pneumo-orbita (PO) is usually associated with orbital wall fracture and it can mimic inferior rectus entrapment.[3]

In this case report, we aim to describe a rare case of coexisting PM, PC and bilateral PO after high-pressure air trauma occurred as an industrial accident, and resolution with supportive care without any complication.

Case Report

A 19-year-old man was admitted to the emergency department (ED) of Bagcilar Training and Research Hospital, Istanbul in May 2017 with pain and oedema in his right eye and right side of his face. He confirmed that his complaints occurred after he was hit by an industrial tire-air compressor. It was revealed that one of his co-workers directed the tip of the tire-air compressor like a gun and pulled the trigger. The high-pressure air destructed the tissues in the same direction. Vital signs were as follows -- arterial blood pressure: 100/70 mmHg, respiratory rate: 20 in a minute, pulse: 82 bpm, temperature: 36.7^{O}C, oxygen saturation: 95%. Physical examination revealed that eye movements were not restricted in any direction and diplopia was not present. Right superior and inferior eyelids were full of oedema enclosing the eye. There was no sign of airway obstruction or breathing difficulty. Crepitus was detected in palpation over the right orbit, right cheek, and neck. Heart and bilateral lung sounds were normal by auscultation. Electrocardiogram was in normal sinus rhythm and laboratory investigations were in normal ranges. The orbital, maxillofacial, cranial, cervical and thoracic computed tomography (CT) showed PC, PM, bilateral PO, and subcutaneous emphysema in facial and cervical regions. CT of the head revealed PC without any fracture and widespread subcutaneous air in the right temporoparietal region, and in the right periorbital soft tissues. (Figure: A) Maxillofacial axial CT revealed diffuse free air images extending from the facial right half to the level of the zygoma, subcutaneous emphysema in the soft tissues, and right parafalengeal areas in the maxillary region at the temporomandibular junction. (Figure: B) On CT of the cervical, the right half of the neck was more pronounced and there were widespread free air images in the paratracheal areas between the soft tissue planes and muscle planes. (Figure: C) CT of the thorax revealed free air images in the mediastinum suggesting PM. (Figure: D) According to these findings, the patient was diagnosed with PC, PM, bilateral PO, and facial and neck subcutaneous emphysema. Ophthalmology, neurosurgery, thoracic surgery, and ear-nose-throat (ENT) consultations were obtained and the patient was admitted to the neurosurgery clinic. The patient was asked to keep sitting in an upright position and was instructed to avoid forceful blowing. To prevent potential mediastinitis, Ceftriaxone (one gram, intravenously, twice a day) and Netilmicin (three drops in a day) were given to prevent eye infection. Bed rest was recommended and oral feeding was discontinued. PM regressed and subcutaneous emphysema began to dissolve. The patient was discharged four days after admission and recommended to visit the outpatient clinic seven days after discharge.

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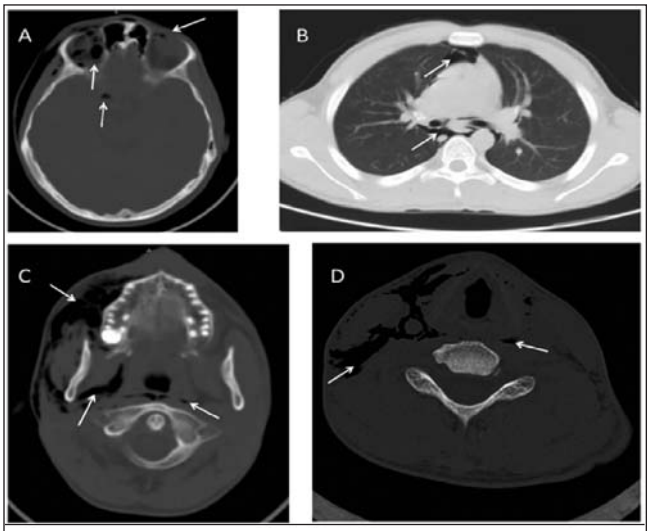

Figure: A. The head computed tomography of the patient shows pneumocephalus without any fracture and widespread subcutaneous air in the right temporoparietal region, and in the right periorbital soft tissues. B. Computed tomography of the thorax showing free air in the mediastinum. C. Diffuse free air images in parafalengeal areas extending from the level of right zygoma to the level of right temporomandibular junction in maxillofacial axial computed tomography of the patient. D. On the cervical computed tomography, there were widespread free air images in the paratracheal areas between the soft tissue and muscle planes.

Discussion

Yilmaz et al reported a case with PO and PM after a facial trauma caused by a high-pressure car washer.[4] Their patient was a 17-year-old male. There was no sign of pnemuothorax and/or pneumo-pericardium. The patient had received conservative treatment with bed rest, intravenous antibiotics and nil per os (NPO). He was discharged without any complication one week after admission and no long-term complications were observed. Our patient was similar to the extent in being hit by high-pressure air showing spontaneous regression without any complications. However, our case showed PC in addition to PM. Pnemuothorax was not present in our case, too.

Naiboğlu et al reported a case of PM after blowout fracture.[5] Their case was treated with sitting upright, 19-gauge needles for the resolution of subcutaneous emphysema, intravenous antibiotic treatment and discharged without any complication or surgical intervention. Cervellin et al reported PM after orbital injury and emphasised exclusion of oesophageal or tracheal rupture in these cases.[6] Our case showed PC without any fracture, took conservative treatment, and was discharged without any complication or surgical intervention.

PC usually results from a head or facial trauma, tumours, and surgical procedures but it can be seen spontaneously as well.[2] Traumatic PC was reported as a cause of neurological deterioration.[7] Traumatic PC has been reported to be associated with the negative intracranial pressure which causes cerebral spinal fluid (CSF) leakage. Another mechanism is that the dural tear causes an inflow of air into intracranial space.[7] If that mechanism turns into a one-way valve it can result in tension PC which may cause rapid deterioration of neurologic status.[8] Traumatic tension PC is a life-threatening condition requiring emergent intervention and may be seen as a delayed or recurrent condition.[9,10]

Hong et al reported a case of PM accompanying PC after blunt trauma and suggested a diagnosis algorithm especially for emergency physicians.[1] In their case, there were multiple maxillofacial fractures but our case did not show any fracture in the skull or orbital bones. Therefore, we considered that PM, PC, and PO may be due to that high flow air leakage rather than the air in the anatomical spaces of the head.

Conclusion

Blunt or penetrating injury patients must be assessed in a careful manner. All complaints must be considered and a detailed physical examination must be performed. One can miss a PM in a head trauma patient or vice versa.

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Conflict of Interest: None.

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