

Original Research Paper

Study of Ligature Mark in hanging cases in Bangalore East Region

¹Mallikarjun S Ballur, ²Dayananda R, ³S. K. Karthik, ⁴Priyanka Murgod, ⁵G Sujathan

Abstract

Hanging is the commonest method of committing suicide and is considered as a painless form of death. In hanging the appreciation of external signs particularly ligature mark plays a vital role. Hence a proper observation and study of ligature mark which the characteristic hallmark of hanging, needs greater emphasis. The ligature mark is a pressure abrasion on the neck at the site of the ligature which appears as a groove. This prospective study was conducted among victims of hanging brought to Dr. B. R. Ambedkar Medical College morgue, Bangalore during the period November 2010 to October 2012. A sum total of 232 cases brought with a history of hanging were selected for this prospective study. Atypical ligature marks with partial hanging outnumbered typical ligature mark with complete hanging. Single ligature mark above the level of thyroid cartilage with a breadth of 1to2cms is observed in the maximum number of cases. Majority of the ligature marks were prominent in their appearance. The colour of ligature mark was dark brown in one third of cases.

Key Words: Hanging; Ligature mark; Suicide; Thyroid cartilage

Introduction:

Death is certain for all living beings, but only humans end their lives prematurely by committing suicide. History of suicides goes back at least to the earliest human records.

Human suicidal behaviour has always been a source of dread and wonder to mankind. There are many methods for committing suicide like poisoning, hanging, self-immolation, drowning etc. Hanging is the commonest method of committing suicide in cities and towns and is considered as a painless form of death.

Sometimes, hanging is adopted as a last resort after other forms of suicide (poisoning, cut throat injury, etc.) have failed to produce the desired effect. The thought to hang one-self may come progressively or on an impulse.

Hanging is a form of violent asphyxial death produced by suspension of the body by a ligature around the neck, the constricting force being the weight of the body (complete hanging), or part of the weight of the body (partial hanging). In hanging the appreciation of external signs particularly ligature mark plays a vital role. Hence a proper observation and study of ligature mark which the characteristic hallmark of hanging needs greater emphasis.

The ligature mark is a pressure abrasion on the neck at the site of the ligature which appears as a groove. In typical hanging, the ligature mark is situated above the level of thyroid cartilage between the larynx and the chin. It is directed obliquely upwards along the line of the mandible and reaches the mastoid processes behind the ears.

It is sometimes absent at the back. However variations in the ligature marks like faint/absent ligature mark, ligature mark artefacts as ant bite marks are encountered in day to day autopsies. Sometimes there may be double ligature marks.

It may be due to slippage of the ligature. Character of the ligature mark depends on various factors like the nature of the ligature, body weight, length of time the body has remained suspended and the number of turns of the ligature round the neck. The course of the ligature mark depends on whether a fixed or running noose has been used.

Corresponding Author:

¹Assistant Professor, Dept. of Forensic Medicine, Azeezia Institute of Medical Sciences, Kollam, Kerala- 691537 India

E-mail: drmallikarjunballur@gmail.com

²Assist. Prof, Dept. of Forensic Medicine, Mysore Medical College, Mysore, Karnataka

³Assist. Prof, Dept. of Forensic Medicine, Dr. B. R. Ambedkar Medical College, Bangalore

⁴Post Graduate Student, Dept. of Pathology, S. Nijalingappa Medical College, Bagalkot, Karnataka

⁵Prof & HOD, Dept. of Forensic Medicine, Azeezia Institute of Medical Sciences, Kollam, Kerala

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Materials and Methods:

This prospective study was conducted among victims of hanging brought to Dr. B. R. Ambedkar Medical College morgue, Bangalore during the period November 2010 to October 2012. Of all the cases brought to the department for medico-legal autopsy, cases in which death had resulted from hanging were identified and selected for this study. A sum total of 232 cases were selected for this prospective study.

We exclude the decomposed bodies in which ligature mark was masked from this study. Detailed information regarding the deceased and the circumstances of death was collected from the police and relatives. In some cases, this information was supplemented by either, visit to scene of occurrence or from the photographs of scene of occurrence.

Results and Discussion:

The hanging deaths are taking different types in their execution as typical/atypical and complete/partial. In this study, typical hangings were seen in 51 cases and atypical hangings in 181 cases. (Table 1) The position of the knot or any intervening object like Clothings, bony projections (angle of the jaw), long plaits in Indian women and also the beard accounted for the majority of the mark being atypical. Similar findings were observed in the studies conducted by other authors'. [1, 2]

In the present study complete hanging was seen in 74 deaths. Partial hanging was taking lives mostly, accounted for 158 deaths. Among these feet touching the ground was seen in 107 deaths, kneeling in 27, sitting and lying down prone in 12 each. The partial type of hanging which was common in our study was also seen in other studies. [1-3] but, in studies conducted by M Ahmad [4] and T. Saisudheer [5] complete hanging outnumbered partial hanging cases.

In our study, it was observed that in 192 cases, the level of ligature mark was above the thyroid cartilage, below the thyroid cartilage in 13 cases and overriding the thyroid cartilage in 27 cases. (Table 2) This was also observed in various other authors' studies. [1, 5-11] In this study, ligature mark was dark brown in 76(32.76%) cases; yellowish brown in 63(27.15%) cases; red colour in 50(21.56%) cases and pale in 43(18.53%) cases. (Fig. 1)

In present study the breadth of the ligature mark was between 1-2cms in 155 cases. (Fig. 2) Similar findings are reported by others. [7, 8, 12-14] The breadth of ligature mark depends on the width of the ligature material and also the multiplicity of the ligature material. The

ligature mark was prominent in 179 cases and faint in 53 cases. (Table 3) Our findings were consistent with the findings observed in other studies. [15-18]

The prominent mark is due to the type of the material being strong and also increased period of suspension. The colour of ligature mark was dark brown in 76 cases (fig. 2) which is consistent with other author findings. [16, 17] The reason being the colour of ligature mark depends on the duration of suspension and the complexion of the person.

Conclusion:

Atypical ligature marks with partial hanging outnumbered typical ligature mark with complete hanging. From the medico-legal point of view, following measures and recommendations in cases of deaths due to hanging are very essential:

- Photograph of the scene of occurrence should include point of suspension.
- In fatal cases not to disturb the ligature material and release only the suspension point or cut the ligature material away from the site of knot.
- To always bring the material along with the body for correlation with the mark.
- Radiograph of the neck plays a vital role to appreciate the fractures of hyoid bone and thyroid cartilage.
- If necessary, to visit the scene of occurrence.

References:

1. Sharma BR, Harish D, Sharma S, Singh H. Injuries to structures in deaths due to constriction of neck, with special reference to hanging. J Forensic Leg Med. 2008 July; 15(5): 298-305.
2. Sharma BR, Singh VP, Harish D. Neck structure injuries in Hanging-comparing retrospective and prospective studies. Med Sci. Law. 2005; 45(4):321-330.
3. Uzun I, Buyuk Y, Gurpinar K. Suicidal hanging: fatalities in Istanbul retrospective analysis of 761 autopsy cases. J Forensic Leg Med. 2007; 14(7):406-409.
4. M Ahmad, MZ Hossain. Hanging as a Method of Suicide: Retrospective Analysis of Postmortem Cases. JAFMC Bangladesh. 2010; 6(2):37-39.
5. T. Saisudheer, T. V. Nagaraja. A study of ligature mark in cases of hanging deaths. Int. J Pharm Biomed Sci. 2012;3(3):80-84.
6. Momin SG, Mangal HM, Kyada HC, Vijapura MT, Bhuvu SD. Pattern of Ligature Mark in Cases of Compressed Neck in Rajkot Region: A Prospective Study. Journal of Indian Academy of Forensic Medicine. 2012; 34(1):40-43.
7. G. A. Sunil Kumar Sharma, O.P. Murthy, T. D. Dogra. "Study of ligature marks in asphyxial deaths of hanging and strangulation". International Journal of Medical Toxicology and Legal Medicine 2002; 4(2):21-24.
8. Elfawal M.A. and Awad O.A. "Deaths from Hanging in the Eastern province of Saudi Arabia." Medicine Science and Law, 1994; 34(4):307-312.
9. Luke J.L. "Asphyxial Deaths by Hanging in NewYork City, 1964-1965." Journal of Forensic Science 1967; 12(3):359-369.
10. Betz P., Eisenmenger W. "Frequency of throat-skeleton fractures in hanging". The American Journal of Forensic Medicine & Pathology 1996; 17(3): 191-193.

11. **Paparo G.P., Siegel H.** "Neck markings and fractures in suicidal hangings." Forensic Science International 1984; 24:27-35.
12. **Chaudhary B.L, Sharma R.K, Singh D.** Suicidal hanging versus homicidal hanging- A case report. Indian Journal of Forensic Medicine and Toxicology. 2008; 2(2): 32-33.
13. **Ryk James, Paul Silcocks.** "Suicidal Hanging in Cardiff: A 15 Year Retrospective Study." Forensic Science International 1992; 56:167-175.
14. **Sarangi M.P.** "Ligature Mark/s- In Forensic Pathologist's Perspective." Journal of Forensic Medicine and Toxicology 1998; 15(1): 99-102.
15. **M.I. Sheikh, S.S. Agarwal.** Suicide in custody. Journal on rehabilitation of torture victims and prevention of torture. 2004; 14(1): 35-37.
16. **Sharma RK.** Concise text book of Forensic Medicine and Toxicology. 2nd edition: 55-56.
17. **Jani C.B., Gupta B.D.** "An autopsy study of parameters influencing injury to osteocartilaginous structures of neck in hanging". International Journal of Medical Toxicology & Legal Medicine 2002; 5(1): 4-7.
18. **Nikolic Slobodan, Micic Jelena, Atanasijevic Tatjana, Djokic Vesna, Djonic Danijela.** "Analysis of Neck Injuries in Hanging [Case Report]" The American Journal of Forensic Medicine and Pathology 2003; 24(2): 179-182.

Table 1: According to the Type of Hanging

Type of hanging	Cases	Percentage
Complete	74	31.89
Partial	158	68.10
Typical	51	21.98
Atypical	181	78.02
Total	232	100

Table 2: According to the Level of the Ligature Mark

Level of ligature mark	Cases	Percentage
Above the thyroid cartilage	192	82.76
Overriding the thyroid cartilage	27	11.64
Below the thyroid cartilage	13	5.60
Total	232	100

Table 3: According to the Characteristics of Ligature Mark

Characteristic of the ligature mark	Cases	Percentage
Prominent	179	77.16
Faint	53	22.84
Continuous	11	4.74
Interrupted	221	95.26
Total	232	100

Fig. 1: According to the Colour of the Ligature Mark

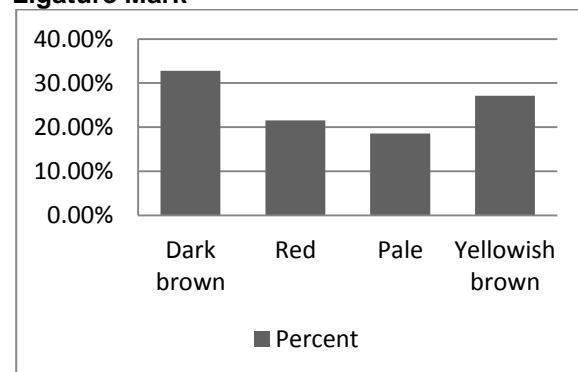


Fig. 2: According to the Breadth of Ligature Mark

