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## Introduction

Thoracic injury is the 3rd leading cause of death in trauma. Traumatic Pneumopericardium (PPC) was first described in 1844 by Bricheteau and is characterized by the collection of air in the pericardial sac.

Although variable in etiology, three pathophysiologic origins of PPC have been described including: 1) a pneumopericardial connection in the presence of a PTX, 2) interstitial air tracking along the pulmonary perivascular sheaths from the ruptured alveoli to the pericardium, and 3) direct trachea-bronchial-pericardial communication.

The purpose of this study is to review the injury characteristics associated with PPC and the incidence of restrictive cardiomyopathy with severe thoracic injury.

## Methods

57,640 trauma patients were evaluated and treated at our ACS-verified Level 1 adult trauma center between January 2015 to December 2021. The trauma registry was queried to identify patients with PPC.

The electronic medical record (EMR) was reviewed for patient demographics, physiology, injury patterns, surgical interventions, length of stay (LOS), Injury Severity Score (ISS), Abbreviated Injury Scale (AIS)-chest score, complications, and death.



**Figure 1.** AP Chest X-Ray showing cardiac shadow encased by a thin air-filled translucent pericardial sac (Black arrow)

**Figure 2.** CT-Chest showing anterior pneumopericardium with flattening of the free wall of the right lateral ventricle (White arrow)



## Results

Out of 488 patients with pneumomediastinum, 16 were identified with PPC with mean age of  $42 \pm 17.7$  years (Range 14 - 77), male gender (81%) and blunt trauma (69%). Median GCS score was 11, ISS =  $31 \pm 14.4$  and AIS-chest = 3.

Most had a pneumothorax requiring a thoracostomy (88%) with 56% observed rib fractures, ICU admission (100%), a mean LOS  $13.6 \pm 14$  days and total LOS of  $23 \pm 27$  days.

Three patients required an emergent pericardial window for tension physiology and the remaining managed with observation. Incidence of PPC was < 1% of all trauma admissions. Three deaths occurred in our cohort related to their underlying severe traumatic brain injury and comfort care decision.

## Conclusion

Tension physiology requiring decompression is more rare. PPC is an uncommon phenomenon in severe thoracic trauma and managed with close observation.

## References

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