

## How do we safely treat pneumopericardium in a severely ill baby?

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**Abstract:** Tension pneumopericardium in an infant is a rare but potentially fatal event. In the present study, we describe a new technique to drain the air from the pericardial sac of a critically ill baby. We performed this drainage via the subxiphoid approach in the Trendelenburg position rather than the anti-Trendelenburg position.

**Key words:** Pneumopericardium, pericardiocentesis, Trendelenburg position, infant

### 1. Introduction

Pneumopericardium is a rare and potentially fatal event in infants (1,2).

### 2. Case report

A 2-month-old boy who weighed 4 kg was receiving mechanic respiratory therapy in the intensive care unit because of metabolic disorder, aspiration pneumonia, and significant lung pathology. Pressure-controlled ventilation was used due to decreased lung compliance with relatively high ventilator settings. The patient had a pneumothorax because of barotraumas, and a chest tube had been placed in the left hemithorax 2 days earlier. Although the patient's cardiovascular condition was stable, he was suddenly deteriorating (i.e. decreased perfusion and profound hypoxemia and bradycardia). The endotracheal tube did not appear to be dislocated. Transthoracic illumination, which was performed to detect the presence of pneumothorax, was normal. The patient's plain chest radiograph showed a halo of air around the heart. The air surrounding the heart was primarily extending to the cardiac base (Figure 1). The apical region had a small amount of air (on chest X-ray measurement it was only 2.5 mm, compared with 10.6 mm at the cardiac base). The heart could not be observed through the echocardiographic windows. Tension pneumopericardium was assumed to be the primary cause of the cardiorespiratory deterioration. Although simple needle pericardiocentesis is an appropriate therapy in most cases, the procedure could have been more dangerous in the present case because of the air position. We thought that the Trendelenburg position would move

the air from the cardiac base to the apical region (Figure 2). After the patient was maintained in the Trendelenburg position for 2–3 min, a left subxiphoid approach was made with a 21-gauge needle attached to a 10-mL syringe containing 2 mL of physiological serum. The needle was advanced continuously aspirated and this suddenly caused the aspiration of 7–8 mL of air. The infant's heart rate increased instantly and peripheral perfusion improved. A chest radiograph confirmed that there was no residual air around the heart (Figure 3).



**Figure 1.** A chest X-ray film showing pericardial air around the heart, an endotracheal tube at the carina, and a left pleural tube without evidence of pneumothorax.

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**Figure 2.** The baby was inclined to approximately 45° in the Trendelburg position during the emergent pericardiocentesis.



**Figure 3.** Radiography taken during the postprocedure period shows the resolution of the pneumopericardium.

### 3. Discussion

Tension pneumopericardium is not tolerated very well in infants because they have a lower cardiac reserve compared with older patients. Tension pneumopericardium requires emergency drainage of the pericardial sac. Failure to achieve effective drainage may result in rapid cardiac

arrest. Drainage of the pericardial sac may be achieved while the patients are in the Trendelenburg position if the air did not spread equally around the heart. In classic pericardial effusion, however, drainage is performed while the patient is in the anti-Trendelenburg position.

### References

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