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Morphological Spectrum of Wound Types of Forensic Interest Found on the Human Body in Aba, Southeastern Nigeria: 2014-2023 Retrospective Analysis

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ABSTRACT

In the course of death, injuries of the body are often associated with a wide range of potentially life-threatening assaults. In all physical assaults, whether it result in death or not, the assailant has produced and left different types of marks on the victim's body. The morphologies of these marks help reconstruct the cause of death. This study investigates and categorizes the morphologies and different types of marks left on a victim's body in the course of death in Aba, Southeastern Nigeria, highlighting their significance in forensic investigations, which could serve as a veritable tool in reconstructing the crime scene and determining the cause of death. A retrospective analysis was conducted on autopsy reports and medical records from January 2014 to December 2023, focusing on cases with documented wound types found on the victim's body that provide salient and useful data for the forensic crime investigator. The study categorized wounds into types such as sharp force, blunt force, gunshot, and thermal injuries, etc. Examining their frequency, demographic data, and potential implications for forensic outcomes. The results showed that a total of 1,200 cases were analyzed and categorized into various wound types, which include: 40% cases of lacerations, 25% of incised wounds, 15% of abrasions, 10% of puncture wounds, 5% of gunshot wounds, and unclassified wounds. Findings reveal that sharp force injuries were the most prevalent, particularly among young males, with 66.7%, suggesting a correlation with interpersonal violence. The study underscores the importance of comprehensive wound analysis in forensic pathology, providing critical insights for law enforcement and legal proceedings. Recommendations for further research and enhanced forensic training in the region are proposed to improve the accuracy and efficacy of investigations involving traumatic injuries.

Keywords: Forensic pathology, Wound, Sharp injuries, Blunt injuries, gunshot injuries, trauma, Crime scene.

INTRODUCTION

Forensic pathology plays a crucial role in the investigation of crimes, providing essential insights into the circumstances surrounding injuries and death [1]. In forensic science, injuries or wounds are marks that are produced by physical violence to a living body in which the tissue is divided or its natural continuity broken. Wound analysis in forensic science plays a critical role in understanding the dynamics of trauma and the circumstances surrounding injuries [2, 3]. The morphological spectrum of wound types provides vital insights into injury mechanisms , the nature of trauma, and potential implications for legal investigations. In the context

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of Aba, a region marked by unique socio-cultural and environmental factors, characterizing wound types is particularly significant.

This research aims to conduct a retrospective analysis of various wound morphologies encountered in forensic cases within Aba, examining their characteristics, causes, and correlations with specific types of violence or accidents. By systematically categorizing wound types, such as lacerations, abrasions, punctures, and contusions [4], this study seeks to identify prevalent patterns and trends that may inform both forensic practice and public health strategies.

Moreover, understanding the morphological spectrum of wounds can aid forensic experts in accurately interpreting injury patterns, contributing to the resolution of criminal cases and the administration of justice [5]. This analysis not only enhances the existing body of knowledge within forensic pathology but also addresses the broader implications of trauma in the Aba metropolis, ultimately fostering a better understanding of injury prevention and intervention strategies. Through a comprehensive examination of historical data, this research aims to bridge gaps in the forensic literature and lay a foundation for future studies in this vital area of forensic science.

MATERIALS AND METHODS

Study Design: This research employed a retrospective design to evaluate the morphological spectrum of forensic-interest wound types in Aba. The study focused on cases documented over a specific time frame (10 years), allowing for comprehensive data collection and analysis.

Study Population: The study population includes all forensic cases involving trauma treated at designated medical facilities and forensic laboratories from January 2014 to December 2023. Cases were selected based on the availability of detailed medical records, autopsy reports, and police documentation that provide relevant information about the wounds.

Data Collection:

- Source of data: Medical records, autopsy reports, and police files were accessed through collaboration with local hospitals, forensic pathology units, and law enforcement agencies. Institutional review board (IRB) approval was obtained for the study to ensure compliance with ethical standards.
- Inclusion criteria: Cases included in the study had to meet the following criteria: Documented evidence of trauma, a clear description of wound morphology, and the availability of comprehensive medical or autopsy reports.
- Exclusion criteria: Cases were excluded if: Wound descriptions were insufficient or ambiguous, the case did not involve forensic investigation (e.g., Non-violent injuries).
- Data Extraction: Data were extracted using standardized data collection form that include the following: Patient demographics (age, sex, etc), Type of wound(laceration, abrasion, contusion, puncture, incised, etc), location of wound on the body, mechanism of injury(eg, assault, accident, self-inflicted), context of incidence(e.g. Domestic violence, gang related, accidental), Medical treatment received, and then Outcome (eg. Recovery, death)

Wound Classification: Wounds were classified based on established forensic criteria, as follows:

- Lacerations: Irregular tears caused by blunt force.
- Abrasions: Superficial injuries resulting from friction.
- Contusions: Bruises resulting from blunt force trauma.
- Puncture wounds: Deep wounds caused by pointed objects.
- Incised wounds: Clean cuts caused by sharp instruments.Etc. .

Forensic examination Protocol: Each wound was examined using a standard protocol, which included:

- Visual inspection

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- Measurement of wound dimensions(length, width, depth)
- Photographic documentation.
- Assessment of associated injuries(e.g., fractures ,contusions)

Interviews: Where possible, brief interviews were conducted with patients to gather information on the circumstances surrounding the injury, the incident context , and any relevant history.

Data Analysis: Statistical analysis was performed using SPSS software (version 28.0). Descriptive statistics were calculated for demographic variables and wound types. Frequencies and percentages were used to summarize categorical variables, while means and standard deviations were employed for continuous variables. Chi-square tests were utilized to assess associations between categorical variables, with a significance level set at $p<0.05$

Ethical Consideration: The study adhered to ethical guidelines for research involving human subjects. All data were anonymized to protect patient confidentiality, and informed consent was obtained where applicable. The research was conducted in accordance with the Declaration of Helsinki

RESULT

A retrospective analysis of forensic-interest wound types in Aba over a 10-year period revealed a diverse morphological spectrum. A total of 1,200 cases were examined, categorized into various wound types, including lacerations, abrasions, incised wounds, puncture wounds, and gunshot wounds

1. Lacerations: The most frequently observed wound type, comprising 40% of cases. These wounds were primarily associated with blunt force trauma and often presented irregular edges with varying degrees of tissue damage.
2. Incised wounds: Representing 25% of the cases, incised wounds were predominantly found in cases of assault and were characterized by clean, sharp edges. Most occurred in the upper limbs and neck , indicating a tendency towards defensive injuries.
3. Abrasions: Accounting for 15% of the total, they were commonly associated with road traffic accidents and indicated superficial skin damage . The patterns observed often suggested the mechanism of injury, which includes scraping against rough surfaces.
4. Puncture wounds: Making up 10% of the cases, these wounds were typically linked to stabbing incidents. Their round or oval shapes and depth variation highlighted the use of various sharp objects and pointed instruments.
5. Gunshot wounds: Comprising 5% of the total, gunshot wounds were notable for their severe tissue damage and often resulted in complex injury patterns. The analysis includes both entrance and exit wounds, with significant implications for forensic ballistics.
6. Unclassified wounds: The remaining 5% of wounds could not be specifically categorized due to atypical characteristics or insufficient documentation.

The morphological spectrum of wounds in Aba reflects a range of violence-related incidents, with lacerations and incised wounds being the most prevalent. The findings underscore the importance of detailed forensic examination in understanding injury mechanisms and enhancing the investigative process in forensic medicine. Further studies are recommended to explore the underlying socio-economic factors contributing to these injuries.

Table 1: Frequency Distribution of Wound Types.

Wound Type	**Frequency**	**Percentage (%)**
Lacerations	480	40
Incised Wounds	300	25

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Abrasions	180	15
Puncture Wounds	120	10
Gunshot Wounds	60	5
Unclassified Wounds	60	5
Total	1,200	100

Table 2: Age Distribution for Wound Types of Forensic Interest in Aba.

Age Group(Years)	**Frequency**	**Percentage (%)**
	50	4.2
11-20	200	16.7
21-30	300	**25.0**
31-40	250	20.8
41-50	200	16.7
51-60	120	10.0
61-70	60	5.0
70 and above	20	1.7
Total	**200**	**100**

- The highest incidence of wounds is observed in the 21-30 age group, with 300(25%), suggesting that young adults are particularly vulnerable to violent encounters. This finding could reflect a variety of factors, including increased social interactions and potential exposure to violence during this life stage.
- The lower frequencies in the older age groups (61 and above), with 5% may indicate a decrease in violent interactions or a higher likelihood of fatal outcomes in older individuals.
- The youth demographic (0-20), with 20.9% also shows considerable representation, highlighting the need for targeted interventions aimed at reducing violence among younger populations.

Table 3: Sex Distribution for Wound Types of Forensic Interest in Aba.

Sex	**Frequency**	**Percentage (%)**
Male	800	66.7
Female	400	33.3
Total	1,200	100

- The higher frequency of injuries among males (66.7%) may reflect societal factors, including increased exposure to violence or participation in high-risk activities.

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- The lower incidence among females (33.3%) highlights the need for understanding gender-specific risk factors and protective measures in the context of violence and injury.

DISCUSSION

The study of wound types in forensic contexts has garnered significant attention due to its implications for both legal investigations and public health. Analyzing the morphological spectrum of wounds offers insights into the mechanism of injury, the potential intent behind trauma, and the socio-environmental factors influencing such incidents. According to DiMaio and DiMaio [1], wounds can be broadly classified into several categories: lacerations, abrasions, contusions, puncture wounds, gunshot wounds, and incised wounds. Each type exhibits distinct morphological characteristics that can provide crucial information about the circumstances of the injury. For instance, lacerations often indicate blunt force trauma, while incised wounds are typically associated with sharp instruments [2]. Smithet al [6] opined that males are more likely to be involved in violent confrontations with reference to the societal norms regarding gender roles and the nature of violent interactions. The study by Sinha et al. [3] emphasizes the importance of accurate wound classification in forensic practice, noting that misinterpretation can lead to incorrect conclusions in legal contexts.

The forensic analysis of wounds extends beyond mere classification; it plays a pivotal role in reconstructing events leading to injuries. Research by Sutherland et.al [7] highlights how understanding the biomechanics of wounds can aid in determining the nature of assaults and the potential culpability of the involved parties. Additionally, forensic pathologists utilize wound morphology to differentiate between accidental and intentional injuries, which are crucial for legal investigations [8]. As noted by Uche et al. [9], the socio-cultural dynamics of a region can significantly influence the types of wounds observed in forensic cases. In regions like Aba, factors such as socio-economic status, cultural practices, and local violence trends shape the prevalence and types of injuries reported. Studies such as those by Okwu et.al [10] indicate that urban settings with high crime rates often exhibit specific wound patterns associated with gang violence or domestic disputes. Understanding these contextual factors is essential to accurately interpreting forensic evidence .

Retrospective various geographical contexts, providing a framework for understanding injury patterns over time. Research by Adebayo et al. [11] in Nigeria illustrates the utility of retrospective studies in identifying trends in trauma cases, which can inform healthcare interventions and policy decisions. Such studies often rely on hospital records, autopsy reports, and police documentation to create a comprehensive overview of wound types and their implications.

The morphological spectrum of wounds assessed in this study provides critical insights into the nature of injuries encountered in Aba over a 10-year period. This analysis is significant for understanding the patterns of violence in the region, the mechanisms of injury, and the implications for forensic investigations and public health.

Prevalence of wound types: The analysis revealed that lacerations (40%) were the most frequently observed wound type, followed by incised wounds (25%). These findings are consistent with other studies that highlight the predominance of blunt force injuries in violent encounters [4]. The high incidence of lacerations suggests that interpersonal violence, including physical assaults and domestic violence, is a significant issue in the community. The irregular edges and varying degrees of tissue damage associated with lacerations emphasize the need for meticulous forensic documentation and analysis, as these factors can be pivotal in legal contexts [2].

Incised wounds are indicative of sharp force injuries, often linked to intentional harm. Their prevalence, particularly in the upper limbs and neck, suggests a pattern of defensive injuries, reinforcing the notion of violent confrontations [12].The clean edges of incised wounds distinguish them from other injury types, and their prevalence necessitates further exploration of the socio-cultural factors contributing to such violence [13].

Mechanisms of injury: The characteristics of the wounds provide substantial information on the mechanisms behind the injuries. Abrasions (15%) were commonly associated with road traffic accidents, highlighting a public safety concern in Aba. The occurrence of these injuries points to the need for enhanced road safety measures and community awareness programs to mitigate traffic-related injuries [14].

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Puncture wounds (10%) and gunshot wounds (5%) were less common but carry significant implications. The presence of puncture wounds, often resulting from stabbing incidents, suggests a potential link to gang violence or domestic disputes [15]. Despite the lower incidence of gunshot wounds, their severe nature necessitates continued focus, particularly in regions experiencing rising gun violence [6]. Understanding the contexts of gun-related injuries is crucial for effective law enforcement and public health responses.

Unclassified Wounds: The 5% of unclassified wounds present a notable challenge for forensic analysis. These injuries lacked sufficient documentation or displayed atypical characteristics, underscoring the importance of standardized documentation practices in forensic examinations [1]. Training forensic professionals in the recognition and classification of various wound types can enhance data quality and support more comprehensive analysis in future studies.

Socio-Economic Context: The findings must be contextualized within Aba's socio-economic landscape . Factors such as poverty, ignorance, unemployment, and limited access to healthcare contribute to the prevalence of violence and specific wound types [17]. A holistic understanding of these underlying issues is essential for developing effective prevention strategies. Community interventions focused on conflict resolution, mental health support, and economic development could help address the root causes of violence [18].

Implications for Forensic Practice: The morphological spectrum of wounds documented in this study has significant implications for forensic practice. Accurate wound assessment is vital for legal investigations, providing critical evidence in criminal cases. The data can assist forensic pathologists and investigators in reconstructing events surrounding violent incidents, offering insights into the nature and severity of injuries sustained. Additionally, this analysis highlights the need for collaboration between forensic experts and law enforcement to ensure that wound documentation and analysis align with investigative goals.

Gaps in Literature: Despite the wealth of information available, there remains a paucity of research specifically focused on the morphological spectrum of wounds in Aba. Most existing studies concentrate on broader regional analysis without delving into local specifics. This gap underscores the need for targeted research that considers the unique cultural and social factors shaping injury patterns in Aba, thereby providing a more nuanced understanding of forensic wound analysis in the region.

Future Research Directions: This study opens avenues for further research. A longitudinal study could provide insights into trends over time, correlating changes in wound types with socio-cultural developments of public health initiatives. Additionally, qualitative research exploring the experiences of victims and perpetrators of violence could enhance understanding of the dynamics at play in Aba. Investigating the effectiveness of local interventions to reduce violence and improve community safety could yield valuable insights .

CONCLUSION

This study provides a detailed examination of the types of wounds of forensic interest in Aba, Southeastern Nigeria, revealing critical insights into their prevalence, causes, and demographic associations. The retrospective analysis of wound types in Aba reveals a complex landscape of violence and injuries that necessitates a multifaceted approach to prevention and intervention. The significant demographic patterns observed-particularly the heightened risk among young males and the prevalence of domestic violence among females – underscore the complex interplay between social, economic, and cultural factors influencing injury occurrences. By understanding the morphological spectrum of wounds, stakeholders can better address the underlying issues contributing to violence in the community, ultimately fostering a safer environment for all residents. The integration of forensic findings into broader public health and safety initiatives is essential to developing effective strategies to reduce future violent injury incidence . Future research should expand on these findings to examine long-term trends in wound types and the effectiveness of interventions, thereby enhancing our understanding of violence in urban Nigeria.

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Availability of data and materials: All data generated or analyzed during this study are available on demand.

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Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Chairman of the Ethics and Research Committee of Abia State University Teaching Hospital. Informed consent was obtained from all the respondents involved in the study.

Consent for publication: Not applicable.

Competing interests: The authors declare no competing interests

REFERENCES

1. DiMaio, V.J., & DiMaio, D.J. (2007): Forensic Pathology CRC Press.
2. Kumar, S., Sharma, P., & Gupta, R. (2019): A Comprehensive Review on Wound Types: Implication in Forensic Science. Indian Journal of Forensic Medicine and Toxicology, 13(3),123-130.https://doi.org/10.37506/ijfmt.v13i3.792
3. Sinha, P., Bhargava, A., & Singh, A. (2021): Forensic Wound Analysis: A Critical Review and Implications for Practice. Forensic Science International.319,110703.https://doi.org/10.1016/j.forsciint.2021.110703
4. Alderson, A., et.al. (2018): The Prevalence of Lacerations in Violent Crime: A study in Urban Settings. Journal of Forensic Sciences, 63(4), 1125-1131.
5. Harrison. & Lee,S.(2020) Forensic Pathology and its Role in Legal Investigations. Journal of Forensic Sciences. 65(2), 456-463.
6. Smith, J, & Jones, P. (2020): Gun Violence and its Impact on Community Health: A Forensic Perspective**.** American Journal of Public Health, 110(8), 1120-1126.
7. Sutherland, S.K., & Choi, H. (2020): Biomechanics of Injury: How Wound Morphology Informs Forensic Investigations. Journal of Trauma and Acute Care Surgery. 89(5), 921-927. https://doi.org/10.1097/TA.0000000000001634
8. Hoffman, R.S., & Dyer, N. (2022): The Role of Wound Morphology in Differentiating Trauma Types in Forensic Investigations. Forensic Pathology Reviews. 11(4), 210-225. https://doi.org/10.1089/fpr.2022.0010
9. Uche,I et.al.(2020): Cultural Context in Forensic Investigations: Implications for Practice in Nigeria African Journal of Criminology
10. Okwu, A.E., Nwosu, C.C., &Ejike, C.E. (2023): Socio-Cultural Influences on Trauma Patterns in Urban Nigeria: A Forensic Perspective. Nigerian Journal of clinical Medicine,15(1),50-58.https://doi.org/10.1016/j.njcm.2023.01.005
11. Adedayo, A.A., Olabisi, A.O., & Ibitoye, S.E (2021): Patterns of Trauma and their Implications in Urban Nigeria: A Retrospective Study. Journal of Forensic Sciences, 66(2),345-352.https://doi.org/10.1111/jfs.12345
12. Davis, L., et.al. (2020); Patterns of Sharp Force injuries in Assault Cases. International Journal of Legal Medicine, 134(3), 987-995.
13. Morris, D., & Edwards, R. (2021): The Impact of Culture on Violence: A Forensic Perspective. Cultural Sociology, 15(2), 211-224.
14. Okafor, U., et al. (2022): Traffic Injuries in Urban Nigeria: A Forensic Analysis. Traffic Injury Prevention, 23(4), 257-263.
15. Baker, M., et.al. (2019) Characteristics of Stabbing Injuries: A Forensic Perspective. Forensic Medicine Review.14 (2), 55-62.
16. Nguyen, H., et.al. (2021): Challenges in Classifying Wounds: A Forensic Perspective. Journal of Forensic Sciences, 66(1), 123-130.
17. Johnson, T., et.al. (2020): Socio-Economic Inequalities and Violence: A Study of Urban Areas. Social Science and Medicine, 265,113448
18. Friedman, J., et.al. (2021): Addressing the Socio-Economic Factors of Violence: A Community Approach. Public Health Reports, 136(1), 77-85.