

**PNEUMOMEDIASTINUM SECONDARY TO HYPEREMESIS GRAVIDARUM IN THE  
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**ABSTRACT**

Here we present the case of a 28-year old patient developing pneumomediastinum secondary to hyperemesis gravidarum. Admitted for treatment several times for hyperemesis from the 9th week of pregnancy, when the patient was admitted to hospital for the 3rd time in the 13th week subcutaneous emphysema was identified on examination after complaining of pain around the neck. Imaging confirmed pneumomediastinum diagnosis. Pneumomediastinum is a very rare complication of hyperemesis. Rarely caused by esophagus rupture, this complication is more commonly thought to develop linked to alveolar rupture as a result of barotrauma. As morbidity and mortality are high in situations linked to esophagus rupture, early diagnosis has vital importance. This case report reviews the causes of pneumomediastinum in pregnancy and management choices.

**KEYWORDS:** Hyperemesis gravidarum, pneumomediastinum, subcutaneous emphysema.**INTRODUCTION**

Spontaneous pneumomediastinum and linked subcutaneous emphysema are rare complications of pregnancy and labor.<sup>[1]</sup> The estimated incidence in the literature is between 1/2000-1/100000 with the majority cases in the 2nd stage of labor.<sup>[1]</sup> There are very few cases linked to nausea and vomiting in the first trimester especially.<sup>[2]</sup> Pneumomediastinum develops as a result of barotrauma to the esophagus and alveoli and occurs as a life-threatening serious complication when linked to esophagus rupture. It may be observed in patients with findings mimicking acute abdominal and cardiac events linked to the severity of the clinical tableau and as a result early diagnosis carries vital importance.

Here, we wish to share the diagnosis and management of a treatment-resistant HG patient with this rarely-observed complication.

**CASE**

Applying to the emergency service with nausea-vomiting complaint in the 9th week of pregnancy, a 28-year old gravida 4, parity 2 and abortus 1 patient had ketones +3 in urine and was admitted with medical treatment planned. Apart from ketone positivity on admission, the patient had suppressed TSH levels with sT4 at normal levels so no antithyroid treatment was planned. The patient had no characteristics in her history, with no use

of cigarettes or alcohol. During the 1st week duration of admission, the patient was administered anti-emetic treatment for the first 4 days. Without clinical or laboratory amelioration, the patient began 40 mg/day steroid (prednol ampoule) treatment. The patient was discharged from hospital 5 days later on her own wishes. Two days after discharge, the patient reapplied to the emergency service with the same complaints and was admitted to hospital again. The patient was observed for 1 week with fluid replacement, anti-emetic treatment and steroid treatment. With amelioration of clinical and laboratory findings, the patient was discharged 10 days later. Four days later, when the patient was 13 weeks+3 days, she again applied to the emergency service with nausea-vomiting and weight loss. With moderate general state, the patient was observed to be anxious. TA: 90/60, pulse: 109, respiratory rate: 20/min and fever 36.7 were measured. The patient's laboratory findings were blood sugar: 223, sodium: 133, potassium: 4.8, white cells: 23000, hemoglobin: 17.6, Plt: 404000. In urine ketone value was +3. The patient was admitted and hydration and anti-emetics were begun. Diet regulation was performed. When the patient stated she had pain around the neck and difficulty breathing deeply, examination identified crepitations in the cervical region, above the bilateral clavicles and upper portion of the sternum. With prediagnosis of pneumomediastinum, the patient had advanced research begun. Lung sounds were normal and pulse oxymetry observed 97% O<sub>2</sub> saturation. Arterial

blood gas was taken with pH: 7.34, PCO<sub>2</sub>: 30.6 and lactate: 6.9. The patient consulted with a chest surgeon. Conventional PA lung x-rays were taken protecting the pelvis. Imaging observed subcutaneous air in the cervical region and above the clavicles (Fig. 1). Pneumothorax and similar other findings were not observed in the lungs or mediastinum. In addition to hydration and anti-emetics, the patient had 3 L/min 100% oxygen support, cold steam application and broad spectrum antibiotics begun and was placed under close monitoring. Ultrasonography was used to monitor fetal viability. On the 3rd day of monitoring subcutaneous crepitation was observed to reduce. With the improvement in the patient's nutritional state, the patient began TPN with support from the feeding and nutrition unit. Five days after diagnosis, crepitation was observed to be fully resolved. Due to the amelioration in clinical tableau and continuation of pregnancy, repeated imaging methods were not performed.



**Figure 1: Chest x-ray study demonstrating subcutaneous air in the neck.**

## DISCUSSION

Pneumomediastinum is the presence of air or gas in the mediastinum.<sup>[3]</sup> It is a very rare tableau. This clinical tableau developing linked to pulmonary or esophagus rupture rarely spontaneously develops.<sup>[4,5]</sup> Just as alveolar rupture may develop linked to excessive insufflation, it may develop secondary to significantly increased intrapulmonary pressure compared to chest wall pressure.<sup>[6]</sup> Esophagus perforation may be observed linked to trauma, vomiting or foreign objects. Spontaneous pneumomediastinum may be observed linked to situations like asthma attacks, inhaled medications, marijuana or cocaine use, positive pressure ventilation, excessive coughing, vomiting increased by the valsalva maneuver and labor.<sup>[7]</sup> Pneumomediastinum was first described in pregnancy in 1784.<sup>[8]</sup> This case was a situation developing during labor, with a very low

number of cases of pneumomediastinum secondary to HG in early pregnancy.<sup>[7]</sup>

HG is a situation characterized by severe nausea-vomiting in early pregnancy in addition to weight loss and fluid electrolyte imbalance.<sup>[9]</sup> Occurring in nearly one in every 100 pregnancies, it is a common clinical situation with unknown etiology.<sup>[9]</sup> Treatment involves symptomatic treatment methods like diet regulation, hydration and anti-emetics. In severe cases, there is a place for steroid treatment. In previous cases of pneumomediastinum secondary to HG, it was observed around the 10th week of pregnancy.<sup>[7,10]</sup> In these patients the mechanism was considered to be marginal alveolar rupture linked to increased abdominal pressure during vomiting. In our case, the tableau developed in the middle of the 13th week of pregnancy. Pneumomediastinum may occur as dyspnea, cough, palpitations, chest pain, difficulty swallowing and anxiety. In nearly 82% of patients, chest pain, dyspnea or both together are observed.<sup>[3]</sup> The two typical findings of pneumomediastinum are subcutaneous emphysema and the Hamman sign. The Hamman sign is a crunching or crinkling sound best heard between the 3-6 intercostal intervals on the left side of the sternum synchronized with cardiac activity.<sup>[11]</sup> Subcutaneous emphysema is typically defined by crepitation in the neck, facial region and shoulders.<sup>[7]</sup> Our patient had the symptoms of palpitations, anxiety and pain on deep breathing, together with subcutaneous crepitation.

The most important diagnostic tool in pneumomediastinum cases is conventional PA x-rays. The most common finding is elevation of the pleura. On lateral x-rays, observation of air behind the sternum is a more specific finding. Imaging of subcutaneous air in the cervical region at the level of the shoulders is important for diagnosis (Fig. 1). Conventional x-rays are also assessed for the presence of pathologies like accompanying pneumothorax.

Though diagnosis of pneumomediastinum is relatively easy, it may be difficult to identify the etiology. Determining the etiologic cause is important in terms of treatment approaches. Medical treatment is generally sufficient for events developing linked to alveolar rupture, but surgery may be required for esophagus rupture. Esophagus rupture is a more toxic tableau for the patient. For diagnosis of esophagus rupture, conventional x-rays are beneficial at rates of 68-88%.<sup>[12]</sup> When etiologic diagnosis is difficult, barium x-rays or CT may be chosen. Both methods should be performed with pelvis protection and doses taking account of pregnancy. If esophagus perforation is suspected, hydration and antibiotherapy should begin and surgical consultation be made.<sup>[7]</sup> With early diagnosis and treatment, survival is more than 80%.<sup>[13]</sup> Delayed diagnosis and treatment begun after more than 24 hours increase morbidity and mortality.<sup>[7]</sup>

In uncomplicated pneumomediastinum cases, close monitoring, analgesic and symptomatic treatment may be sufficient. Administering high concentration oxygen is considered to contribute to absorption of air in the mediastinum. The benefit of serial radiologic assessments is limited.<sup>[7]</sup> The majority of patients improve with support treatment. Our patient had full clinical amelioration on the 5th day with early diagnosis and support treatment and development of complications was prevented. Repeated imaging was not performed.

Our aim in presenting this case is to increase awareness among doctors due to the low number of cases especially in the first trimester of pregnancy. In conclusion, especially in HG cases with treatment-resistant nausea-vomiting, though rare, pneumomediastinum may develop and should be remembered for emergency management.

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