

CASE REPORT**PATHOLOGY/BIOLOGY**

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Accidental Ligature Strangulation by an Ironing Machine: An Unusual Case*

ABSTRACT: In this paper, we present a case of a 53-year-old woman who had her headscarf catch on the cylinder ironing machine in the laundry of the hospital where she worked. The hospital workers found the woman dead with her head stuck to the ironing machine. After the death scene investigation and autopsy were completed, it was determined that the death occurred as a result of accidental ligature strangulation. Accidental ligature strangulation in which an article of clothing is caught in such an electrical machine and strangles the wearer is very rare. This case highlights the fact that these kinds of machines can be hazardous to work around and that increased safety measures should be taken to insure worker safety; additionally, the people who use these machines should be educated on the potential hazards.

KEYWORDS: forensic science, asphyxia, strangulation, ligature, accident, death

Strangulation is a type of mechanical asphyxia that causes a constriction of the neck either by a ligature or hands, in which a constricting force other than the weight of the body is directly applied to the ligature (1,2). Strangulation deaths are typically homicidal, and accidental cases are unusual (3). Generally, accidental strangulations can be separated into two groups. The first group includes deaths without a suicidal intent that result from work- or play-related strangulation. The second group includes autoerotic asphyxias (4). In adults, accidental ligature strangulation typically involves an article of clothing becoming tangled in some type of mechanical device, in which the clothing becomes increasingly constricted due to the continued motion of the machine (5).

A case of accidental ligature strangulation resulting from the entrapment of a scarf in an ironing machine is presented.

Case Report

This case presents the cause of death of a 53-year-old woman who had been working in the laundry of a private hospital for 4 years. On the day of the incident, she and her two colleagues started the ironing machine to iron the sheets (Fig. 1). It was a cold winter day. The victim sat on the counter of the ironing machine to heat her back and leaned her back closer to the machine. At that point, her coworkers left the room. When they re-entered the room 15 min later, they found her dead and observed that her scarf was caught in the roller cylinder of the ironing machine (Fig. 2).

On external examination, the head and face appeared to be highly congested and the neck veins were distended. A 2.5 cm

wide and 0.3 cm depth ligature mark on the neck starting at the level of the thyroid and cricoid cartilage and continuing through both sides of the neck was noted (Fig. 3). There was no ligature mark at the back of the neck. On the upper side of the interscapular area a 6 × 6 cm irregularly shaped ecchymosis and abrasions were observed that had been caused by the pressure of the ironing machine's roller cylinder.

On internal examination, petechial hemorrhages and a 5 × 5 cm ecchymosis in the lower part of the occipital region were noted under the scalp (Fig. 4). The brain was found to be edematous and hyperemic. Petechiae were also noted on the surface of the lungs. All of the internal organs were found to be congested. Upon examination of the neck structures, it was observed that the left horn of the hyoid bone and the cricoid cartilage were fractured (Fig. 5). Ecchymosis was observed at the base of the tongue. It was concluded that the cause of death was a result of asphyxia caused by strangulation with the victim's scarf.

Discussion

Accidental strangulation though rare, is occasionally reported and the circumstantial evidence alone can sufficiently indicate the accidental nature of the occurrence (6).

The first written case report of accidental strangulation in an adult was the world-famous dancer Isadora Duncan who died on 14 September 1929. The long scarf, which she was wearing, became caught in the wire wheels of her Bugatti car, stopping the vehicle. Isadora died at the spot and was later found to have sustained a fractured larynx and carotid artery injury (7). Bhullar and Aggarwal (8) and Aggarwal and Agarwal (9) also reported a few cases of accidental ligature strangulation due to entanglement of the chunni (long scarf worn around neck by Indian women) while moving in a vehicle like a rickshaw and motorcycle. Shetty and Shetty (10) reported a case of a young girl who was accidentally strangled when her chunni was caught in a moving electrical grinder at home.

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FIG. 1—The victim and her two colleagues started the ironing machine of the hospital to iron the sheets.



FIG. 2—The victim was found strangulated with her scarf by the roller cylinder of the ironing machine.

The common mechanism by which accidental ligature strangulation occurs is the progressive constriction of the neck by an article of the victim's clothing. In this case, because of the increasing constriction of the neck with the victim's scarf by the roller cylinder of the ironing machine, the left horn of the hyoid bone and the cricoid cartilage were fractured. The cause of death was asphyxia; however, accidental strangulation deaths can also result from a compression of the neck leading to carotid sinus or vagal stimulation (11).



FIG. 3—A 2.5 cm wide and 0.3 cm depth ligature mark on the neck starting at the level of the thyroid and cricoid cartilage and continuing through both sides of the neck.

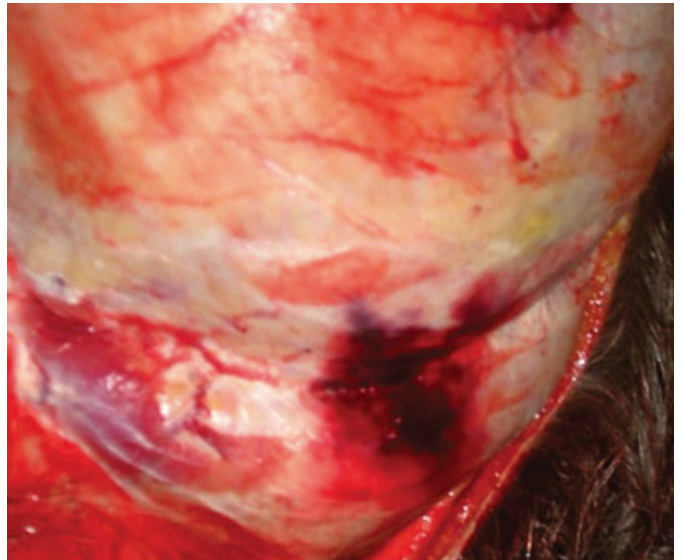


FIG. 4—Ecchymosis under the scalp.

Although accidental ligature strangulations have been described involving various types of machinery, including motor vehicles, industrial machinery, and even household objects, such as drapery cords (12), to the best of our knowledge, this is the first reported case of a ligature strangulation resulting from the use of an ironing machine. This unusual case highlights the importance of proper handling, including the use of all safety precautions, for any form of a mechanical device, even when using seemingly innocuous equipment.

During the death scene examination, it was noted that there were no posted warning signs or protection system in place for the moving parts. The Occupational Health and Safety Expert in the investigation team warned the administration of the hospital about the precautions to prevent this type of accident and the education of the personnel of the laundry. It is obvious that this type of an accident was unforeseen; however, the event was facilitated by the victim sitting on the counter of the ironing machine near the moving parts. Perhaps this incidence could have been avoided if the



FIG. 5—Fracture of hyoid bone.

ironing machine would have been equipped with an automatic shut-off system. In conclusion, this accidental death highlights that these kinds of machines need to be produced with increased safety mechanisms and the people who use them should be educated on the hazards of working with machinery that has exposed moving parts.

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