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Original Research Article

Fatal Stab Wound Patterns in Homicidal Cases: A Forensic Case Series Highlighting Sharp Force

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Abstract:

Background: Stab wounds are one of the most common forms of homicidal sharp force trauma encountered in forensic pathology. Careful assessment of wound morphology—such as number, depth, distribution, and associated defensive injuries—provides crucial information for reconstructing the dynamics of assault, identifying weapon characteristics, and interpreting medicolegal significance.

Case Presentation: This case series describes four homicidal fatalities involving sharp force trauma autopsied at Gandhi Medical College, Bhopal, between January 2024 and May 2025. Case 1 involved multiple clustered abdominal wounds with defense injuries, suggestive of a domestic confrontation. Case 2 demonstrated targeted deep abdominal stab wounds with injury to vital organs, consistent with premeditated homicide. Case 3 presented with a stab wound containing a retained blade fragment, reflecting extreme force. Case 4 revealed multiple erratic wounds, including vertical clusters on the thigh, representing an overkill pattern associated with rage or emotional involvement. In all cases, the certified cause of death was hemorrhage and shock.

Conclusion: This series highlights the forensic significance of stab wound profiling in homicidal deaths. Clustered wounds suggest personal conflict, targeted injuries point toward deliberate intent, overkill patterns reflect emotional involvement, and retained blade fragments indicate excessive force. Detailed wound documentation and interpretation strengthen homicide reconstruction, weapon correlation, and judicial processes.

Keywords: Homicide; Stab Wounds; Sharp Force Trauma; Defensive Injuries; Forensic Pathology.

Introduction

Homicidal sharp force trauma is a frequent cause of unnatural death encountered in forensic practice worldwide. Among these, stab wounds constitute one of the most common presentations and are often inflicted with easily accessible sharp-pointed weapons such as knives, scissors, or broken glass fragments [1]. The medicolegal significance of stab wounds lies not only in establishing the cause of death but also in reconstructing the sequence of events, the type of weapon used, and the dynamics of victim–assailant interaction [2].

The morphology of stab wounds—defined by parameters such as number, depth, direction, anatomical location, and associated defensive injuries—provides valuable clues in distinguishing homicide from suicide or accident [3,4]. Defense wounds, typically present on the palms, forearms, and dorsal hands, are classic indicators of resistance and struggle during assault [5]. In contrast, the distribution of clustered or multiple overlapping injuries often points toward deliberate, repeated attacks, sometimes reflecting the assailant's intent, emotional state, or interpersonal relationship with the victim [6].

Over the years, several forensic studies have emphasized the role of wound profiling in homicide investigations. Deep, targeted wounds to vital organs usually reflect premeditated intent, while excessive and erratic injuries may indicate rage or personal motives—phenomena commonly termed "overkill" [7,8]. Moreover, the retention of weapon fragments in situ highlights the application of extreme force and can serve as direct evidence linking the weapon to the crime [9].

India, like many countries, continues to report a high incidence of stabbing deaths due to the availability and concealability of sharp weapons [10]. Comprehensive documentation and analysis of wound patterns in homicidal cases are therefore essential, as they enhance weapon matching, contribute to assailant profiling, and strengthen the overall medicolegal interpretation. This case series presents four homicidal deaths with distinct stab wound patterns, emphasizing the forensic relevance of sharp force profiling in crime reconstruction.

Case Presentation

Case 1: Clustered Wounds Suggesting Domestic Homicide

A 32-year-old female government employee was brought for medicolegal autopsy following a suspected homicidal assault. External examination revealed multiple clustered stab wounds over the anterior abdominal wall and upper limbs. Deep incised wounds were also noted on the thumb, palm, and forearm, representing classic defensive injuries. Internal examination showed penetrating injuries to lungs, liver, and intestines, with pale organs due to blood loss. Cause of death was certified as hemorrhagic shock. The clustered distribution and presence of defense wounds suggested a deliberate close-range assault, most likely during a face-to-face domestic confrontation (Figure 1).

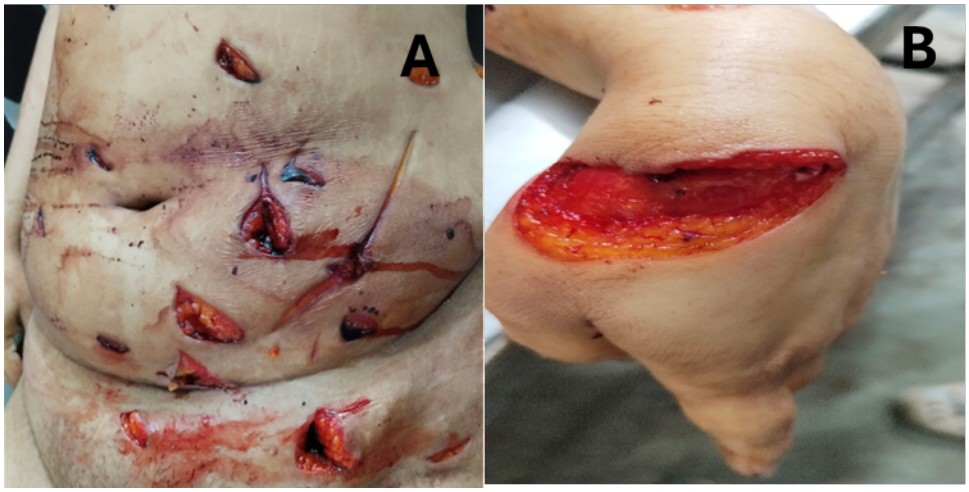

Figure 1: A: Multiple clustered stab wounds on anterior abdominal Region; B; Deep incised wounds on thumb/palm area (Case 1)

Case 2: Targeted Fatal Injuries Consistent with Premeditated Attack

A 37-year-old housewife was examined postmortem after sustaining deep stab wounds in the upper abdominal region. The wounds were clean-cut, elliptical, and clustered above the umbilicus. Internal examination revealed damage to heart, liver, and spleen. A defensive wound was observed at the base of the thumb. Cause of death was hemorrhagic shock. The precise targeting of vital organs and forceful thrusts suggested a planned homicidal assault with intent to kill (Figure 2).

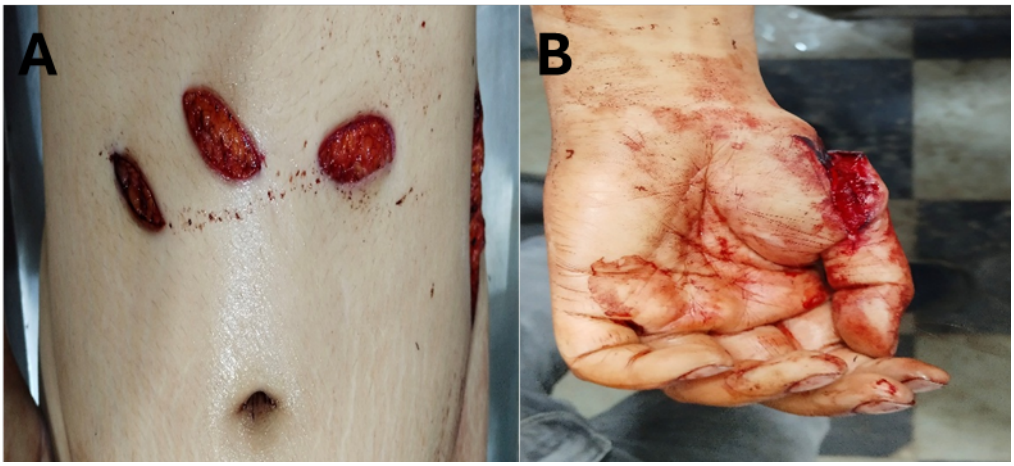

Figure 2: A: Clustered stab wounds on the upper abdomen, B: Deep incised wound on the thumb base (thenar eminence) of the palm (defensive wound) (Case 2)

Case 3: Retained Blade Fragment Reflecting Extreme Force

A 28-year-old male private employee was found with a penetrating stab wound in the left infrascapular region, within which a metallic blade fragment was retained. Multiple superficial scratches and oblique incised wounds were present over the back and lateral chest. Internal findings confirmed severe hemorrhage. The injury profile indicated an attack from behind with repeated blows, and the broken blade fragment suggested use of excessive force or a poor-quality weapon (Figure 3).

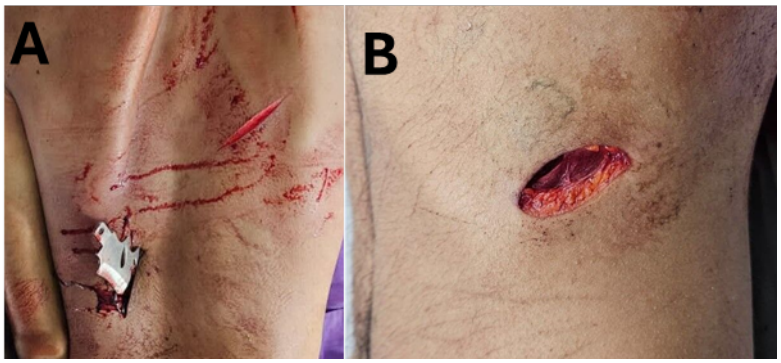

Figure 3: A: Stab wound over the back with retained blade fragment, B: Stab wound over the lateral aspect of chest (Case 3).

Case 4: Overkill Pattern Indicating Rage or Emotional Involvement

A 17-year-old male driver sustained numerous stab wounds across the thighs, chest, abdomen, and arms. Over ten wounds were arranged in vertical lines on the right thigh, varying in depth and direction. Injuries were clean-cut, elliptical, and inflicted with considerable force. Cause of death was hemorrhagic shock. The repetitive and erratic nature of the injuries indicated an overkill pattern, consistent with an emotionally charged assault involving rage or personal motive (Figure 4).

Figure 4: Multiple clustered stab wounds and puncture-type incised wounds on the anterior and medial aspects of both thighs (Case 4)

Discussion

Stab wounds are among the most frequently encountered homicidal sharp force injuries in forensic medicine, accounting for a significant proportion of violent deaths worldwide [1]. Their medicolegal significance extends beyond establishing the cause of death, as detailed analysis of wound morphology can provide insight into the type of weapon used, the assailant–victim interaction, and the psychological context of the assault [2].

One of the most important forensic features in homicidal stabbing is the distribution and clustering of injuries. Concentrated wounds over vital regions, such as the chest or abdomen, usually indicate deliberate targeting aimed at causing rapid fatality [3]. Conversely, dispersed or multiple superficial wounds often reflect erratic violence or hesitation. In this series, both clustered abdominal injuries and erratic patterns were observed, supporting the interpretation of differing intent and emotional state of the assailants.

The presence of defense wounds is another key indicator of victim resistance. Injuries located on the hands, forearms, and palms are widely recognized as classical signs of active defense, and their

documentation is critical in confirming homicide [4,5]. Such findings not only demonstrate the victim's attempt to resist but also exclude the possibility of self-infliction.

Excessive or repetitive injuries, often referred to as overkill patterns, have been described in literature as markers of extreme emotional involvement, anger, or revenge [6,7]. The identification of such patterns highlights the psychological dimension of homicidal assaults and can assist investigators in exploring motive. Similarly, the detection of retained blade fragments within wounds reflects extreme force or weapon failure, providing direct forensic evidence for weapon–injury correlation [8].

Sharp force injury profiling thus remains a cornerstone of forensic investigation. Careful evaluation of wound number, depth, orientation, and associated features enhances reconstruction of events, aids in weapon matching, and strengthens the medicolegal interpretation of homicide [2,3,9].

Conclusion

Stab wounds continue to be a major challenge in forensic pathology, particularly in homicidal deaths where sharp force injuries predominate. Careful profiling of wound patterns provides essential information for understanding the dynamics of the assault, the type of weapon used, and the psychological context of the crime. In this case series, clustered wounds highlighted deliberate targeting, defensive injuries confirmed victim resistance, retained blade fragments reflected the application of extreme force, and overkill patterns suggested strong emotional involvement or rage.

Such findings reinforce the significance of meticulous documentation and interpretation of wound morphology in medicolegal investigations. By correlating external and internal injuries, forensic experts can reconstruct the sequence of events, differentiate homicide from suicide or accident, and support weapon identification. Ultimately, stab wound profiling strengthens crime scene reconstruction, aids suspect profiling and provides valuable evidence in judicial proceedings.

Given the variability in stabbing patterns, further studies with larger sample sizes and inclusion of weapon recovery are warranted to enhance the understanding of sharp force trauma and improve forensic investigative practices.

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