



Homicide by non-lethal strangulation followed by accidental drowning during the cleaning of the unconscious victim

Nina Sophia Mahlke^{a,*}, Stefanie Ritz-Timme^b, Benno Hartung^a

^a Institute of Legal Medicine, University Hospital Essen, 45147 Essen, Germany

^b Institute of Legal Medicine, University Hospital Düsseldorf, 40225 Düsseldorf, Germany

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ABSTRACT

A case of accidental fatal drowning after non-lethal strangulation by a cable is presented. Random circumstances, which are highlighted here, led to the fact that signs of strangulation and rape were either superimposed or left almost no traces. The autopsy did not reveal typical signs of drowning, strangulation or other violence and the cause of death initially remained unclear. Histological examinations showed an acute emphysema and marked blood congestion. Swabs were i.a. taken from the genital area and molecular genetic analyses of the contacted persons were performed, which pointed to a craftsman. The crime was finally confessed by this craftsman. Obviously, the victim drowned unnoticed by the perpetrator when he tried to clean her from molecular genetic traces.

Introduction

Death by violent asphyxia with discrete or missing external and internal findings, e.g. suffocation by soft covering, are a common challenge in daily practice. If death occurs by strangulation or drowning, typical findings can be found in many cases. For example, in the case of violence against the neck, there may be i.a. hemorrhages in the skin or soft tissue, ligature marks on the neck and a congestion syndrome [1,2]; in the case of drowning, there may be i.a. froth in the airways and three-layered stomach content (Wydler-sign) [3].

The authors present a case of accidental fatal drowning after a non-lethal strangulation by a cable with non-specific findings.

Case presentation

A 25-year-old female (169 cm, BMI (body mass index) 29.4 kg/m²) was found dead in her apartment after her family was no longer able to contact her. She was lying in supine position in the empty bathtub with her legs drawn up. Froth was visible in the nose and mouth area (Fig. 1). The position of the head was near the lowest point of the bathtub (outlet). The water was turned off. The victim's hair was dry. The bathtub plug was lying on the rim. The apartment was moderately tidy, there were no signs of burglary. There was no evidence that the victim might have had any visitors.

Autopsy results

In addition to the finding of froth in the nose and mouth area, external postmortem examination revealed marked congestion of the head, neck, upper chest, and shoulder areas consistent with the supine position. The inner eyelids showed petechiae. The skin of the neck area was inconspicuous; there were neither ligature marks nor hemorrhages in the skin or soft tissue. No immersion signs, such as wrinkled changes of the skin, were found. No putrefaction was seen. Isolated hematomas were found i.a. on the inner side of the left upper arm and on the outer side of the right upper arm. The inner sides of only the labia majora exhibited symmetrical, reddish desquamation of max. 4 × 1 cm. No other evidence of blunt force trauma was found.

Relevant interior findings were several patchy dark red hemorrhages (approximately 0.3 cm in diameter each) in the laryngeal mucosa, dark red hemorrhage (1.5 cm in diameter) of the esophagus below the larynx and patchy dark red hemorrhages (affected area 1 cm in diameter) in the upper anterior portion of the froth filled trachea. The lungs were voluminous and showed watery cut surfaces (right lung 600 g, left lung 550 g). The pancreas exhibited multiple hemorrhages as well as the intestinal serosa.

No three-layered stomach content, no fluid in the sphenoid sinuses and no paltauf spots were found. There were no cutaneous or mucosal bleedings in the anogenital region. A complete soft tissue preparation

* Corresponding author.

E-mail address: ninasophia.mahlke@uk-essen.de (N.S. Mahlke).

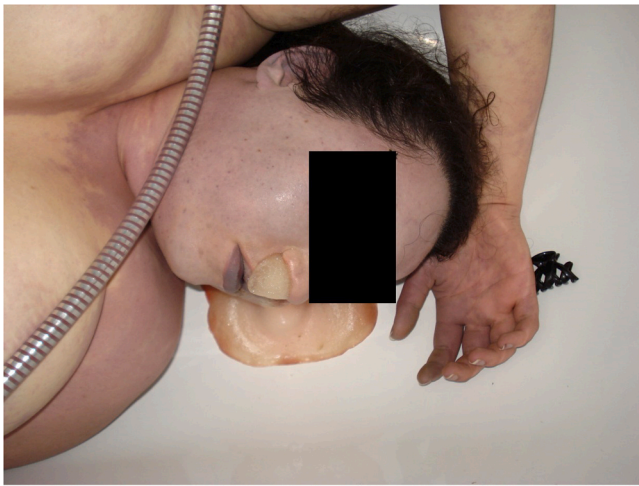


Fig. 1. Finding situation in the bathtub with froth and clear congestion of the parts of the body near the head.

was performed which showed discrete hemorrhages in the subcutaneous fat tissue in the areas of the above-mentioned hematomas on the left upper arm and right upper arm. The skeletal system was intact, including the hyoid bone and larynx.

Due to the suspicious findings, swabs were i.a. taken from the genital area before performing the autopsy.

Histopathological findings

Histopathological examinations revealed an emphysema aquosum with flattened interalveolar septa, stump-like cavity margins, and pulmonary dysemia (Fig. 2a and b) as the main finding. Additionally, marked blood congestion of the interior organs was seen, in several organs with fresh bleedings. The other organs showed no pathological changes.

Toxicological findings

Common general unknown screening was unsuspecting and did not reveal any evidence of a relevant substance uptake.

Results of molecular genetic examinations

Swabs from the genital area revealed a male DNA profile. Molecular genetic analyses of swabs taken from contact persons resulted in a match with a man who temporarily worked as a craftsman in the house in which the victim's apartment was located.

Confession of the suspected craftsman

After initial denial, the man confessed that he had met the woman by chance in the course of his work. He presented the events as follows: While he had still been at work, he rang her doorbell, pushed her into her apartment, and unresistingly raped her vaginally for about 5 min until he ejaculated. During the rape, the woman supposedly cried and begged him to leave her alive. Afterwards he asked her to clean herself and the victim finally fled from the apartment. He stated to have forcibly pushed her back into the apartment and punched her twice into the face. She then laid on the bed in a prone position. He sat down on her, took an electric cable and strangled her for about 5 min. He stated that he heard a loud cracking sound right before the victim collapsed. Her head was described as bluish. He put the woman in the bathtub and let the water in to clean her skin. He then let the water out and rinsed her vagina. He said to have inserted the shower head at least 10 cm deep into the vagina.

Discussion

After the autopsy, the cause of the froth of the lung edema could not be determined based on macroscopic findings only. Drowning, intoxication and sudden cardiac death were taken into consideration and further investigations were recommended. Autopsy and histopathological findings, and the finding situation (bathtub) led to the diagnosis "drowning". The peculiarity of this case lies in the fact that an essential part of the confession (strangulation) could initially not be derived from the findings. The question arose, if the post-mortem findings could be reconciled with the information provided by the perpetrator.

First of all, it has to be mentioned that the incidentally chosen supine position in the bathtub with the drawn legs could theoretically explain the present congestion in the head, neck and chest area as well as at least some conjunctival petechiae, whilst clear injuries on the neck were not present. A complete lack of external injuries is all the more remarkable because the perpetrator confessed to a five-minute lasting, substantial strangulation event with loud cracking (until now, this described cracking sound could not be explained by a morphological finding). Probably, a rare single case constellation is present, whereby the stocky, adipose constitution of the victim, an assumed sweating process, and a smooth surface electric cable may have worked synergistically. In addition, the perpetrator admitted sitting on the victim, therefore vital restrictive asphyxia must be considered, perhaps of the type of so-called 'burking'. Burking describes a thorax compression with (restrictive and obstructive asphyxia) or without (restrictive asphyxia) oronasal occlusion using soft covers, depending on the definition used [4–6]. Burking is rare, but not completely unseen [7]. The froth in the nose and mouth area, the marked congestion of the head, neck, upper chest, and shoulder areas and the petechial hemorrhages in the inner eyelids could be caused by such a mechanism.

Basically, it is possible to homicidally strangle a person without a morphologic correlate in the neck region, but these cases mostly refer to

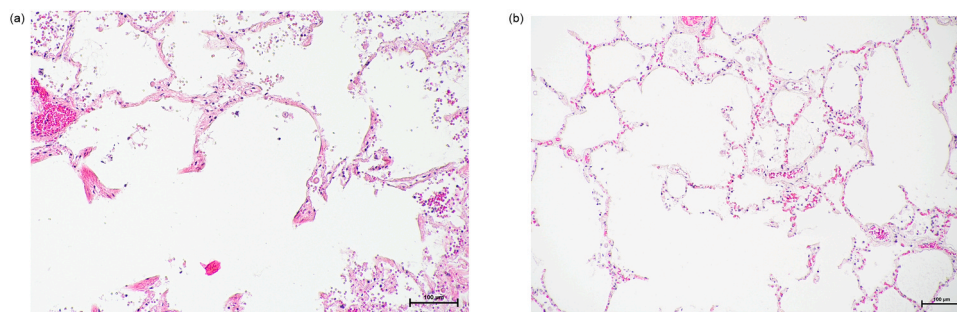


Fig. 2. a and b: Emphysema with focal dilatation of the alveoli; H&E (hematoxylin and eosin) staining, bar indicates 100 μ m.

the use of broad and soft ligature [1]. In a comparison of homicidal and suicidal strangulation deaths [8], clear external strangulation marks were found in around 80 % of those killed. Nearly 20 % of homicide victims showed no internal neck injuries at autopsy. Furthermore, homicidal strangulation cases without neck injuries, although very rare, have been described before [9], but not cases with an electric cable.

The onset of strangulation-evoked unconsciousness of the victim was apparently mistaken from the perpetrator for the onset of death. Death obviously occurred later on during body cleaning measures in the bathtub.

Death by drowning shows some typical but non-pathognomonic findings and is usually a diagnosis of exclusion. However, the presence of froth at the mouth and nostrils in combination with acute emphysema aquosum and dysemia are clear indicators of drowning - especially, as the circumstances of the finding situation matched up [10]. The histological slides of the lungs may have been so pronounced because the victim was unconscious in the bathtub while the bathtub slowly filled up – probably with preserved breathing. The absence of other usual findings in drowning, e.g. Wydler-sign, may be due to unconsciousness of the victim after the reported strangulation.

The rape process is said to have taken place without the use of force, so that the desquamation on the inner sides of the labia majora is more likely the result of the perpetrator's cleaning measures rather than the rape process itself. As it was a hot summer day and the labia majora were uncovered, the symmetric desquamation of the labia majora were not considered primarily suspicious for a rape. In any case, the sperm in the vagina could not be washed out completely, despite the alleged forcible insertion of the shower head into the vagina.

Conclusions

Concludingly, findings could be reconciled with the confession. Obviously, unique different coincidental circumstances helped to initially conceal the act. The described case illustrates that even after a strangulation with an electric cable for several minutes, skin and tissue findings in the neck area can be missing. This highlights the importance of a detailed autopsy and further investigations.

Ethics approval and consent to participate

The manuscript complies with the current German law.

Consent for publication

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CRediT authorship contribution statement

All authors have approved the manuscript in its current version for submission. **BH** and **NM** gathered and interpreted all available data, wrote the original draft and edited the manuscript. **SRT** substantively revised the manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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