

# Wound Ballistics: The Latest Clinical Information

Kim Ozano\*

Editorial Office, Journal of Forensic Pathology, UK

## Corresponding Author\*

Kim Ozano

Editorial Office, Journal of Forensic Pathology, UK

E-mail: forensics@theresearchpub.com

Telephone: +44 7915641605

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**Received:** 07-JAN-2022, Manuscript No. JFP-22-20027; **Editor assigned:** 09-JAN-2022, PreQC No. JFP-22-20027 (PQ); **Reviewed:** 23- JAN -2022, QC No. JFP-22-20027 (Q); **Revised:** 28- JAN -2022, Manuscript No JFP-22-20027 (R); **Published:** 07-FEB-2022, doi: 10.35248/2648.1312.22.7(1).116

## Abstract

This paper describes the phenomena of eponymous terminology in forensic pathology. The authors found several eponymous terms by examining sample textbooks (monographs) on forensic pathology written in both English and German. The reader will be introduced to the most significant eponymous terminology in forensic pathology in this essay. The following terminology are mentioned in the paper: Wydler's Sign, Tardieu's Spots, Wischnewski Spots, Casper's Rule, Kronlein's Shot, Lichtenberg's Figures, Nysten's Law, Paltauf's Spots, Simon's Sign, Sveshnikov's Sign, Beckwith's Sign, Simon's Sign, Casper's Rule, Kronlein's Shot, Lichtenberg's It is explained how eponymous phrases have propagated across several languages. The linguistic foundation of such phrases, as well as their benefits and drawbacks in specialised fields and even more general contexts, are examined. According to the authors, the major purpose of these phrases is to make it easier for scholars to freely exchange clear information. In forensic pathology, eponymous phrases are typical of the German-speaking nations and of other nations that have been affected by the German school. Since their use is far less common in the AngloSaxon world, they are not frequently found in English textbooks and monographs.

## Introduction

Definitional concepts called eponyms are derived from proper names. They are used as names for anatomical structures, surgeries, treatment modalities, numerous pathological states, symptoms, syndromes, tests, laboratory procedures, medications, equipment, etc. in all disciplines of medicine. The purpose of this article is to introduce fundamental eponymous terminology used in forensic pathology literature. Analysis was done on representative forensic pathology textbooks (monographs). We focused on books in English and German, including *Forensische Medizin für Studium und Praxis*, *Forensische Medizin für Studium und Praxis*, *Knight's Forensic Pathology*, *Spitz and Fisher's Medicolegal Investigation of Death*, *Sudden Death in the Young*, *Handbuch gerichtliche Medizin*, *Vademecum Gerichtsmedizin*, and *Praxis Rechtsmedizin*. We found some frequently used eponymous terms in the textbooks. They appear in different numbers in the monographs. The words Beckwith's Sign, Lichtenberg's Figures, Puppe's Rule, Paltauf's and Tardieu's Spots are presented in representative English monographs (*Knight's Forensic Pathology*, *Spitz and Fisher's Medicolegal Investigation of Death*, *Sudden Death in Young*) [1,2].

absent amount of petechiae along the brachiocephalic vein in the rear upper part of the thymus. The local protective function of the aforementioned vein prior to increases in intra-thoracic pressure provides an explanation for this phenomena [3].

German medical examiner Johann Ludwig Casper (1796–1864) was born in Germany. In his book *Praktisches Handbuch der gerichtlichen Medizin*, 2 Band from 1858, he described the patterns of putrefactive decay in the human body (Berlin 1858). Carl Liman, a well-known German medical examiner, was his nephew (1818–1891). The rate of putrefaction of human bodies in the air, water, and subterranean is determined by Casper's rule (approximately 8:2:1). The different concentrations of oxygen in the air, water, and subsurface account for the variations in the rate of putrefactive changes [4].

German surgeon Rudolf Ulrich Kronlein (1847–1910) was well-known. Prof. Kronlein published his account of brain evisceration caused by a gunshot wound to the skull in 1899 in *Beitrag zur Lehre der Schadel-Hirnschuisse von unmittelbarer Nahe mittels eines Schweizerischen Repetier-Gewehrs Model 1889*. In high velocity brain missile injuries (muzzle velocity [600-800 m/s] during close-range firing), Kronlein's shot (evisceratio cerebri sclopetaria totalis) denotes a prolapse of an intact brain hemisphere or, more rarely, of both brain hemispheres. This phenomenon was initially discussed in relation to head wounds caused by gunfire during combat. The intense expansion of muzzle gases in the skull cavity explains Kronlein's shot. German physicist and scientist Georg Christoph Lichtenberg was born in 1742 and died in 1799. Lichtenberg first identified the distinctive branching pattern that occurs in solid materials under high voltage conditions in 1799. The injuries caused by high voltage lightning or electric shock firing are known as Lichtenberg's figures, sometimes known as lightning figures or keraunographic signs. This phenomenon was initially discussed in relation to head wounds caused by gunfire during combat. The intense expansion of muzzle gases in the skull cavity provides an explanation for Kronlein's shot [5].

France's Pierre Hubert Nysten (1771–1818) was a physiologist and doctor. The postmortem muscle stiffness phenomenon was first scientifically reported by Nysten in his 1811 book *Recherches de physiologie et de chimie pathologique* (Paris 1811). Nysten's Law states that postmortem muscle stiffness increases from the head downward (in craniocaudal direction). The masticatory muscles become rigid first, and then the facial and neck muscles follow [6]. Finally, the upper and lower extremities begin to stiffen. This "descendent" sort of muscular stiffness is typical. Medical examiner Arnold Paltauf was an Austrian from 1860 to 1893. Paltauf served as a professor at the German Charles-Ferdinand University in Prague from 1891 until 1893. Petechial haemorrhages were mentioned by Arnold Paltauf in the 1888 book *Über der Tod durch Ertrinken*. Suffusiones subpleurales pulmonum, also known as Paltauf's spots, are petechial haemorrhages that develop beneath the pulmonary pleuras in both lungs during wet drowning. Due to hemolysis, Paltauf's patches are bigger and less clearly defined than Tardieu's. They are also known as Rasskazov-Lukomskij spots in the literature, after the two authors who first reported them 28 and 19 years, respectively, before Paltauf [7].

This phenomena was described by Lukomskij (1841–1866) in the 1869 work *O pjatnach Tardmje pri zadusenii*. Medical examiner Arnold Paltauf was an Austrian from 1860 to 1893. Paltauf served as a professor at the German Charles-Ferdinand University in Prague from 1891 until 1893. Petechial haemorrhages were mentioned by Arnold Paltauf in the 1888 book *Über der Tod durch Ertrinken*. Suffusiones subpleurales

pulmonum, also known as Paltauf's spots, are petechial haemorrhages that develop beneath the pulmonary pleuras in both lungs during wet drowning [8]. Due to hemolysis, Paltauf's patches are bigger and less clearly defined than Tardieu's. They are also known as Rasskazov-Lukomskij spots in the literature, after the two authors who first reported them 28 and 19 years, respectively, before Paltauf. This phenomena was described by Lukomskij (1841–1866) in the 1869 work *O pjatnach Tardmje pri zadusenii*. A renowned German social physician and medical examiner, Georg Puppe (1867–1925). In the article *Traumatische Todesursachen* published in the year 1903's *Gerichtliche Medizin*, Puppe discussed the significance of fracture principles as they pertain to the skull. In circumstances of multiple-shot injuries to the skull (a flat bone), Puppe's rule is applicable. When this occurs, the fracture lines formed by each subsequent shot only reach the fractured lines left by the prior shot(s), never crossing them or continuing over them (this typically occurs with injuries caused by blunt items) [8,9].

## Discussion

Particularly old titular phrases with definite meanings that have been documented in representative textbooks and encyclopaedias have their proper position in forensic science. The historical circumstances of each nation influenced the development and use of these names. Clinical Update: Gunshot Wound Ballistics The major linguistic advantages of eponyms, such as Simon's Sign rather than haemorrhage beneath the ligamentum longitudinale arterius, are their economy and simplicity in terms of memory. The use of capital letters, italics, and bold print in proper names makes eponymous nouns stand out in writings. They stand out due to their unique form when contrasted to conventional phrases [10].

Most erudite scholars who are accustomed to utilising them regularly utilise special eponymous phrases. Explicit explanations are preferred outside of this group of academics. These ecchymoses are a common feature of the so-called visceral congestion syndrome and are not pathognomonic only for mechanical causes of asphyxia. Vibices on the skin are frequently mistaken for Tardieu's spots in Anglo-Saxon medico-legal literature. Additionally, Tardieu syndrome is occasionally used in the literature to refer to battered child syndrome. The Newsletter for Hygiene, Legal and Practical Medicine published a description of haemorrhages and erosion of the gastrointestinal mucosa in deaths related to hypothermia in 1895. The link between hypothermia and the existence of these erosions was first identified by Visnevskij in 1886. Petechial haemorrhages and erosions in the stomach and duodenal mucosa known as "Wischnewski spots" are signs of hypothermic death. Eponymous terms' primary purpose is to encourage the free exchange of clear knowledge among academics. When non-medical researchers work with forensic pathology, eponymous words should not be a communication barrier (judges, police, prosecutors, lawyers etc.).

1. Both textbooks and academic publications in forensic pathology use eponymous words.
2. The German forensic pathology literature frequently uses eponymous terminology.
3. When employed by academics outside of the medical field, eponymous words must not represent a communication barrier.
4. The use of eponyms in scientific communication is appropriate [11].

## Acknowledgments

We thank the patient for allowing the case description.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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