

# Traumatic Pneumopericardium in A 14-Year-Old Adolescent: A Report of a Rare Case

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DOI: <https://doi.org/10.36347/sasjs.2025.v11i09.005>

| Received: 11.07.2025 | Accepted: 02.09.2025 | Published: 08.09.2025

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## Abstract

## Case Report

Pneumopericardium is a rare condition defined by the presence of air within the pericardial cavity. We report the clinical case of a 14-year-old adolescent girl admitted to the emergency department following a fall from the third floor (a suicide attempt). The aim of this article is to highlight the importance of prompt and multidisciplinary management of this uncommon pediatric entity.

**Keywords:** Pneumopericardium, Thoracic Trauma, Pediatrics, Chest CT Scan, Pericardiocentesis.

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## INTRODUCTION

Pneumopericardium is exceedingly rare in pediatric trauma. It most commonly arises from severe direct or indirect thoracic injury. Early diagnosis is critical, as the condition may be associated with life-threatening complications such as cardiac tamponade.

## CASE REPORT

We report the case of a 14-year-old female patient admitted to the emergency department following a fall from the third floor, in the context of a suicide attempt.

On admission, neurological assessment revealed a Glasgow Coma Scale (GCS) score of 14. Cardiovascular examination showed severe hypotension (blood pressure 80/50 mmHg), a heart rate of 80 bpm, and a prolonged capillary refill time exceeding 3 seconds. Cardiac auscultation revealed muffled heart sounds.

Respiratory examination demonstrated tachypnea at 25 breaths per minute, without subcutaneous emphysema or flail chest. Abdominal evaluation revealed generalized guarding in the absence of external wounds. Musculoskeletal examination noted a deformity of the right ankle, associated with swelling and cyanosis. The pelvis was stable but elicited pain upon palpation.

A thoracic CT scan revealed a pneumopericardium associated with a thin right-sided pneumothorax, without other significant pulmonary lesions (see imaging below). Given the initial hemodynamic instability, an urgent pericardiocentesis was performed, allowing evacuation of approximately 200 mL of air from the pericardial cavity, which led to a rapid improvement in the patient's hemodynamic status.

### Thoracic CT scan image

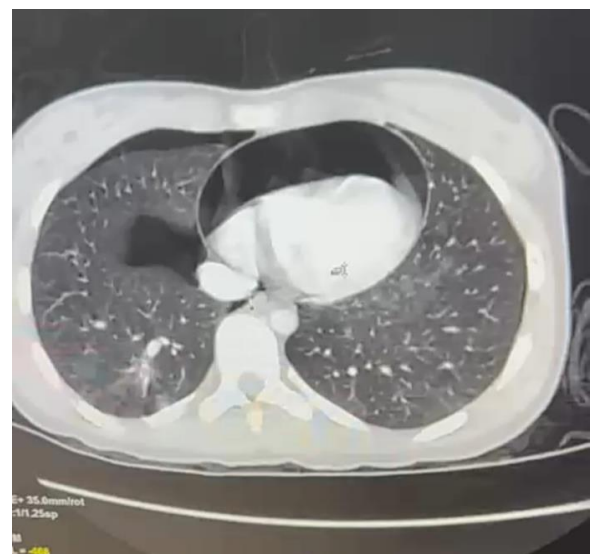


Figure 1

**Citation:** El Idrissi A., Laaroussi MA., Idrissa AM., Briki J., Maiga A., Bouhdadi H., Leghlimi H., Benlafqih C., Rhissassi J., Sayah R., Laaroussi M. Traumatic Pneumopericardium in A 14-Year-Old Adolescent: A Report of a Rare Case. SAS J Surg, 2025 Sep 11(9): 925-926.



**Figure 1**

**Axial CT slice clearly demonstrating the presence of air within the pericardial cavity surrounding the cardiac silhouette**

## DISCUSSION

CT imaging provided key diagnostic findings. Figure 1 highlights the presence of air surrounding the cardiac silhouette, sharply delineated and without air-fluid levels, findings that are characteristic of pneumopericardium. The absence of significant pleural detachment or associated effusion supports the hypothesis of a blunt chest trauma with alveolar rupture and localized air migration.

Computed tomography remains the imaging modality of choice in this traumatic context, as it not only confirms the presence of pneumopericardium but also helps exclude other life-threatening thoracic injuries such as aortic dissection, pulmonary contusions, or tracheobronchial ruptures. In this case, the radiological findings justified urgent pericardiocentesis to prevent progressive cardiac compression.

The pathophysiological mechanism of traumatic pneumopericardium may involve alveolar

rupture secondary to blunt chest trauma, allowing air to migrate into the pericardial cavity through anatomical pathways such as the pulmonary perivascular sheath or a diaphragmatic defect. Other cases reported in the literature have emphasized that this air migration can also be facilitated by a sudden increase in intrathoracic pressure at the time of impact. Our case is consistent with previously described reports, both in terms of the need for prompt pericardiocentesis and the favorable outcome achieved with appropriate management.

## Consent and Ethical Considerations:

Informed consent was obtained from the patient and her legal guardians for the publication of this case report and the associated images.

## CONCLUSION

This clinical case illustrates a rare presentation of traumatic pneumopericardium in an adolescent. It highlights the critical role of emergency thoracic imaging and the importance of rapid, multidisciplinary management. Early intervention, particularly pericardiocentesis in cases of hemodynamic instability can be life-saving. This case also underscores the need for appropriate psychological support in adolescents experiencing self-inflicted trauma.

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