

Feature of Ligature Mark and Fractures in Hanging and Ligature Strangulation Cases in Ajmer Region Population of India

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Abstract

Human race is one of the most intellectual living creatures among the whole living world. Human race has the potential to think and act, but unfortunately humans have also by desire searched the way to end their own by adopting various ways of mechanical asphyxia which is most commonly encountered in medico-legal practice. Hanging is one of the most common method of suicide in India and around the world, other types of hanging are, homicidal hanging judicial hanging, autoerotic hanging. A study was conducted in the Department of Forensic Medicine & Toxicology at JLN Medical College, Ajmer for a period of one year i.e. from January 2009 to December 2010. During this period a total number of 105 cases were observed; of which 100 were of hanging and 05 cases of ligature strangulation. In the investigation 100 hanging cases reported in Ajmer region were studied for injuries to bones and cartilage of neck. In the study, hyoid bone (13 %) and thyroid cartilage fracture (5%) were most commonly observed among male and female respectively, no case of larynx and trachea fracture was recorded.

Keywords: Hanging, ligature feature, neck fracture, hanging, ligature strangulation

Introduction

In humans, major mode of death is asphyxia and of which mechanical asphyxia is most commonly seen in medico-legal practice. Mechanical asphyxia created by constriction round the neck plays a major role in human death, hanging which was originated in Persia (now Iran) about 2500 years ago as a method of execution is very common. Hanging still remains the standard lawful method of execution in many countries, and in India is one of the most common method of suicide. The other types of hanging are, homicidal hanging judicial hanging, autoerotic hanging (Camps et al, 1976)¹. Hanging differs from strangulation in which the neck is constricted irrespective of any effect caused by the weight of the

body (Mant, 1984)⁵. The various structures damaged in hanging and strangulation include the soft tissue like skin, subcutaneous tissue, fascia, muscle, blood vessels and lymph node and the bony and cartilaginous tissues like the hyoid bone and larynx (Mant,1984)². Ligature mark is a vital evidential piece to assess the cause of death, ligature mark depends on the nature and position of the ligature used, and the time of suspension of body after death. Ligature mark is found as pressure mark on the neck underneath the ligature. Initially it appears as a pale groove which on drying becomes yellowish brown parchment like (Mariam 2015)³. In the present study observation were recorded on the feature of ligature marks and fracture caused by hanging and ligature strangulation in cases recorded among the population of Ajmer region of Rajasthan State.

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Material and Method

Present study was done in the Department of Forensic Medicine & Toxicology at JLN Medical College, Ajmer for a period of one year i.e. from January 2009 to December 2010. During this period

a total number of 105 cases were observed for violent asphyxial death, of which 100 cases were of hanging, 05 cases were of ligature strangulation in which 03 cases were of homicidal ligature strangulation and 02 cases were of accidental ligature strangulation. In the present paper observation pertaining to 100 cases of hanging are presented and discussed. In cases of the body, brought with ligature material, the ligature material were studied for feature of ligature marks, fracture of bone or cartridge and its gender based frequency.

Results and Discussion

In the study done of 105 cases 100 cases were of hanging and 05 cases were of ligature strangulation. The distribution pattern of ligature features observed in all the cases showed that three colour texture were observed i.e., reddish brown, parchment and pale (table

1). The cases were classified as per gender, in hanging cases it was seen that in male parchment type feature was maximum (37 cases) followed by reddish brown (21 cases); whereas in females reddish brown feature (16 cases) was seen in maximum events followed by parchment (6 cases). In strangulation cases observed in female both reddish brown and parchment features were in equal frequency (2 cases).

The hyoid bone fracture was observed in 4 cases of male with no case in female; where as for thyroid cartilage fracture female cases were 3 with no male case. None of the case was observed for larynx and trachea fracture (Table 2). The frequency distribution pattern showed that there were 4 % and 3 % case of hyoid bone fracture in hanging cases among male and female respectively.

Table 1: Distribution ligature mark features in hanging and ligature strangulation cases

Features (Color, Textures)	Hanging			Strangulation		
	Male	Female	Total No.	Male	Female	Total No.
Reddish-brown	21	16	37	0	2	2
Parchment	37	6	43	0	2	2
Pale	8	2	10	0	0	0
Total	66	24	90	0	4	4

Table 2: Genderwise distribution of injuries to bones and cartilages of neck in cases of hanging and ligature strangulation

Type of Neck Compression	Hyoid Bone Fracture			Thyroid cartilage Fracture			Larynx and Trachea Fracture		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Hanging	4	-	4	-	3	3	0	0	0
Ligature strangulation	-	-	-	0	3	3	0	0	0

Discussion

Hanging cases has increased with the event of urbanization, study on the aspects like cause of death, ligature marks and fracture to neck region is imperative to understand the subject. Therefore, the present study conducted in the Department of Forensic Medicine & Toxicology at JLN Medical College, Ajmer on 105 cases recorded of hanging and ligature strangulation in

Ajmer district from January 2009 to December 2010 are discussed below.

The observation made on ligature marks showed that parchment type mark was most common in male as compared to female, 37 cases were recorded on male category as compared to 6 cases in female. Whereas for

reddish brown mark was high in male (21 cases) but was very common in female (16 cases). Presence of ligature mark is common in mechanical asphyxia, previous reports by Pal et al (2016)⁴ and Mariam (2015)³ suggest that these observation are important to understand the case and generate valuable information as a forensic expert.

The frequency of cartilaginous and bony anatomy of neck *viz* hyoid bone/ thyroid cartilage and LTA (Larynx & Trachea fracture) was not high but the damage indicated that in cases of hanging the damaged to the cartilage and bony structure of the neck are very less. In cases of hanging the hyoid bone gets fractured more commonly than the thyroid cartilage. In cases of ligature strangulation the fracture of thyroid cartilage was also found, but due to very less number of cases of ligature strangulation in the study no certainty of the findings can be derived.

Conclusion

In India suicidal hangings are common, very often homicidal hangings are simulated as suicidal hangings. In our study on Ajmer population, 105 asphyxial death were recorded for the study period. Out of 105, 100 cases were of hanging and 05 of ligature strangulation of which 03 of homicidal ligature strangulation and 02 accidental ligature strangulation. In the study, parchment type feature was maximum (37 cases) followed by reddish brown (21 cases) in males whereas reddish brown features were maximum in female. Hyoid bone (13 %) and thyroid cartilage fracture (5%) were most commonly

observed among male and female respectively, no case of larynx and trachea fracture was recorded.

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Ethical Clearance: This is my bonafied research work for award of MD Forensic Medicine Degree by Rajasthan University of Health Sciences, Jaipur in May 2011. My thesis has been evaluated and approved by panel of examiners

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