

*Full Length Research Paper*

## Accidental hanging: A report of four cases and review of the literature

M. Ben Dhiab\*, M. Jdidi, Y. Nouma, N. Ben Mansour, M. Belhadj and M. K. Souguir

Department of Forensic Medicine, UHC Farhat HACHED, University of Sousse, Sousse, Tunisia.

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**Accidental hangings have far common characteristics that cause death in unsuspecting victim's. It is a rare medico-legal aspect of death, raising difficulties of differential diagnosis with the suicide hanging and even with other causes of death. This study presents four observations of accidental hanging which occurred to three children and an adult, in strange circumstances sometimes. The medico-legal diagnosis was only possible with the autopsy and the study of the circumstances and the scene of death.**

**Key words:** Hanging, accidental asphyxia, death.

### INTRODUCTION

Death by mechanical asphyxia represents 18.2% of the necropsic activity of the Department of Legal Medicine of Sousse (Tunisia), with an average of 56 deaths per year (Zemni et al., 2000). The hanging represents the first cause of the mechanical asphyxia as well as the first method of suicide in our country.

Accidental hangings are rare, which leads to the difficulty of distinguishing between the diagnosis of suicidal hanging and other causes of death including the intervention of other individuals. This study presents four observations of accidental hangings that occurred in strange circumstances. This study analyses the elements of their medico-legal diagnosis.

### CASE REPORTS

#### Case 1

An eight-year-old boy was discovered suspended by his woollen pullover hung to a trunk of an olive tree. Passers-by freed the body in the hope of rescuing him.

External examination showed a ligature mark of 1.5 cm wide, incomplete, little deep but more developed to the level of its edges (Figure 1). No other traumatic lesion was observed, mainly defensive wounds. Dark post-mortem hypostasis was noted on the lower areas of the arm and leg of the victim.

The autopsy showed an asphyxial syndrome without any bruising to the strap muscles or other soft tissue. There were no fractures to the larynx and hyoid bone. Toxicological analysis was negative and pathologic examination revealed diffuse congestion of all organs, because of asphyxia.

The police's investigation concluded that it was an accident: the child slipped while playing on the tree and the back of his woollen pullover stuck to the trunk.

#### Case 2

A four-year-old boy with mental trouble was discovered suspended to a curtain, the neck caught in a hole and the feet touching the soil. The body was freed by the mother.

\*Corresponding author. E-mail: mbdhiab@yahoo.fr. Tel: 00216 98 603 810. Fax: 00216 73 226 702.



**Figure 1.** Hanging mark in case 1.



**Figure 2.** A front view of hanging mark in the case 3

External examination showed a 0.3 cm wide ligature mark, incomplete, oblique and more pronounced above the thyroid cartilage. Dark postmortem hypostasis was noted on the lower areas of the arm and leg of the victim. No other traumatic lesions were recovered, except defensive wounds.

The autopsy showed an asphyxial syndrome. No intramuscular hemorrhages or other cervical injuries were observed, except fractures to the laryngeal cartilage and hyoid bone. Toxicological analysis was negative. Pathologic examination revealed diffuse congestion of all organs, because of asphyxia.

According to parents, the hole in the curtain was of small diameter and it was their child who had enlarged it while playing. The police's investigation concluded that the hanging was an accident.

### Case 3

A nine-year-old girl was discovered suspended on a rope that was used previously on religious celebration occasion (Aid El Kebir), in carving the sheep. The rope was fixed to a plank, and was situated 170 cm away from the soil. A chair was discovered close to the corpse. Parents had freed the body in the hope to save her.

External examination showed that the deceased was 130 cm tall and presented an incomplete ligature mark of 0.5 to 0.7 cm wide, marked in front of the thyroid cartilage with a marked graze underneath due to slippage of the rope (Figures 2 and 3). No other traumatic lesion was noted, except defensive wounds. Postmortem hypostasis was not installed.

The autopsy showed an asphyxial syndrome associated with small intramuscular hemorrhages observed on the right anterior part of the sterno-cleido-mastoid muscle. No other cervical injuries were observed, except of the laryngeal cartilage and the hyoid bone. The toxicological analysis was negative.

The police's investigation did not discover any element in favour of the suicide. The girl was playing and wanted to imitate the suspension of the slaughtered sheep.

### Case 4

An eighty two-year-old woman has been discovered, in the evening, suspended by a thin cord to the lock of the closed door of her house (Figure 4). The cord made two non tight circles around the neck and presented on the right side of the body, a key that was in the lock and partially turned (Figure 5).

The lock was situated 118 cm away from the soil. The body was leaned toward the front, the left knee put on a door step of 40 cm of height and 11 cm wide, oblique and with a slippery surface. The body was 150 cm height, thin with a diminished constitution and presented a moderate scoliosis.

External examination showed a ligature mark of 0.5 to 0.8 cm wide, incomplete, oblique and prominent in the anterior and on the left side of the neck. It presented an anterior widening corresponding to the knot (Figure 6). No other traumatic lesion was noted mainly on the head, on the back and on hands. Postmortem hypostasis was not installed.

The autopsy permitted to discover an isolated haematoma of the sternal insertion of the left sterno-thyroid muscle, without a fracture to the larynx and hyoid bone. No other internal traumatic or pathological finding was discovered notably on the head and the back. The toxicological analysis was negative. Histological examination revealed diffuse congestion of all organs, because of asphyxia and confirmed the vitality of the muscle haematoma. The same examination had found no acute disease of the heart or brain.

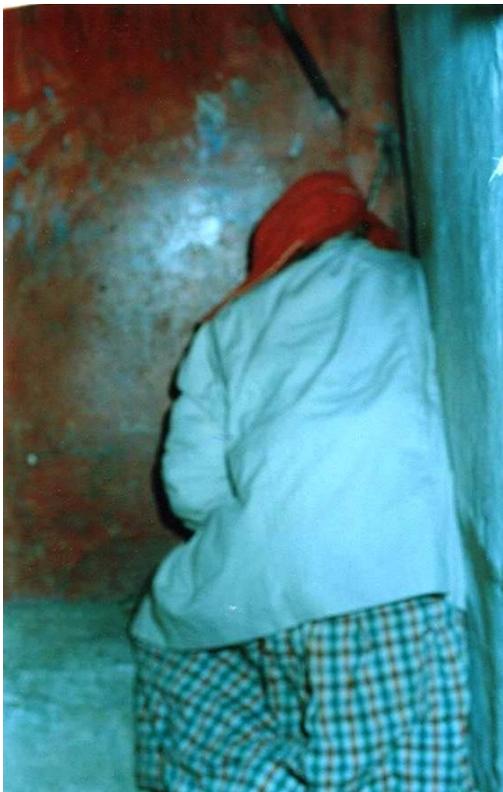
The investigation revealed that the deceased, lived



**Figure 3.** A view from the side of hanging mark in the case 3



**Figure 5.** Hanging support in the case 4



**Figure 4.** Body position in case 4



**Figure 6.** Hanging mark in case 4.

alone and used to hang the key of her house on her neck. She would have slipped on the door step while opening the door. According to the medico-legal point of view, unconsciousness or panic after the slip would explain the victim's inability to straighten herself up.

## DISCUSSION

Accidental hangings are rare and only represent 2% of the 250 cases of hanging autopsied at the department of Legal Medicine of Sousse (Tunisia) for 15 years (Zemni et al., 2000). According to the Davison (1989), it would represent about 5% of the hangings.

Schematically, the survey of these hangings is made according to the age of the victim and the circumstances leading to their death.

### Among children

The first three cases concerned children. The accidental aspect was admitted after a survey of the circumstances and elimination by the autopsy, of the intervention of other individuals.

No initial survey of the death scene was conducted by the police or the forensic pathologist due to the intervention of the family in freeing the bodies in the hope to save them. All three hangings occurred while children were playing.

In the first case, the bond was the child's garment (collar of the pullover). In the literature review, similar cases were found as the hanging to a swing by necklace (Chin and Berns, 1995) or a jacket (Clark et al., 1993). Senard et al. (1992) published two cases of hanging to toboggan with a scarf and a hood.

In the 2nd and 3rd cases, the objects of the games with which the child had fun were at the origin of the accident. Whereas the accidental aspect was easily established for the hanging of the four-year-old boy in the hole of curtain, it was not the case for the 3rd observation. In fact, the hypothesis of the suicide is possible at 9 years, especially as the child used a chair to reach the rope.

The autopsy in this observation did not bring any elements in favour of the accident but confirmed the absence of defensive wounds and other traumatic lesion or intoxication. Only the police investigation had established the diagnosis since the family revealed that their child was normal and had just wanted to imitate the suspension of the slaughtered sheep during a religious feast.

In the literature, accidental hanging is occasionally seen in infants (Vanezis, 1989). The observations are rare where the child, unconscious of the danger, hangs himself deliberately to play. Levin et al. (1976) published a similar case of a six-year-old boy who hung himself while playing to imitate a hanging that he had seen in a movie "hang 'em high".

The child's accidental hanging is more frequent among small children who, in general, trap their heads involuntarily in elements of their environment. It can be the constituent structure of the bed or the pram (Cooke et al., 1995), a cord attaching a dummy to the baby's neck and which is caught-by an element of the bed (Di Maio, 1973), a manipulated electric window of a car (Bayard and James, 2001), etc.

### Among adults

The circumstances of occurrence of the accidental hanging in the 4th observation were strange. Their examination of scene of death and the autopsy findings lead to the diagnosis of the accident.

In fact, the absence of other traumatic lesion notably defensive wounds or trauma on the head and the back, the victim's physical weakness, her advanced age and

the survey of the scene of the death, made that the likeliest hypothesis that was a slip of the left foot on the step, when the victim bent forward to reach the lock of the door. Panic and probably a light cerebral concussion would have been associated and could explain the victim's inability to straighten herself up.

The adult's accidental hanging can be really involuntary. The most frequent cases reported were in relation with professional or leisure activities (parachuting, mountaineering). Hangings by the seat belt (Ross and Roger, 2001) or the electric window of the cars (Pelizza, 1995) have also been reported.

Other circumstances have been described as accidental hanging due to compressing of the neck between the side bars of a bed in elderly subjects affected by neuropsychiatric pathologies (Osculati and Fassina, 2000).

The adult's accidental hanging can be voluntary, such as in autoerotic activities, but the victim did not expect the death. Frequently, pornographic material and other aids to masturbation are found nearby. The usual method of sexual gratification in these cases is by the application of pressure on the neck by some form of ligature so as to produce partial asphyxia which can be controlled at will by the subject (Vanezis, 1989). Several cases have been reported but no one occurred in our country.

### Conclusion

From the survey of these four accidental hanging some remarks emerge:

- (1) Sometimes the bond of the hanging cannot be a rope (garment, curtain), but it is about hanging since the constriction of the neck is produced by the weight of the body;
- (2) The hanging supports were various: curtain, trunk of tree, plank, and lock of door;
- (3) The hanging degree varied: incomplete hanging for the 2nd and the 4th case, complete for the two other cases;
- (4) The accidental hanging can only be established by comparing the autopsy results with the survey of the circumstances and the examination of the scene of death.

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