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Spontaneous pneumopericardium in a pregnant woman

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Introduction

Pneumopericardium is defined as the accumulation of air in the pericardial cavity (1). Many cases have since been reported, mostly due to blunt or penetrating chest injuries in adults. Spontaneous pneumopericardium is seen very rarely (2). The mortality rate for patients with pneumopericardium who present with symptoms of tamponade is 50% (3). We present the case of a 27-year-old 32-week-pregnant woman who died due to pneumopericardium.

Case Report

A 27-year-old 32-week-pregnant woman was admitted to the emergency department with a 3-day history of shortness of breath and chest pain. She did not define any history of trauma or surgery. On physical examination, body temperature was 36.6°C. Heart rate, blood pressure, and respiratory rate were 125 beat/min, 90/55 mm Hg, and 33/min, respectively. Tachycardia and decreased heart sounds were detected on cardiovascular examination; at the same time, crackle and splashing mill-wheel sounds were also observed. Bilaterally decreased breath sounds and subcrepitan rale were prominent in respiratory system. Electrocardiography (ECG) revealed sinus tachycardia. White blood cell count and C-reactive protein were 22000 mm³ and 7.22 mg/dL, respectively. Other laboratory parameters were within normal limits. In the examination by the obstetrician, intrauterine death was determined. A radiolucent area surrounding the heart was observed on chest X-ray (halo sign) (Fig. 1). Transthoracic echocardiography in the emergency department revealed air bubbles in the pericardial cavity (swirling air sign) together with the systolic echo signal loss. There was no signal loss in the epicardium and chest layers (Video 1). Thoracic computed tomography showed pneumopericardium and pericar-

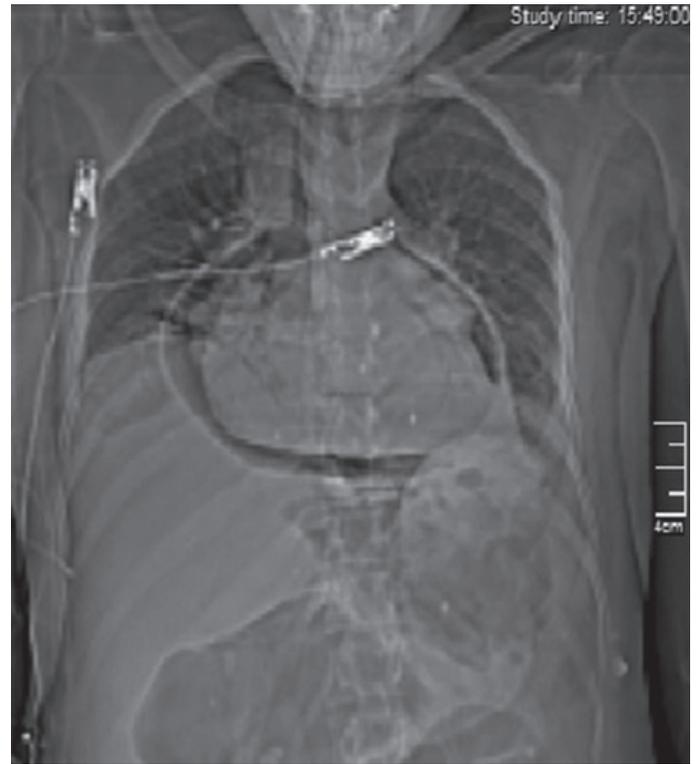


Figure 1. A radiolucent band of air completely surrounding the heart (halo sign)



Figure 2. Pneumopericardium on computed tomography

dial effusion (Fig. 2). In the fluoroscopic imaging-guided pericardiocentesis that was performed under emergency conditions due to deep hypotension, 300-mL foamy fluid with air was removed. Fluid was exudate on laboratory examination. There was no bacterial growth on culture. Adenosine deaminase was negative, and cytological investigation of the fluid was benign. Secondary to continuing respiratory distress, the patient was intubated. Positive inotropic therapy was started. No improvement was detected in hypotension, and cardiopulmonary arrest occurred. Cardiopulmonary resuscitation failed, and the patient died.

Discussion

Pneumopericardium is defined as the accumulation of air in the pericardial cavity. The most common cause is blunt or penetrating chest trauma. It can also develop secondary to positive pressure mechanical ventilation, benign or malignant tumor rupture, and bronchogastric fistula in connection with pericardium and iatrogenic causes (2–4). Spontaneous pneumopericardium in pregnant women is quite rare. Patients usually present with chest pain, shortness of breath, hypotension, palpitations, and syncope. On physical examination, crackle sound with every heartbeat—Hamman sign—is typical. In addition, a murmur in the form of “bruit de moulin” which defined gurgling or splashing mill-wheel sounds heard when both fluid and air are present in the pericardial sac can be heard on auscultation (5). In our patient, there were significant crackle and splashing mill-wheel sounds synchronized with the cardiac rhythm. A radiolucent appearance surrounding the heart partially or completely can be seen on chest X-ray (halo sign). The upper limit of the air in pneumopericardium is limited by the ascending aorta and pulmonary artery while it spreads up to upper mediastinum and neck in pneumomediastinum (6). Loss of systolic echo signal in pneumopericardium was first shown in 1983 and termed as air gap sign. Air bubbles can be seen in the pericardial cavity (swirling bubbles sign). Computed tomography can be useful in diagnosis and identification of the etiology (7, 8). In our patient there were no pathology (cyst, tumor, etc.) in the lungs and mediastinum except pneumopericardium on thoracic computed tomography. Differential diagnoses include angina pectoris, myocardial infarction, aortic dissection, pericarditis, pneumothorax, and pulmonary embolism (9). Electrocardiography, chest X-ray, echocardiography, and computed tomography findings compatible with the pneumopericardium rule out the previously mentioned situations in the differential diagnosis. Detailed examination to find out the exact etiology could not be done due to the short period between admission and death. There is no specific treatment for pneumopericardium cases without signs of tamponade. The air is generally absorbed in 2 weeks. The mortality rate for patients who present with symptoms of tamponade is 50%. Emergency pericardiocentesis or pericardial window opening is life saving for these patients (10). In our patient, although emergency pericardiocentesis was carried out, the patient did not survive.

Conclusion

Although it is very rare, pneumopericardium should be considered in the differential diagnosis in pregnant woman presenting with chest pain and shortness of breath. Since mortality rate of patients with pneumopericardium having tamponade is very high, early diagnosis and accurate treatment are of clinical significance.

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Video 1. Apical 4 view on transthoracic echocardiography showing spontaneous contrast echoes in the pericardial cavity (swirling air sign) together with the systolic echo signal loss.

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