

CASE REPORT

Amy R. McMaster,¹ M.D.; Emily Wofford Ward,² M.D.; Andrew Dykeman,³ B.A.; and Michael D. Warman³

Suicidal Ligature Strangulation: Case Report and Review of the Literature*

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ABSTRACT: An unusual case of suicidal ligature strangulation is described. The victim is a 42-year-old white male who devised a very elaborate ligature mechanism comprised of thin wire, a plastic tub filled with water, and a combination of other common objects to commit suicide while in custody. A brief review of the literature follows.

KEY WORDS: forensic science, asphyxia, ligature strangulation, suicide

Suicidal ligature strangulation is rare, and published case reports are sparse. The following report describes another such case involving a very elaborate ligature mechanism comprised of wire, a plastic tub filled with water, and combination of common objects used by a prisoner to commit suicide while in custody. A brief review of the literature follows.

Case Report

The decedent was a 42-year-old white male in federal custody awaiting trial on bank robbery charges. During a routine cell check the prisoner was noted to be on the bottom bunk of a metal bunk bed, positioned supine, and appeared to be sleeping (Fig. 1). The guard noticed a large amount of water on the cell floor near the doorway. Investigation revealed that the water was coming from a black plastic rectangular tub (18.5 in. × 14 in. × 7 in.) that was partially filled with water and located beneath the head of the metal bunk. One end of the tub was hanging from the underside of the bottom bunk where the head of the prisoner lay. Closer examination showed that the prisoner was dead with a thin gauge wire wrapped around his neck, and the wire extended through round holes in the metal bunk and suspended one end of

the partially water-filled plastic tub. The 55 in. thin gauge wire ligature was fastened through one of the handles of the plastic tub with a small piece of black hard plastic (1/4 in. greatest dimension). The other end of the wire appeared to be broken and was no longer attached to the tub. In addition, a makeshift water reservoir was found suspended from the underside of the upper bunk and consisted of two large plastic trash bags inside of a white cotton mesh laundry bag (Fig. 2). These bags were empty at the time of discovery. A spout was found in the inner plastic trash bag that consisted of the following: (1) an outermost piece that was an empty toothpaste tube with the seal at the wide end of the tube opened, (2) a toothpaste tube cap with the end of the cap hollowed out, (3) the plastic barrel of a ball point pen, (4) the ball point pen cap with the end of the cap removed, and (5) a piece of coated paper wrapped around the spout to protect against leakage. The pen cap was placed on the empty plastic pen barrel, inserted through the hollowed out toothpaste tube cap, which was then screwed onto the opened toothpaste tube that was inside the plastic trash bag (Fig. 3). The assembled spout was then placed through one of the round holes in the head end of the metal bunk to deliver water into the tub beneath, thus creating progressive tension on the attached wire ligature and progressive strangulation (Fig. 4).

Examination at autopsy showed an asthenic white male in full rigor with nonfixed posterior lividity. There was marked facial congestion and numerous petechial hemorrhages in the skin of the face and neck only above the ligature line. Petechial hemorrhages were also prominent in the conjunctivae and oral mucosa. There was a 1/8 in. wide circumferential horizontal furrow on the neck located 2.2 in. below the angle of the mandible (Fig. 5). There were no cervical soft tissue hemorrhages, epiglottic petechiae, or laryngeal fractures. Internal examination showed no significant anatomic abnormalities.

Examination of the water source revealed a 19.3 L capacity of the inner white trash bag and a flow rate of 39 s per 0.5 L of water through the spout. Given these values and assuming the inner plastic bag was full of water, it would have taken approximately 25 min to drain all of the water from the makeshift bladder into the suspended plastic tub. The filled weight of the plastic tub was 20.2 kg (44.6 lb), and we postulate that when the weight of the water became great enough it broke the connection of the thin wire to the plastic tub, thus dropping the tub on the floor, spilling water, and alerting the attention of the jail staff.

¹ Department of Pathology, Vanderbilt University Medical Center, 4605 TVC, Nashville, TN.

² 223 Highland Village, Jackson, MS.

³ Office of the Medical Examiner, Metropolitan Nashville and Davidson County, 84 Hermitage Avenue, Nashville, TN.

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FIG. 1—Scene as viewed from outside of cell door.



FIG. 2—Position of decedent on bunk with makeshift water reservoir (white bag suspended above bunk) and plastic tub beneath bunk.

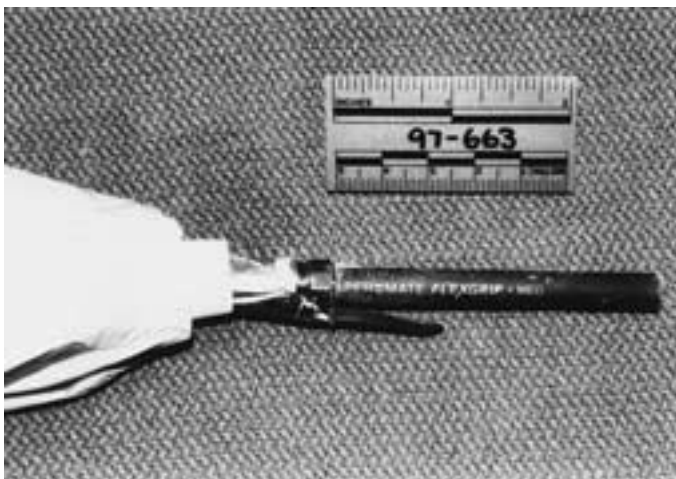


FIG. 3—Assembled spout apparatus: empty toothpaste tube with end of cap hollowed out, plastic ball point pen barrel with end of cap removed, and piece of wax coated paper to help prevent water leakage.

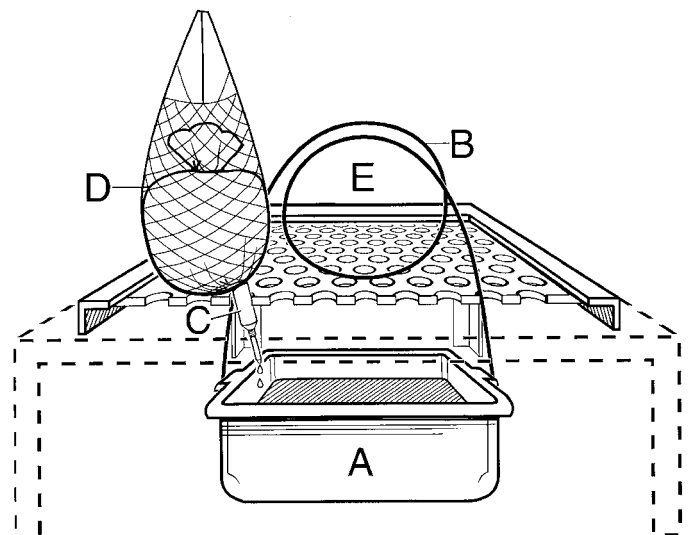


FIG. 4—Schematic representation of assembled suicide apparatus and metal bunk: A: plastic tub to receive water from reservoir, B: thin gauge wire, C: makeshift spout, D: water reservoir made of plastic trash bags inside of mesh bag suspended from upper bunk, and E: position of decedent's neck.



FIG. 5—Posterior aspect of decedent's neck with circumferential furrow.

While several of the components of the ligature mechanism would be commonplace in a jail cell (ballpoint pen, toothpaste, rectangular plastic tub used to store clothing), the source of the plastic and white cotton mesh bags was never found. In addition, investigators were never able to elicit the origin of the thin gauge wire or how the decedent acquired it.

Discussion

As illustrated by this case and by review of the other reported cases, suicidal ligature strangulation is rare and persons committing suicide by this method often prove to be very resourceful in finding or devising the lethal ligature. Reported ligatures and their implementation are greatly varied as exhibited by the following cases. Rupp (1) reports a case of a 55-year-old-white female with a history of alcoholism who used two bow ties as a ligature. The deceased looped two bow ties, bows in back, each with the straps crossed in front of the neck and tied in back, thus producing the

lethal constriction. A 53-year-old-white male, reported by Frazier and Rosenberg (2), wrapped successive loops of coarse twine around his neck. The twine was then knotted, and the decedent pulled the twine taught while bending forward to produce the lethal constrictive force. Kogan and Bloom (3) describe the use of an elastic band tied anteriorly and posteriorly around the neck by a 34-year-old Hispanic male with a long psychiatric history. A similar case involving an elastic band is reported by Bethenod (4). Adelson and Spitz (5,6) independently reported two cases using a "windlass" arrangement with a wood mallet and table knife, respectively, to tighten a ligature around a fixed point. Other examples of lethal suicidal ligatures include a wool scarf and a telephone cord (6). To our best knowledge this is the first reported case of suicidal ligature strangulation while in custody.

Conclusion

In summary this case is rare not only because of the method of suicide used, but because of the remarkable complexity of the ligature device and the victim's ability to procure, assemble, and successfully use the lethal ligature while in custody.

References

1. Rupp JC. Suicidal garrotting and manual self-strangulation. *J Forensic Sci* 1970 Jan;15:71-7.
2. Frazier M, Rosenberg S. A case of suicidal ligature strangulation. *Am J Forensic Med Pathol* 1983 Dec;4(4):351-4.
3. Kogan Y, Bloom T. Suicidal ligature strangulation with an elastic band. *Am J Forensic Med Pathol* 1990;11(4):329-30.
4. Bethenod M, Marin A. Strangulation suicide par lien elastique. *Ann Med Leg* 1960;40:540-2.
5. Adelson L. *The pathology of homicide*. 1st ed., Springfield: Charles C. Thomas, 1974.
6. Spitz WU, editor. *Spitz and Fisher's medicolegal investigation of death*. 3rd ed., Springfield: Charles C. Thomas, 1993.

Additional information and reprint requests:

Amy R. McMaster, M.D.
 Department of Pathology
 Vanderbilt University Medical Center
 4605 TVC
 Nashville, TN 37232