



H10 The Analysis of Pattern Injuries From Blunt Trauma and Sharp Force in a Forensic Case of Homicide: An Experimental Study Using a Pig Head Model

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After attending this presentation, attendees will be able to describe the impact of an experimental study using pig head models in order to identify the compatibility of injuries produced compared to those found on the victim.

This presentation will impact the forensic science community by demonstrating the importance of the correlation between the analysis of pattern injuries and weapon identification.

Blunt trauma can have various patterns. Each injury is different depending on the nature and mass of the weapon and on the force and manner employed. Difficulties arise in the identification of the weapon, in checking the compatibility with the injury, in the determination of the acting force, and in the discrimination of each injury. Investigations are complicated by the use of different weapons at the same time. Therefore, it is necessary to analyze injury patterns by replicating each wound on an experimental model, similar to a human one. In the literature, several studies have used pig bones in order to evaluate various injuries or to reproduce particular conditions, such as for burn injuries.

Often, it is difficult to determine the nature of the injuries, especially when they are multiple, overlapping, and made by blunt objects with an unidentifiable shape. The forensic pathologist must answer questions about the weapon used and is not always able to do so. Detecting the weapon is crucial and investigators search for it at the crime scene or where the attacker may have thrown it away. The pathologist's tools are experimental, especially when the weapon is not found or many weapons have been used. The autopsy is fundamental, as is the analysis of the margins, shape, and morphology of each injury.

A woman was found dead in her apartment with multiple wounds on her chest, head, face, and hands. An inspection was conducted during which all rooms were evaluated to find the crime weapon(s). In a wardrobe, knives were found wrapped in cloths and a cloth of the same color was found on the bed. All of the knives found did not show blood spots or latent traces. At the autopsy, the victim exhibited 11 injuries with clear and infiltrated margins attributable to 11 stab wounds from a cutting weapon. Only three of them were penetrating: one on the chest that lacerated the left lung and two on the right side and abdomen with hepatic lacerations.

Head injuries were present as a result of multiple stab wounds on the same point. There were 20 such injuries; each had indented margins, infiltrated with rounded and convex features, totally different from cutting injuries. These injuries exhibited multiple underlying cranial fractures attributable to the use of a blunt object repeatedly coming into contact with the head of the victim (ascertained by analyzing the victim's position at the inspection), first on the occipital region, then on the right temporo-parietal region. An experimental study was conducted on pig heads obtained from a slaughterhouse in compliance with animal experimentation regulations. Each head was placed on a cloth. Metallic and wood cutting and blunt weapons were chosen. Among the blunt objects classified and measured were: various hammers, metal pipes, screwdrivers, pipe wrenches, sticks, bats, picks, shovels, and hoes. Among the cutting weapons chosen were: single- and double-edge cutting knives, clasp knives, cleavers, and various kitchen knives. All the weapons were tested on pig skin. Head blows were made by a subject of the same weight and height as the suspect, with his right and left hand. Each injury was photographed and measured. From the comparison of the data emerged a compatibility of cutting wounds due to a single-edge cutting knife, with similar morphological characteristics compared to the victim's injuries. The analysis of blunt weapons exhibited a compatibility with metallic pipe injuries with the same rounded and convex morphology of multiple and overlapping wounds found on the head and face of the victim. This study has proven that the injuries were attributable to the use of two distinct weapons with different traumatic mechanical actions and that the aggressor used stronger force on the head with the metal tube, causing multiple cranial fractures. These data allowed for the detection of the inconsistencies declared by the aggressor and the discovery of the weapons that had been discarded in the countryside.

Forensic Science, Blunt Trauma, Pig Head Model