

Rope Burn: A Peri-Ligature Injury of Medico-Legal Significance in Hanging Deaths

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Abstract:

In hanging deaths, one of the most significant post-mortem findings is the ligature mark. In some cases, peri-ligature injuries like rope burns, fingernail marks etc may be found adjacent to the ligature mark. An 18-year-old male was brought dead to the hospital with the history of hanging. On external examination, multiple localized blisters filled with clear fluid were found below the ligature mark on the left side. Ligature material was present in situ around the neck, and it was multiple flat plastic goods packing threads. Rope burn is a peri-ligature injury produced when ligature materials, especially those that are rough and tough, slide against the skin. Rope burns are produced only when the tissues are alive and not possible when the person is dead. The presence of rope burns indicates the ante mortem nature of hanging.

Keywords: Rope burns, Peri-ligature injury, Ligature mark, Ante-mortem Hanging

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Introduction

Hanging is one of the most common modes of suicide in many countries. In such deaths, one of the significant post-mortem findings is the ligature mark around the neck. At times, peri-ligature injuries like rope burns, fingernail marks etc may be found adjacent to the ligature mark. Among the various peri-ligature injuries, rope burn has got significant medico-legal implication since such injuries are formed only when the tissues are alive and intact. Careful search and proper interpretation of rope burn help in determination of ante-mortem nature of hanging along with dribbling of saliva and le facie sympathique.

Case History:

An 18-year-old male was brought dead to

the hospital with the history of hanging. As per law of the land, the body was subjected for medico-legal autopsy. Salient autopsy findings were, Ligature mark (pressure abrasion) of length 30 cm, width 0.7 cm to 1 cm, depth 0.3 cm, dark brown in colour, parchmented, with no typical pattern, obliquely running upwards and backwards, non-continuous was present around the neck above the thyroid cartilage. Posteriorly, the ligature mark was ending at the hairline on the left side and middle of the back of the neck on the right side. Multiple localized blisters filled with clear fluid were present below the ligature mark on the left side over an area of size 2 cm x 1.5 cm. (Fig. 1)

Ligature material was present in situ around the neck. Material used was flat plastic goods packing threads (Fig 2.). There were 12 threads, each of width 0.3 cm secured together by multiple knots. Noose was a running type (slip knot) measuring 28 cm. Few hair strands were found entangled in the knot. Length of the ligature material excluding the nose was 73 cm.

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Figure 1. Multiple localized blisters (rope burns)



Figure 2. Ligature material

Discussion:

Rope burn is a peri-ligature injury produced when ligature material slides against the skin. It is common with rough and tough ligature materials like nylon rope or coir rope etc. ^{1,2} The friction between the rope and the skin due to the violent movement of the body in hanging results in the localised generation of the heat leading to split at the epidermis or dermo-epidermal junction. Entry of tissue fluid into the space created by the split results in the blister formation.¹ In a study conducted by

Tumram NK et al., blisters were present in 4 cases (15.3 %) out of 26 in which the ligature material was nylon rope and blisters were not seen in the cases where non-nylon type of ligature materials were used.³

Conclusion

Perpetrators often manipulate the scene to mislead the investigators. One common method is to hang the body of the deceased after the actual cause of death to make it appear as suicide. This requires careful examination to uncover inconsistencies. Rope burns/ blisters are produced only when the tissues are alive and not possible when the person is dead. The presence of rope burns indicates the ante mortem nature of hanging. Hence, rope burns need to be considered while opining a case of hanging as ante-mortem or post-mortem in addition to the classical signs of ante-mortem hanging ie. dribbling of saliva and Le facie Sympathique. The presence of rope burns is a significant indicator that hanging occurred while the person was alive. It emphasizes the importance of consideration of all evidence before concluding the manner of death.

References

1. Spitz WU. Blunt force injury. In: Spitz Werner U, Fisher Russel S (eds.) *Medicolegal Investigation of Death*. 2nd ed. USA: Charles C. Thomas; 1980; 124-58.
2. Mohanty MK, Rastogi P, Pradeep Kumar G, Kumar V, Manipady S. Periligature injuries in hanging. *Journal of Clinical Forensic Medicine*. 2003; 10: 255-8.
3. Tumram NK, Ambade VN, Bardale RV, Dixit PG. Injuries over neck in hanging deaths and its relation with ligature material: Is it vital?. *Journal of Forensic and Legal Medicine*. 2014; 22: 80-3.