CASE REPORT

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Accidental Fatal Neck Injury from Mechanical Saw: A Case Study and Forensic Perspective

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Abstract

Accidental cutthroat injuries caused by mechanical saws are rare but can result in fatal outcomes, requiring meticulous forensic investigation to determine the manner of death. This case report describes the postmortem findings of a 21-year-old carpenter who sustained a fatal cutthroat injury while operating an electric circular saw. The injury pattern, including complete severance of critical neck structures and the absence of hesitation marks or defensive wounds, confirmed the accidental nature of the incident. This report discusses the forensic considerations, medico-legal implications, and the importance of workplace safety, supported by a review of similar cases in the literature.

Keywords: Accidental, Death, Injuries, Neck, Occupational, Sharp, Trauma

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Introduction

Cutthroat injuries are among the most severe and potentially fatal injuries encountered in forensic practice, particularly when caused by sharp mechanical tools such as circular saws. These injuries can result in catastrophic damage to vital structures in the neck, including major blood vessels, the trachea, and the esophagus, often leading to rapid death if not immediately addressed. The neck is uniquely vulnerable due to its exposed and largely unprotected anatomy, making it a frequent site of injury in workplace accidents involving high-risk machinery.

In industrial settings, workers operating mechanical saws face significant risks due to the high speed and sharpness of these tools. Although rare, accidental cutthroat injuries involving circular saws demand a meticulous forensic investigation to establish the manner of death—whether accidental, suicidal, or homicidal. Such investigations often rely on a combination of injury patterns, scene evidence, and corroborative witness statements.[1]

This case report details the postmortem findings of a 21-year-old carpenter who sustained a fatal cutthroat injury while operating an electric circular saw. It highlights the forensic considerations, medico-legal implications, and the critical importance of workplace safety protocols. A review of similar cases from the literature is included to provide additional context and emphasize the need for preventive measures in industrial environments.

Case History

A 21-year-old male carpenter was found deceased at his workplace, lying in a pool of blood near a mechanical circular saw. According to eyewitness accounts, the incident occurred while he was cutting wooden planks on an electric circular saw. There were no indications of a struggle or foul play at the scene, and the decedent had been working alone at the time of the accident.

During the external examination, the face, neck, and hands of the deceased were heavily covered with dense, dried blood. A deep, irregular incised wound measuring approximately 14 cm in length and 6 cm in width was observed horizontally across the upper part of the neck, approximately 5 cm below the tip of the chin. The wound extended laterally to 5 cm from the lobule of the left ear and 4 cm from the lobule of the right ear. The depth of the wound was greatest at the center, completely severing the skin, underlying muscles, blood vessels, nerves, and tracheal rings. The wound displayed recesses and projections that corresponded to the teeth of the circular saw, confirming it as the causative tool (Figure 1).

No hesitation marks were observed, and there were no defensive wounds on the hands or forearms, ruling out the possibility of a struggle or self-infliction. The deceased's clothing was intact and bore no signs of tearing or other injury-related damage. Internal examination revealed a complete transection of the trachea and esophagus, along with partial severance of the left carotid artery and jugular vein, which resulted in massive blood loss and rapid death.

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Figure 1: Cutthroat injury on the neck

The mechanical saw, located near the body, measured 27 cm in diameter and 0.2 cm in thickness. The teeth of the saw were 0.5 cm in height, with a separation of 1 cm between each tooth. The injury pattern, including the recesses and projections on the wound margins, was consistent with the saw's specifications, providing strong evidence of its involvement.

The findings, combined with the scene evidence and corroborative eyewitness testimony, confirmed that the injury was accidental and occurred while the deceased was operating the mechanical saw.

Discussion

Cutthroat injuries, although uncommon, present significant forensic and medical challenges, particularly in determining the manner of death. These injuries may result from accidents, suicides, or homicides, each requiring meticulous forensic evaluation to identify the underlying cause. In the present case, several factors pointed to an accidental origin. The absence of hesitation marks, defensive wounds, or damage to clothing, along with eyewitness testimony and the alignment of the injury pattern with the mechanical saw, strongly supported this conclusion. The irregular wound margins, featuring recesses and projections consistent with the saw's teeth, further substantiated the mechanical nature of the injury. Postmortem findings revealed complete severance of critical structures, such as the trachea and major blood vessels, leading to rapid exsanguination and confirming the fatal outcome.

This case aligns with findings from Alam *et al*. (2023), who classified cutthroat injuries as suicidal, homicidal, or accidental in their study of patients in Jharkhand, India. Suicidal injuries accounted for 77.14% of cases, with young adults from lower socioeconomic backgrounds being the most affected group. Accidental injuries, however, were rare, underscoring the importance of a detailed forensic investigation in such cases to exclude other possibilities.[2] Similarly, Chappidi and Chilukuri (2018) found that accidental cutthroat injuries comprised only 13.3% of their cases, with most injuries being homicidal (56.6%) or suicidal (30%). Their study emphasized the need for multidisciplinary management, involving collaboration among otolaryngologists, anesthetists, and psychiatrists to ensure comprehensive care for survivors of such injuries.[3]

Contrastingly, Rao (2015) reported no accidental injuries in their autopsy study of 74 cases in Jamaica, where homicides dominated (97.29%). These were often associated with gang-related violence and relationship disputes, disproportionately affecting low-income individuals. Exsanguination and asphyxia due to blood aspiration were the leading causes of death. Such stark variations in the incidence and causes of cutthroat injuries across regions highlight the diverse forensic challenges these cases pose.[4]

The forensic evaluation of the current case emphasized key elements, such as injury characteristics, scene evidence, and tool-specific features. The absence of hesitation marks or defensive wounds ruled out suicidal or homicidal intent. The alignment of the saw with the injury and the intact condition of the workplace corroborated the accidental nature of the incident. Tool-specific features, including recesses and projections on the wound margins matching the saw's specifications, provided definitive evidence. Additionally, the lack of struggle indicators, such as torn clothing or defensive wounds, further excluded foul play.[1]

Literature on similar injuries reinforces the importance of these forensic considerations. For example, Demirci *et al*. (2008) emphasized matching wound characteristics to the suspected tool in accidental throat-cutting cases.[5] Meanwhile, Prahlow *et al*. (2001) highlighted the importance of integrating scene evidence with injury analysis to distinguish accidental fatalities from other causes.[6] Rare instances of suicide using mechanical saws, as described by Grellner *et al*. (2009), further demonstrate the complexity of such evaluations and the necessity of corroborating evidence to identify intentional injuries.[7]

Beyond forensic evaluation, this case underscores the critical need for workplace safety measures. Accidental fatalities involving mechanical saws highlight the importance of implementing strict safety protocols, including routine maintenance of machinery, mandatory operator training, and the use of protective gear. Chappidi and Chilukuri (2018) also stressed the role of advancements in diagnostic and therapeutic modalities in improving outcomes for survivors of cutthroat injuries. However, prevention remains paramount, particularly in high-risk industrial environments where hazardous equipment is routinely used.[1,3]

This emphasizes the need for a comprehensive forensic approach that integrates injury analysis, scene evidence, and corroborative findings to ascertain the manner of death. By drawing lessons from previous studies and prioritizing safety

protocols, the risk of similar incidents can be mitigated, contributing to safer workplace practices and potentially saving lives.

Conclusion

This case highlights the critical role of forensic investigation in determining the manner of death in rare yet fatal incidents involving mechanical saws. The absence of hesitation marks, defensive injuries, and evidence of foul play, coupled with scene findings and eyewitness accounts, confirmed the accidental nature of the injury. Such cases underscore the importance of workplace safety measures, including proper training, protective equipment, and regular maintenance of hazardous machinery. By prioritizing these measures, the risk of similar accidents can be significantly reduced, ensuring a safer environment for industrial workers.

Conflict of Interest

There is no conflict of interest

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