

Periligature Injuries in Hanging - A Taciturn Proof

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Abstract

Hanging is a common suicidal option and careful observation and documentation of ligature mark is an important aspect during medicolegal postmortem. Apart from ligature mark found in hanging some other injuries such as rope burn, bruise, nailmarks etc. seen around ligature mark known as 'periligature injuries'. A prospective study of 80 cases was done in regard to these periligature injuries and its importance highlighted.

Key words: Hanging, Periligature injury, rope burn, abrasion, ecchymosis

Introduction

Hanging is a form of asphyxia in which there is constriction of the neck as a result of suspension in such a manner that the weight of the body or a part of the body, of the victim pulls upon the ligature.

Practical importance of hanging being distinguished from strangulation is because hanging raises a presumption of suicide whereas strangulation is usually homicidal.

In India hanging is among one of the preferred method for committing suicide. It is therefore necessary to give special attention to the details of scene if an accurate interpretation is to be made. The place, the posture of the body and the manner in which it is clothed should be noticed. Several details concerning ligature marks also require attention.

Associated injuries around the ligature marks i.e. periligature injuries such as rope burn/blisters, ecchymosis/bruise, abrasion/nail marks can be seen. However these injuries need special attention with reference to nature, location, distribution and pattern.

Isolated case reports dealing with periligature injuries have been published but still no study has been conducted with this view in mind. The present study was undertaken to ascertain various types of periligature injuries and to study them in relation to the ligature material and ligature mark observed and to add substance to ligature marks antemortem nature.

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Material and methods

A prospective study of asphyxia death due to hanging subjected to medicolegal autopsy by the Department of Forensic Medicine , Government Medical College, Nagpur between Jan 2009 to December 2009 was carried out with a view to assess the information that a ligature mark can provide in such deaths. A total of 80 medicolegal autopsies concerned with death due to hanging were observed. Age group ranged from 1.5 years to 65 years.

History regarding the incident, age, sex, absence and presence of material used for ligature and ligature mark were obtained while performing medicolegal postmortem. Only cases where the medicolegal postmortem was conducted within 24 hours of death of that individual were selected and cases having decomposition changes were excluded. Periligature injuries were classified as rope burn/blisters, abrasions and ecchymosis/bruises.

Results

Out of the 80 cases studied 54 were males and 26 were females. Different types of ligature material used were Nylon rope, Odni, Dupatta, cotton rope, saree, electric wire, newar patti, plastic and rubber pipe. Of the different types of ligature material used, commonest was nylon rope 26 cases (32.5%).

In present study in 14 cases (17.5%) periligature injuries in the form of abrasions, ecchymosis and rope burns were seen (Fig 1-3). Out of this 14 cases of periligature injuries 4 cases (28.5%) were of rope burn/blisters, 3 cases(21.42%) of abrasions, 2 cases(14.28%) of bruises while in 5 cases (35.72%) both abrasions and bruises were seen. (Table No 1)



Fig 1. Showing ecchymosis surrounding ligature mark



Fig 2. Showing rope burn/blister surrounding ligature mark



Fig 3. Showing abrasion above ligature mark due to neckfold abraded by ligature

Table 1. Different types of periligature injuries

Periligature injury	No of cases and percentage
Rope burn	04 (28.58%)
Ecchymosis/Bruise	02(14.28%)
Abrasion	03 (21.42%)
Both abrasion and Ecchymosis/bruise	05 (35.72%)
Total	14 (100%)

Of the total cases in which periligature injuries were seen maximum number of periligature injuries were observed in ligature material made of nylon rope 9 cases (64.28%) followed by odni 3 cases (21.4%), cotton rope 1 case (7.14%), Dupatta 1 cases (7.14%) while no periligature injuries were seen in cases of sari, electric wire, plastic rubber pipe and newar patti used as ligature material. (Table No 2)

Table 2. Types of ligature material causing periligature injuries

Ligature material	No of cases causing periligature injuries
Nylon rope	09 (64.28%)
Odni	03 (21.4%)
Cotton rope	01 (7.14%)
Dupatta	01 (7.14%)
Total	14 (100%)

Ligature material made of nylon rope caused rope burns/blisters in 4 cases (28.5%), abrasion in 01 case (7.14%), bruise in 01 case (7.14%) and both abrasion and bruise in 03 cases (21.42%). Odni caused abrasion in 01 case (7.14%) while 2 cases (14.28%) showed both abrasion and bruise. Cotton rope caused bruise in 1 case (7.14%). Dupatta caused abrasion in 1 case (7.14%). (Table No 3)

Table 3. Ligature material in relation with individual periligature injuries

Ligature material	Rope burn	Ecchymosis/ Bruise	Abrasion	Both abrasion and Ecchymosis /bruise	Total (n=14)
Nylon rope	04 (28.5%)	01(7.14%)	01(7.14%)	03 (21.42%)	09
Odni	00 (00%)	00 (00%)	01(7.14%)	02 (14.28%)	03
Cotton rope	00 (00%)	01(7.14%)	00 (00%)	00 (00%)	01
Dupatta	00 (00%)	00 (00%)	01 (7.14%)	00 (00%)	01

Discussion

Ligature mark is crucial evidence in asphyxial deaths¹⁻⁸. The track and course of ligature mark helps in determining the type of asphyxial death, hanging or strangulation. In cases of hanging apart from giving an opinion as to the cause of death the forensic medicine person has to comment on the nature of hanging being antemortem or postmortem? A saliva dribble mark is classical feature of antemortem hanging but it may not be present always in all cases due to wiping of mouth in efforts of resuscitation done by relatives or doctors. So some other features like periligature injuries can aid a medicolegal person to comment upon the antemortem nature of hanging.

Periligature rope burns/blister

Mohanty et al¹ opined that findings such as rope burns seen around the ligature mark can be termed as periligature injuries. Rope burns are produced by tough ligature material like coir or nylon rope due to friction of rope against skin that generates considerable heat which will produce blisters by expressing tissue fluid into the upper layers of skin.

Spitz² has noted that blisters containing serum may result from friction of a tight noose against skin.

Wankhede A G³ observed that vesiculation are usually found at the margin of ligature mark which are due friction of ligature material with the skin.

In the present study rough ligature material like nylon rope caused periligature injuries in form of rope burn/blisters surrounding ligature mark. Their presence is suggestive of antemortem nature of hanging.

Periligature abrasions

Spitz² has noted that in addition to the ligature mark bizarre abrasions are occasionally seen on the neck of a hanging victim. Constriction of the neck by the noose sometimes causes pinching of the skin and vertical folds which rubs against the noose and become abraded. When a noose is wound around the neck more than once the skin between the loops may be pinched horizontally causing a thin sometimes textured reddish brown line of dried skin.

Wankhede A G³ noted that in hanging when the loop gets pulled upwards due to weight of body below the neck, sometimes causes abrasions directed upwards towards ligature mark known as the 'evidence of slippage of ligature material' which is considered as a sign of antemortem hanging.

Camps⁴ noted that in cases of hanging where there is much movement between the neck and the rope before death the skin may be abraded. There may be narrow hemorrhagic border to parts of ligature marks.

Polson⁶ found that the victim might pluck at the ligature and if he had long nails he could then abrade skin. The upwards movement of the rope at the time of suspension may scratch the skin.

Reddy⁷ noted that in cases of hanging during suspension there is tendency of the ligature to move upwards which may produce a double impression of ligature the lower mark being usually very superficial and is connected by fine abrasions due to slipping ligature.

The present study showed periligature injuries in form of abrasions surrounding ligature mark by different types of ligature material used. The ligature material producing periligature injuries being rough one like nylon, odni, and dupatta.

Periligature ecchymosis/bruise

Spitz² has noted that in addition to the ligature mark bizarre bruises are occasionally seen on the neck of a hanging victim. Bruise on the neck are due to wedging of fingers under the noose in an attempt to remove the constriction.

Wankhede A G³ noted that partial or complete suspension of the body cause obliquely placed ligature mark irrespective of its position around thyroid cartilage. Different types of lesions can be found around the ligature marks. Multiple ecchymotic areas found above the ligature mark may be postmortem however when they are present below ligature mark they are invariably antemortem in nature.

Mathiharan⁸ observed that ecchymosis/bruises alone have no significance to whether the hanging was caused during life or not but abrasions with hemorrhagic areas are strongly suggestive of it having taken place during life.

In the present study different types of ligature material caused periligature injuries in form of ecchymosis/bruises surrounding ligature mark. The ligature material producing periligature injuries being rough one like nylon, and cotton rope. Also the abrasions or bruises produced surrounding the ligature mark is usually antemortem. This is commonly caused by the attempts of the victim to pull away the ligature. The factors for the production of various abrasions, bruises being the nails of the struggling victim to free himself, fibers projecting from the material and the knot.

To an inexperienced eye this injuries may be easily missed or misinterpreted. Obviously in these cases the interpretation must be made with utmost caution and care. The present study has revealed the importance of identifying such injuries and interpreting it in relation to ligature mark found.

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