

Spontaneous pneumorrhachis associated with pneumomediastinum in a patient with diabetic ketoacidosis: an exceptional manifestation of a benign disease

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Spontaneous pneumomediastinum is a rare, generally self-limiting condition. We describe the case of a patient who presented a pneumorrhachis as an exceptional complication of pneumomediastinum.

Case report

An 18-year-old man with a history of type 1 diabetes mellitus presented with a sudden onset of retrosternal pain and dyspnea, preceded by a 3-day history of severe vomiting. The patient denied any fever but complained of new-onset headache. His vital signs were normal. Physical examination revealed a dehydrated patient with cervical subcutaneous emphysema and Hamman's crunch sign. There were no meningeal irritation signs. Laboratory tests showed important hyperglycemia and diabetic ketoacidosis (DKA).

Chest radiograph and CT revealed massive pneumomediastinum with bilateral cervical subcutaneous emphysema (Fig. 1). No pneumothorax or pleural effusion were noted. Boerhaave's syndrome was ruled out with contrast studies. A CT of the chest further documented the presence of an important pneumorrhachis (Fig. 2).

The patient was admitted for observation. All symptoms resolved within 48 hours, and serial chest radiographs documented regression of the pneumomediastinum.

Discussion

Atraumatic pneumomediastinum, defined as the presence of extraluminal gas

in the mediastinal space without any clear traumatic cause, has been reported in association with asthma exacerbation, emesis, childbirth, seizure, excessive shouting



FIG. 1. Pulmonary window of CT showing pneumomediastinum without pneumothorax.

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Notes de cas

and drug inhalation. Spontaneous pneumomediastinum is also a rare complication of DKA, reported 50 times in the English literature since Hamman's first description in 1937 (noted by Pooyan¹).

The causing mechanism involves an increased intrabronchial pressure that leads to alveolar rupture when enough gradient pressure is produced; then, the air penetrates peribronchial and perivascular spaces to reach the mediastinum. In DKA, this high pressure is probably caused by vomiting efforts and Kussmaul's respiration, a hyperpnoea phenomenon secondary to metabolic acidosis. This can lead to unusual air tracking in compartments other than the medi-

astinum; pneumothorax, pneumoperitoneum and pneumoretroperitoneum have been reported. The presence of air in the spinal canal (pneumorrhachis, also called epidural pneumatosis or aerorachia) has been reported in association with pneumomediastinum in a few cases.² It is caused by dissection of air through the intervertebral foramen reaching the spinal canal.

Pneumorrhachis is an unusual radiological finding that may be seen in a variety of settings, including lumbar puncture, epidural analgesia, trauma, epidural abscess or foreign body aspiration in a child.³ Pneumorrhachis associated with spontaneous pneumomediastinum usually has a

benign character and does not require any specific treatment, except when associated with a pneumothorax that can require chest tube insertion. Pneumorrhachis secondary to pneumomediastinum in the setting of DKA is a very rare condition; we found only 2 reports of such pathologies in the English literature.^{1,4}

The presence of pneumomediastinum after emesis and vomiting effort should raise the suspicion of Boerhaave's syndrome, and radiological investigation should be done carefully in each patient to rule out an esophageal perforation. The manifestation of pneumorrhachis associated with DKA is a benign complication of pneumomediastinum. This case is, to our knowledge, the third reported in the English literature.

Competing interests: None declared.

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FIG. 2. Mediastinal window of CT showing air in the spinal canal.