

Tension Pneumopericardium After Cardiac Surgery A Rare but Lethal Problem

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A 13-month-old girl who had no medical history uneventfully underwent patch closure of an atrial septal defect under mild hypothermic cardiopulmonary bypass. An immediately postoperative chest radiograph did not show any unusual findings (the Figure, A), and the process of weaning her from the ventilator was started. Just before extubation (6 hours after transfer to the intensive care unit), a sudden desaturation occurred, and a massive bloody secretion drained through the endotracheal tube. Echocardiography

showed that the interventricular septal motion was slightly paradoxical, but ventricular contractility was normal. Chest radiograph revealed an unexpected massive pneumopericardium with bilateral pulmonary edema and pneumomediastinum with subcutaneous emphysema (the Figure, B). After a large amount of air was drained by mobilization of a pericardial tube, vital signs and arterial blood gas stabilized. Close observation of the patient with full sedation, diuretics, and decompression of the stomach did not detect the addi-

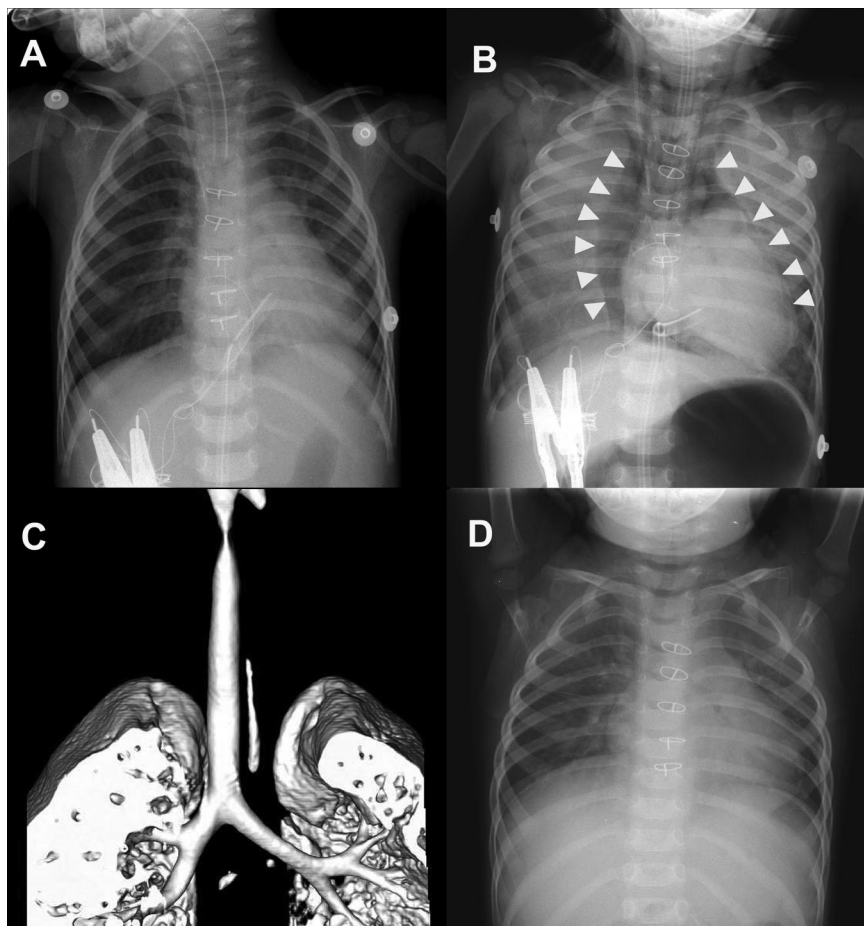


Figure. Serial simple chest radiographs (A, B, and D) and computed tomography with airway reconstruction (C). A, Image taken immediately postoperatively shows no remarkable finding. B, Simple image obtained 6 hours after the operation reveals massive pneumopericardium (arrowhead) with bilateral pulmonary edema and pneumomediastinum with subcutaneous emphysema. C, Chest computed tomography with airway reconstruction performed 7 days after the operation shows patent airway. D, No remarkable finding was observed in simple chest radiograph performed at discharge (on postoperative day 9).

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tional active air leak. Moreover, no laboratory abnormalities suggestive of infection were found. No further invasive workup was conducted. Extubation was performed on postoperative day 3, and an oral diet was begun on postoperative day 4. During oral feeding, no clinical or laboratory evidence of esophageal leak was evident. A chest computed tomography performed on postoperative day 7 revealed a patent major airway (the Figure, C) and no specific findings in the thoracic cavity. On postoperative day 9, the patient was discharged without any clinical evidence of injury in the major airway or esophagus, and a simple chest radiograph was unremarkable (the Figure, D).

Tension pneumopericardium is uncommon and is caused mainly by mechanical ventilation in infants or by trauma.¹ Although the mechanism of tension pneumopericardium is not fully understood, it can occur without injury of the major airway or esophagus. Since tension pneumopericardium developed during weaning from the mechanical ventilator in our

case, it is considered to have been a possible mechanism in the present case that air from alveoli was disrupted as a result of elevated alveolar pressure, dissected the pulmonary hilum, and entered the pericardial cavity. Additionally, inadequate pericardial drainage also may have played a role in the development of tension pneumopericardium.

Although tension pneumopericardium rarely occurs, especially after cardiac surgery, it can be lethal. Therefore, smooth weaning from a mechanical ventilator must be achieved after cardiac surgery, and adequate pericardial drainage must be ensured.

Disclosures

None.

Reference

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