DURING induction treatment for acute lymphoblastic leukemia, a 13-year-old girl developed prolonged neutropenia and aspergillus pneumonia. Echocardiographic examination revealed a pericardial effusion with a maximal width of 3.5 cm. During the following 14 days, electrocardiography revealed normal cardiac function (shortening fraction >40%, ejection fraction >65%), although diastolic compression of the right atrium and a slight diastolic compression of the right ventricle were observed (Figure 1, A; available at www.jpeds.com). Pleural effusion required the placement of a bilateral pleural drain. Echocardiography on day 11 post-diagnosis of fungal pneumonia revealed unusual bright spots in the pericardial space, suggesting bubbles of trapped air (indicated by the arrow in Figure 1, B).

The patient developed anuria (<1 mL/kg/h) and an increasing need for supplemental oxygen. On day 14, respiratory failure required emergent intubation. Tracheal tube suction produced massive amounts of white foamy secretion, suggestive of pulmonary edema. For mechanical ventilation, high pressure and 100% oxygen were required to achieve satisfactory oxygenation. In parallel, acute hypotension necessitated resuscitation doses of catecholamines. Chest radiograph revealed a massive pneumopericardium (Figure 2, A) and air space shadowing due to pneumonic infiltrates or pulmonary edema.

Emergency pericardiotomy and pericardial drainage (Figure 2, B) were performed and led to immediate improvement of the clinical condition with normotension, facilitated ventilation, and sufficient diuresis within 3 hours. The patient recovered and remains in remission of acute lymphoblastic leukemia.

Cardiac insufficiency and subsequent multi-organ failure may develop in a patient with pericardial effusion, despite normal cardiac output and contractility variables. Trapped pericardial air bubbles, as previously described in only a few adult cases,1,2 can precede overt pneumopericardium. Life-threatening tension pneumopericardium with cardiac tamponade, which is rare in children,3,4 was triggered by mechanical ventilation in this case. Attentive echocardiographic monitoring may be useful to identify patients at risk, thereby allowing for a more timely initiation of surgical intervention.

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References


Figure 1. Echocardiography imaging (4-chamber view). A, Pericardial effusion 5 days after diagnosis of pneumonia. B, Air bubbles in the pericardial space (arrow), 11 days after diagnosis of pneumonia.