Case Study

Concealment of Death in Blunt Thoracoabdominal Trauma

Abhishek Soni

3rd year Post graduate, Forensic Medicine and Toxicology, Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh

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Abstract

Introduction: Blunt thoracoabdominal trauma is a common and potentially fatal injury mechanism, often resulting from vehicular accidents, assaults, or workplace incidents. In certain cases, efforts are made to conceal the true cause of death by providing misleading histories, which poses a significant challenge for forensic investigation.

Case Presentation: We report a case involving a 21-year-old male laborer found unresponsive in a factory premises. The initial history suggested a sudden cardiac death. However, detailed postmortem examination revealed multiple rib fractures, massive hemothorax, and lacerations of the liver and spleen, confirming death due to blunt thoracoabdominal trauma. The findings were incompatible with the alleged history, indicating an attempted concealment of the actual cause of death.

Discussion: This case highlights the forensic significance of discordant clinical histories and autopsy findings. Literature indicates that blunt force trauma, particularly involving noncompressible torso hemorrhage, remains a leading cause of early trauma-related mortality. Concealed homicides involving blunt trauma have been documented, emphasizing the need for systematic and multidisciplinary evaluation. Autopsy findings such as internal hemorrhage, organ laceration, and absence of external injuries must be carefully interpreted in such contexts.

Conclusion: This report highlights the indispensable role of forensic pathology in identifying concealed deaths due to blunt trauma. Accurate determination of cause and manner of death is essential not only for legal accountability but also for ensuring justice in cases where initial narratives are misleading.

Keywords: Abdominal trauma, Autopsy, Blunt force injury, Concealed death, Forensic pathology, Hemorrhagic shock, Thoracic trauma

Introduction

Blunt thoracoabdominal trauma is a significant cause of morbidity and mortality, commonly resulting from road traffic accidents, workplace injuries, falls, or physical assault. [1] It involves a forceful impact to the chest or abdomen, often damaging vital organs such as the lungs, liver, spleen, and large blood

Corresponding Author: Abhishek Soni, 3rd year Post graduate, Forensic Medicine and Toxicology, Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh.

E-mail: drabhisheksonimbbs@gmail.com

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vessels. While the injuries themselves may be life-threatening, what complicates such cases further is when the true cause or manner of death is hidden or intentionally misrepresented. [2] Concealment of death—whether to avoid legal consequences, financial liability, or social stigma—poses a serious challenge in forensic investigations. [3]

Every death under suspicious or unclear circumstances requires a thorough and systematic evaluation. The first clues often come from the crime scene itself. The location, physical evidence, body position, and surrounding environment all offer important insights into what might have transpired. Even subtle signs—like traces of blood, disturbed clothing, or the arrangement of nearby objects—can help reconstruct the sequence of events. Witness statements, if available, can provide useful leads, but they must always be weighed against the physical findings.[4]

In such cases, the role of the forensic pathologist becomes crucial. A detailed autopsy can uncover internal injuries that may not be visible externally, revealing a hidden narrative that contradicts the alleged history. For instance, fractures, organ lacerations, and internal bleeding often point toward significant trauma that cannot be explained by natural causes. When such findings clash with the version of events provided by bystanders or family members, the possibility of concealment must be considered. [5]

Ultimately, the pursuit of truth in forensic medicine relies on a blend of science, experience, and critical thinking. By piecing together evidence from the scene and the body, forensic experts aim to establish what really happened—ensuring justice for the deceased and closure for their loved ones. In cases of concealed blunt thoracoabdominal trauma, this commitment to uncovering the truth becomes all the more essential. [6]

Case Report

A case was brought to the forensic department of a medical College Hospital of Central India for postmortem examination under suspicious circumstances, wherein the history provided by bystanders suggested a sudden, natural death—allegedly due to a cardiac event.

The deceased was a 21-year-old male employed as a laborer at a private industrial facility engaged in paper processing. He was responsible for operating trolleys used in the internal transport of raw materials. According to coworkers, he had been sleeping in the open premises of the facility. Following rainfall during the night, he reportedly moved to a sheltered area around 4:00 AM. At approximately 5:00 AM the next morning (15th June 2024), he was found unresponsive. Several vehicles, including trucks and trolleys, were stationed nearby at the time of the incident.

The initial narrative provided by associates at the scene claimed a sudden collapse suggestive of myocardial infarction. However, inconsistencies in the alleged timeline and circumstances, combined with the absence of medical history and the environment in which the body was discovered, raised suspicion. This prompted a detailed medicolegal autopsy, which ultimately unveiled such findings that effectively exposing an attempt to conceal the actual cause of death.

External Examination:

The body was that of an average-built adult male, received in a supine position on the autopsy table. He was dressed in a multicolored shirt and brown undergarments, both of which were intact and devoid of blood stains, straw, or foreign material. Rigor mortis was well established in all four limbs, and postmortem lividity was fixed over the posterior aspects of the body.

A reddish-tinged fluid was noted oozing from the nostrils and mouth—an important indicator suggestive of underlying thoracic trauma rather than natural cardiac arrest. A contused abrasion measuring approximately 3 × 2 cm was identified over the medial aspect of the right arm, situated about 7 cm below the shoulder joint. This injury, although subtle externally, pointed toward blunt force application and raised suspicion when viewed in the context of the internal findings. No other obvious external injuries or defense wounds were observed. (Figure 1-4)

Figure 1: External facial appearance of the deceased at the scene showing blood-stained nostrils and perioral region suggestive of internal thoracic injury; no visible external trauma over the face or head.

Figure 2: Full-body view of the deceased at the scene showing a horizontal contusion pattern over the anterior chest, suggestive of track-line injury consistent with blunt force trauma.

Figure 3: Contused abrasion measuring approximately 3 × 2 cm over the medial aspect of the right upper arm, located about 7 cm below the shoulder joint—indicative of localized blunt force impact.

Figure 4: Contused abrasion measuring approximately 3 × 2 cm over the medial aspect of the left upper arm, located about 5 cm below the shoulder joint—indicative of blunt force trauma on the contralateral limb.

Internal Examination:

On dissection of the thoracic cavity, fractures of the 4th, 5th, and 6th ribs on the left side were clearly visible. The left lung displayed a laceration over its anterior surface, and the pleural cavity was filled with a large volume of blood, indicative of a massive hemothorax. These injuries were severe and could not be attributed to any natural cause such as a myocardial infarction. Rather, they pointed toward significant mechanical trauma to the chest.

Examination of the abdominal cavity revealed approximately 1.5 liters of blood, confirming massive intra-abdominal hemorrhage. The liver and spleen were both lacerated, with visible tears along their anterior surfaces—again consistent with a high-impact blunt force injury. The stomach contained semidigested food, suggesting that the incident occurred within a few hours after the last meal. All internal organs were notably pale, corroborating the diagnosis of hypovolemic shock secondary to internal hemorrhage as the physiological cause of death. (Figure 5 & 6)

Taken together, the internal findings provided unequivocal evidence of fatal blunt thoracoabdominal trauma. The presence of multiple organ lacerations, fractured ribs, and hemothorax/intra-abdominal bleeding strongly contradicted the initial history of

sudden death due to heart attack, which typically lacks such traumatic signatures. The absence of any pre-existing natural cardiac pathology and the presence of focused, high-energy impact injuries led to the conclusion that the cause of death was traumatic in nature, rather than natural.

Figure 5: Internal examination showing lacerated liver and gallbladder with adjacent splenic involvement; extensive intra-abdominal hemorrhage evident, consistent with fatal blunt abdominal trauma.

Figure 6A: Lacerated spleen with surrounding clotted and free intra-abdominal blood, indicative of severe blunt force impact and massive hemorrhage. Figure 6B: Opened cranial cavity showing pale and intact brain tissue; systemic pallor of all organs observed, consistent with profound hypovolemic shock due to thoracoabdominal hemorrhage.

Discussion

The case report presents a compelling example of concealment of death in the context of blunt thoracoabdominal trauma, highlighting critical forensic and pathological considerations that align with established literature on traumatic mortality patterns and post-mortem findings. The findings of lacerated spleen with massive intraabdominal hemorrhage, combined with intrathoracic hemorrhage resulting in generalized organ pallor, demonstrate the lethal nature of combined thoracoabdominal injuries that characterize some of the most challenging forensic cases.

While abdominal injuries—such as lacerations to the liver or spleen—are more frequently associated with concealed trauma due to their internalized location, thoracic injuries can also go unrecognized, especially in the absence of external signs. Rib fractures, for example, may occur following significant blunt force trauma without corresponding abrasions or contusions on the overlying skin. This has been well documented in autopsy studies, where up to 27% of rib fractures were found in patients with no visible external injuries, particularly in younger or lean individuals with pliable thoracic walls. [3,7] Such findings emphasize the importance of thorough internal examination and imaging in suspected cases of concealed trauma. In this case, the presence of multiple rib fractures and lung laceration without prominent external trauma supports this pattern and reinforces the need for careful forensic evaluation when the alleged cause of death does not align with postmortem findings.

The pathological findings in this case are consistent with established mortality patterns in blunt trauma, where hemorrhagic shock remains a predominant cause of death. Current literature indicates that hemorrhage accounts for 30-40% of trauma mortality, with solid organ injuries being particularly lethal. [7] The splenic laceration observed in this case aligns with data showing that the spleen is the most commonly injured organ in blunt abdominal trauma, with mortality rates reaching 48.8% in patients with massive intraabdominal bleeding. [8,9] Studies have demonstrated that hemorrhage -induced hypotension predicts high mortality rates of up to 54%, and in cases of massive

hemothorax, uncontrolled bleeding remains the main cause of death. [10,11] The combination of thoracic and abdominal hemorrhage in this case represents what trauma literature terms "noncompressible torso hemorrhage," which contributes significantly to early mortality within the first six hours of injury. [12]

The forensic significance of this case extends beyond the immediate pathological findings to encompass broader issues of concealment in traumatic deaths. Research indicates that concealment occurs in approximately 8% of homicide cases, with blunt force trauma being the most common cause of death in concealed homicides. [13] The patterns observed in this case - massive internal hemorrhage with evidence of blunt trauma - are consistent with studies showing that death from head trauma accounts for about 40% of concealed homicide cases. [14] The challenge of distinguishing between accidental and intentional trauma in cases where concealment is suspected has been extensively documented, with delayed diagnosis occurring in up to 17.3% of trauma cases, often complicating forensic investigations. Modern forensic practice emphasizes the importance of multidisciplinary evaluation using novel radiological and analytical techniques to properly assess cases where concealment is suspected, as the methodology must be case-specific and comprehensive to ensure accurate determination of cause and manner of death.[7]

Conclusion

This case highlights the vital role of meticulous forensic investigation in unveiling concealed causes of death, particularly in instances of blunt thoracoabdominal trauma where misleading histories are provided. The discordance between the alleged natural cause and the significant internal injuries uncovered during autopsy—such as rib fractures, organ lacerations, and massive internal hemorrhage—illustrates how deliberate attempts to mask trauma can be exposed through systematic postmortem examination. The findings not only refuted the initial claim of cardiac arrest but also raised suspicion of possible foul play, and eventually highlighting the medico-legal responsibility to pursue the truth. This reinforces the need for vigilance, interdisciplinary coordination, and scientific rigor in all suspicious deaths to uphold justice and prevent wrongful conclusions.

Ethical Approval

The study was approved by the Institutional Ethics Committee of Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh vide letter no. IEC/2024/111 dated 03.01.2025

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