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Medico-legal evaluation of deficiencies in the definition of wound depth in forensic reports: a retrospective study

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ABSTRACT. – OBJECTIVE: One of the most important parts of accurate wound definition is wound depth. In our study, we aimed to reveal the deficiencies in the depth of wound definition in the general forensic examination forms prepared in the emergency services and to increase the awareness of the physicians responsible for preparing the general forensic examination form.

MATERIALS AND METHODS: In our study, we included cases from the years 2020 to 2021 that were evaluated by our team upon seeking assistance from the Department of Forensic Medicine at Tokat Gaziosmanpasa University Medical School. These cases involved requests for final forensic reports following injuries. The general forensic reports of the cases were scrutinized concerning wound identification and whether they provided information regarding wound depth in the identification process.

RESULTS: It was observed that 97 of 770 general forensic examination reports included a definition of wound depth. In only 27 of these cases, it was determined that the wound depth was specified in centimeters.

CONCLUSIONS: The lack of definition of wound depth in forensic examination reports is an important deficiency. Physicians working in the emergency department are required to provide detailed information about the depth of the wound when preparing a general forensic examination report since it affects criminal law. In cases where it is not possible to measure the depth, at least information should be given about the condition of the muscle and fascia and the subcutaneous course of the wound.

Key Words:
Wound depth, Legal process, Clinical forensic medicine.

Introduction

In forensic cases applied to emergency services, the preparation of a general forensic report containing a complete wound description and life-saving and therapeutic interventions is of great importance for the resolution of cases and the correct and complete conclusion of the legal process[1]. In the correct definition of wounds, the body area where a wound is located, its length, width, angles, the structure of the wound lips, the inside of the wound, its edge and periphery features, tail, and depth should be included[2]. One of the most important aspects of an accurate wound definition is wound depth. Wound depth, in addition to giving an idea about the object or factor that created the wound, also determines whether the injury defined in the Turkish Penal Code can be repaired with a simple medical intervention and whether it causes a life-threatening situation[2,3]. The term "simple medical intervention" is used in the 2nd paragraph of Article 86 of the Turkish Penal Code to refer to the mildest injury group in terms of legal punishment.

In Turkish forensic medicine practices, forensic medical evaluation and classification of wounds are carried out according to the guidelines for the evaluation of injury crimes defined in the Turkish Penal Code in terms of forensic medicine. If a person has a bone fracture or dislocation, muscle-tendon injury, major vessel and nerve injury, or internal organ injury, it is decided that the impact of the injury on the person is not mild enough to be eliminated with a simple treatment intervention. For other soft tissue lesions listed, a forensic medical decision is made according to the criteria determined in the abovementioned guidelines. In this context, even if there is no internal organ lesion, injuries that penetrate the chest and abdominal cavity are also considered life-threatening injuries as a forensic medical decision[4].

The expression related to crimes against bodily immunity is stated as follows: "In cases where the effect of the act of intentional injury on the person

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is so slight that it can be remedied with a simple medical intervention, upon the complaint of the victim, he is sentenced to imprisonment from four months to one year or a judicial fine"[3]. For injuries that cannot be treated with a simple medical intervention, the provisions in Article 86-1 of the Turkish Penal Code state the following: "Anyone who deliberately inflicts pain on someone else's body or causes his health or perception ability to deteriorate is punished with imprisonment from one year to three years"[3]. According to Article 87, if the act of intentional injury causes a situation that endangers the life of the victim, the penalty determined will increase by one-fold[3]. As a result, the concepts of "whether the injury can be eliminated with a simple medical intervention and whether it causes a life-threatening situation" are important in terms of legally affecting the punishment to be given to the perpetrator from a legal perspective.

In order to meet the legal requirements defined above and for the justice system to function properly, physicians who first examine the victim must record wound descriptions accurately and in detail. When defining wounds resulting from various traumas, one of the most difficult to define and overlooked parameters is wound depth and tract. The presence of multiple wounds, the need for urgent medical intervention, physicians' lack of sufficient knowledge about the forensic medical approach, and their inability to foresee the legal consequences of this issue can be considered among the reasons for this deficiency. This deficiency in general forensic examination forms causes significant difficulties when making decisions in later forensic medical evaluations[5].

This study aimed to reveal the deficiencies in the definition of wound depth in general forensic examination forms prepared in emergency services, to increase the awareness of physicians responsible for preparing these forms, and to discuss the issue in the light of the literature.

Materials and Methods

For this study, approval was obtained from the Clinical Research Ethics Committee of the University of Gaziosmanpasa on 22 November 2022 (Approval No. 22-KAEK-219).

Cases that made a request to the Tokat Gaziosmanpasa University Faculty of Medicine, Department of Forensic Medicine between 2020 and 2021 for an examination and a final forensic report after injury were included in this study. The cases included the following information: age, gender, at which health institutional level the general forensic examination form was prepared, the type of event that caused the injury, the object that caused the injury, the definition of the wound in the general forensic examination form, whether information about the wound depth was given in the definition, whether depth was given in centimeters in the wound definition, and the injury examined in terms of region and type of injury.

Statistical Analysis

Descriptive analyses were performed to determine the general characteristics of the study groups. Data on the continuous variables were in the form of mean ± standard deviation and median minimum and maximum values, while data on the categorical variables were given as numbers (%). Ready- made statistical software SPSS 22.0 (IBM Corp., Armonk, NY, USA) was used for calculations.

Results

Of the 770 cases that requested a final forensic report after injury, 605 (79%) were male, and 165 (21%) were female. The mean age of the cases was 34.7 years. The youngest case was one year old, and the oldest was 88 years old. The general forensic examination forms were prepared by the tertiary health service units for 40 cases, by the secondary health service units for 354 cases, and by the first-step health service units for 7 cases.

In the overall forensic examination forms categorized by case type, the highest number of cases, totaling 387, resulted from assault and force, followed by 182 cases attributed to traffic accidents, 112 cases from sharp injuries, 54 cases from gunshot wounds, 21 cases from falling from a height, and four cases from animal attacks. Moreover, 283 cases were caused by battery without using weapon-like objects. Among the cases that applied as a result of traffic accidents, 97 had in-vehicle traffic accidents, 44 were non-vehicle traffic accidents, and 41 were motorcycle accidents. In addition, 74 cases were caused by knife injury, and 54 cases were caused by firearm injury. Among the cases, 430 had a wound description in the general forensic examination forms (56%), 293 did not have a wound definition (38%), and 47 did not have any injuries.

In 97 of 770 cases (12.6% of the total cases), the definition of wound depth (using expressions such as muscle penetration, tendon incision, deep

Table I. Expressions used to describe the wound in cases where wound depth is defined in general forensic examination forms.

Expressions used to describe the wound in cases	The number of general forensic examination forms
Deep wound	36
Muscle damage	18
Internal organs or vessels damages	16
Reaching body cavities	12
Forming bone fractures	10
Tendon damage	5

wound, etc.) was included in the general forensic examination forms. The term "deep wound" was used to describe wounds in 36 cases in which wound depth was defined in general forensic examination forms. The expressions "muscle damage" in 18 cases, "injury of internal organs or vessels" in 16 cases, "reaching body cavities" in 12 cases, "forming bone fractures" in 10 cases, and "tendon damage" in 5 cases were used (Table I).

Among the cases in which wound depth was defined, 37 were caused by a sharp object, 28 by a traffic accident, 19 by a firearm, 5 by a blunt object, 3 by a glass cut, 3 by a blow without using a weapon, and 2 by a dog attack (Table II).

Wound depth was stated in centimeters in 27 of these cases. In any of the cases in which wound depth was specified in centimeters, no information was given about the depth measurement method and the anatomical layer to which the wound reached. Among these cases, 11 were injured in the lower extremities, 8 in the face, 7 in the upper extremity, 6 in the back region, and 2 in the scalp. Moreover, 13 cases were injured with a knife, 4 with a firearm, 3 with beating without using a weapon, and 2 with glass.

Discussion

In forensic cases, the localization of wounds, their size, depth, and shape characteristics give information about the severity of the trauma, the time of the trauma, the kind of object that created the trauma, and the manner and purpose of the event[5]. The medical or surgical treatment applied after the injury and the healing process that continues with time through the event changes the wound characteristics[6]. In forensic medicine units, it is difficult to comment on the injury event by evaluating the existing wound characteristics without knowing the original wound characteristics in the issuance of the final forensic report[7].

One prevalent deficiency observed in wound definition during practice is the lack of or incomplete and inaccurately defined wound depth in general forensic examination forms. The wound depth should be defined as much as possible by the physician who first examines the victim, both metrically and as the anatomical layer to which the wound reaches. Because metric measurements can be a guide in identifying the event or crime tool that caused the wound. So, metric measure-

Table II. The number of general forensic examination forms stating the cause of the wound in cases with a definition of wound depth.

Cause of the wound	The number of general forensic examination forms
Sharp object injury	37
Traffic accident	28
Firearm injury	19
Blunt object injury	5
Glass cut	3
Blow without using a weapon	3
Dog attack	2

ments can contribute to the legal process by helping to identify the event or crime tool that caused the wound and to reveal the criminal act accurately and clearly. In addition, identifying and recording the anatomical layers through which the wound penetrates will enable the severity of the injury to be defined in terms of Forensic Medicine and the Turkish Penal Code[3].

In our study, the number of general forensic examination forms containing information about wound depth was very low. Wound depth was specified in centimeters in only 27 (3.5%) of the 770 general forensic examination reports evaluated. This number corresponded to 6.2% of 430 cases with wound definition. An explanation of the wound depth was given in 97 cases, but none was given in 673 cases (87%). The rate of cases with no explanation of wound depth is very high. To compensate for the deficiencies in the definition of wounds in the general forensic examination reports and patient observation documents, the item on the Guidelines for the Forensic Evaluation of Injury Crimes Defined in the Turkish Penal Code page 17 explanation 2 has been added: "In practice, the depth of sharp wounds in emergency services, whether they reach the fascia and muscle tissue, is mostly not recorded. In such cases, the depth of the wound described by the structure of the body region and the nature of the injury (number of wounds, their length, being vertical or oblique to the muscles, etc.) should be determined, and it should be decided that the effect of the injury on the person is not so mild that it can be eliminated by a simple medical intervention by justifying it. If the clinical findings do not contain any description of the nature of the injury, it should be decided that the effect of the injury on the person is mild enough to be eliminated by a simple medical intervention"[3]. As a result of the injury, a final forensic report is requested by the prosecution office. This article, which was created to help physicians who are required to issue a final forensic report not to be in a difficult situation during the decision stage and to help them form an opinion, aimed to enable criminal law to progress more accurately. However, in cases in which the wound depth is unknown, there is a possibility that injured people will lose their rights. In order to evaluate the injured crimes defined in the Turkish Penal Code, there is no information about the depth of the wound in the general judicial examination forms. However, the explanation is not a complete solution to make up for the deficiency in this regard. Not specifying the wound depth and its relationship with deep structures creates a problem for physicians and forensic medicine physicians who issue the final forensic report. In cases in which wound depth is not defined in the general forensic examination form, the results of the final forensic report are prepared by applying the items specified in the forensic evaluation guide for wounding crimes defined in the Turkish Penal Code[3]. In cases in which the result is undecided, the opinion of the emergency physician who first saw the wound is asked. However, the physician usually does not fully remember the characteristics of the wound because a long time has passed since the first examination. Furthermore, due to the healing process of the wound and the medical interventions to it, the wound loses its initial characteristics, and the correct result cannot be reached with subsequent evaluations. For this reason, it is important for the physician who sees the wound for the first time to define the first wound correctly[1].

Some studies[5-8] have revealed the importance of this situation. In a case under consideration[10], a 21-year-old male sustained injuries from physical assault and a sharp object, prompting a request for a forensic report from the forensic medicine unit. However, his medical records failed to specify whether there was a muscle incision, and there was no information regarding the trajectory beneath the skin. The details of his wound were compromised, as the incident had occurred 2.5 months earlier. Consequently, a determination regarding whether the injury was superficial enough to be treated with a simple medical intervention could not be made[8]. The orthopedic department was consulted, magnetic resonance imaging was taken, and the wound was found to be muscle-penetrating as a result of the radiological evaluation. In cases in which an appropriate and detailed wound definition was not made by the physician who performed the first examination, labor, cost, and time loss could be experienced.

Physicians who are responsible for issuing general forensic examination reports and who encounter forensic cases for the first time must accurately describe the initial state of the wound and record it appropriately to correctly interpret and report the incident during the forensic investigation[1]. In defining the wound, they should also specify information about its depth in detail, which determines whether the injury can be remedied with a simple medical intervention and whether it is life-threatening. In cases brought to the emergency department, the wound depth cannot always be evaluated in detail because the wound site is sensitive and painful. In wound

examination, it is important to define the severity of the wound and the type of instrument that created the wound[9]. In defining the wound in the general forensic examination form, the severity of the wound, the cause of the wound, and, if any, the type of instrument and/or trauma that created the wound should be recorded. In our study, in defining the wound depth in the general forensic examination forms prepared in emergency services, the most frequently used expression was "deep wound". The term "deep wound" does not fully correspond to wound depth. Instead of indicating "deep wound," it would be more accurate to define the condition of the structures damaged by the wound, such as muscle, fascia, internal organs, and penetration into body cavities, which affect the concepts of a simple medical intervention and a life-threatening situation.

In cases in which wound depth was defined and measured in centimeters, the most detailed information about the cause of the wound was given in the wounds caused by sharp objects. Among the cases in which information about wound depth was given, the most common information was given regarding injuries caused by sharp objects and firearms because emergency physicians know the legal importance of this information. However, there is a profound effect on injuries other than those caused by sharp objects and firearms[10]. In other injuries not caused by sharp objects or firearms, information should also be given about wound depth.

In cases in which the victims died due to injury, to preserve the original state of the wound, defining the wound depth in detail and specifying it in centimeters should be avoided to prevent compromising the forensic investigation. Although the determination of the wound depth in centimeters does not directly affect the concepts of a simple medical intervention or a life-threatening situation, it can provide important information about the length of the instrument used to create the wound. A wound depth greater than a muzzle length can be seen in areas of the body that can stretch, such as the abdomen and chest[9]. It is not correct to comment on wound depth and instrument size as a result of the stretching effect in chest and abdominal injuries. However, comments about the wound depth and the size of the instrument used, especially in areas where the subcutaneous tissues are tighter (e.g., the extremities), are important in the forensic resolution of the case. To measure depth, sterile cotton-tipped swabs or centimeter-marked plastic probes can be used. The measurement should be done gently so as not to widen the wound and damage the tissues at the base of the wound. Wound depth should not be measured with a stylet or a hard object. The wound depth and the tissue under the wound can be interpreted using two- and three-dimensional radiological methods[11,12]. In cases in which measuring the depth is not possible, at least information about the condition of the muscle and fascia and the subcutaneous course of the wound should be given. Information should also be given about the skin and subcutaneous course of the wound and the condition of the muscle, fascia, and vital organs.

Conclusions

In conclusion, incomplete or erroneous reports may cause delays in judicial proceedings, victimization of patients, and wrong decisions. Physicians who are tasked with preparing forensic reports should know the importance of the forensic and medical dimensions of wounds. Necessary training on the importance of wound definition and how to make appropriate wound definitions during emergency services when there is frequent circulation of physicians working due to appointment processes and displacement due to the medical specialization examination should be given at regular intervals. These trainings should emphasize how forensic reports should be prepared and what legal consequences could be caused by incomplete or erroneous reports. Moreover, they should increase physicians' awareness of cause-and-effect relationships.

Conflict of Interest
The authors declare that they have no conflict of interest.

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Informed Consent
The authors declare that the patients included in the study signed informed consent forms to allow their medical information to be used in research.

Ethics Approval
The study was conducted according to the guidelines of the Declaration of Helsinki, and Tokat Gaziosmanpaşa University Faculty of Medicine Dean's Office Clinical Research Ethics Committee dated 22.11.2022 and approval No.: 22-KAEK-219.

Authors' Contributions

Conceptualization: Selcuk Cetin and Sertac Dalgic; methodology: Selcuk Cetin; software: Selcuk Cetin and Sertac Dalgic; validation: Selcuk Cetin and Sertac Dalgic; formal analysis: Sertac Dalgic; investigation: Selcuk Cetin and Sertac Dalgic; resources: Selcuk Cetin and Sertac Dalgic; data curation: Selcuk Cetin and Sertac Dalgic; writing – original draft preparation: Sertac Dalgic; writing – review and editing: Selcuk Cetin; visualization: Selcuk Cetin and Sertac Dalgic; supervision: Sertac Dalgic; project administration: Selcuk Cetin; funding acquisition: Selcuk Cetin.

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Data Availability

All data presented here are available from the authors upon reasonable request.

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