Indian Internet Journal of Forensic Medicine & Toxicology
Vol. 15, No. 3 July-September 2017, 55-58
DOI :

Case Report

Split Lacerations of Cervical Fascia As peri-Ligature Injury in Hanging: A Case Report

Parthapratim Mukhopadhyay[1]*, Koushik Roy[2]

[1]Professor and Head, [2]Postgraduate Trainee (Junior Resident), Department of Forensic and State Medicine, Burdwan Medical College, Burdwan, Purba Bardhaman-713104, West Bengal, India
*Corresponding author email id: drpartha99md@gmail.com

ABSTRACT

This is a case report of a suicidal hanging with the rare finding of a split laceration as a peri-ligature injury. The plausible mechanism of the injury is the compressive force acting almost vertically on the neck structures, splitting the tissue that is supported by the underlying thyro-hyoid complex.

Keywords: Forensic pathology, Hanging, Ligature, Split-laceration, Peri-ligature injury, Suicide, Autopsy

INTRODUCTION

The ligature mark is an important finding in the cases of fatal compression of the neck structures. The mark and associated injuries often depend on the texture of material and magnitude the constrictive force. Apart from the primary ligature mark, other injuries are found in its vicinity in the neck region in hanging. These injuries or marks are collectively termed peri-ligature injuries. Earlier studies have reported that the common peri-ligature injuries are in the form of abrasion, scratches, blisters, superficial blisters and petechial haemorrhages around the ligature mark. In the present study, we report a rare finding of split laceration of cervical fascia as a peri-ligature injury in hanging with a nylon rope in an adult subject.

CASE REPORT

A 56-year-old male was declared brought dead at the emergency of a tertiary level medical college hospital. The history from police inquest revealed that the deceased was found hanging in his room from the ceiling fan with the door locked from inside. The deceased was brought to the morgue at around 1:10 pm, and the post-mortem was done at 2:30 pm on the same day. Ligature material found in situ was a nylon rope, 0.5 cm in diameter.

EXTERNAL APPEARANCES

Average built, moderately nourished body with complexion rather dark. Face appeared darkened and eyeball softened. Sero-sanguinous discharge was noted from the nostrils. Pupils were dilated and fixed. Conjunctiva was congested. Rigor mortis had passed off with post-mortem blisters clustered at places. The body showed signs of early decomposition.

EXTERNAL INJURY

- One ligature mark over the neck placed above the *level of thyroid cartilage* running obliquely upwards, non-continuous, being interrupted by the impression (position) of knot on left side just below the angle of mandible. The ligature mark was a dark brown groove with based dried, hardened and parchmentised (Figure 1). It measured 15″ as traced with average width of ¼″. The mark appeared most prominent on the right side. The mark could be traced as following:

1. ½″ below (left) angle of mandible.
2. ½″ below chin at mid-line.
3. 2½″ below (right) angle of mandible.

Figure 1: The ligature mark was a dark brown groove with based dried, hardened and parchmentised

Then, it was found running backwards along the nape of neck to end on the left side with a gap of ¼″ just below angle of mandible.

On dissection, the subcutaneous tissue beneath the mark appeared whitened and glistening.

- One lacerated wound (½″ × ¼″× deep cervical fascia deep) over the front of neck, 3″ below chin just left of mid line. The lacerated wound had a very narrow zone of marginal abrasion (Figure 2).

Figure 2: The lacerated wound had a very narrow zone of marginal abrasion

- Bruise (2″ × 1″) on right parietal region 2″ right of midline.

INTERNAL FINDINGS

No injury to soft tissue of muscles of neck was found (Figure 3). Hyoid and thyroid was intact. Pleura were found congested on both sides. Scattered pin point sub-pleural haemorrhages were observed with maximum distribution in the inter-lobar fissure and base. Lungs were diffusely congested and oedematous. Liver, Spleen, stomach mucosa and both the kidneys were congested.

Figure 3: No injury to soft tissue of muscles of neck was found

DISCUSSION

Suicidal hanging is a common form of asphyxial death encountered in routine forensic practice[1–5]. The ligature mark in hanging is essentially a pressure abrasion. It is invariably found in the cases where there is adequate compression of the neck structures. The resultant constricting force is transmitted through the ligature when the body is suspended from a point. The weight of the body provides the indirectly acting force that constricts the neck structures. This resultant force has two components – one circumferential constricting force, whereas the other acting along the vertical axis and stretching the neck. These forces produce the characteristic mark of injury in the neck region. Several investigations have reported the epidemiology and classical autopsy findings in hanging[6–7].

Peri-ligature injuries have also been reported in hanging in earlier studies[8,9]. Another work on 129 cases of hanging reported 14% peri-ligature injuries[10]. The common peri-ligature injuries reported earlier were in the form of abrasion, scratches, blisters, superficial blisters and petechial haemorrhages around the ligature mark. Recent report of a case explained the blistering in hanging as being the effect of 'pinching'[11].

Peri-ligature injuries have been often associated with various grades of injury to underlying soft tissue of the neck. Previous studies from India[4,6] reported that the incidence of fracture of hyoid bone in hanging was (16% and 11.63%). There was no injury to hyoid or thyroid in our present case. Fracture of hyoid is a significant finding in the cases of strangulation (more common in manual or throttling than by ligature). Fracture of hyoid in hanging is more often dependent on the morphology and morphometry of the bone[4].

Injuries to cervical structures have been attributed to additional axial traction and radial shearing forces of the tightening noose. Complete decapitation can occur in rare cases where the body weight is appreciably more and ligature material is inelastic and/or thin. This may also occur in fall from a considerable height or sudden jerk in free swinging from a high point of suspension. One such case of decapitation in hanging has been reported earlier[12]. The same mechanism comes in to play when a heavy body is suspended from a point by a thin tough ligature material. The fall may not be significant to cause decapitation. Instead, it produces superficial laceration of the neck tissue. The underlying thyro-hyoid complex acts as an anvil and splits the tissue as found in the present case.

The plausible mechanism of the split laceration is the compressive force acting almost vertically on the neck structures, splitting the tissue that is supported by the underlying thyro-hyoid complex. The swinging of the body suspended by a thin firm ligature material also contributed to the tissue damage.

The following differential diagnosis should be considered in the cases where such peri-ligature injuries are encountered.

1. Post-mortem artefact in the form of incised wound during bringing down the body. One should look for the vital signs.
2. It can mimic wound of entry of a bullet likely to be misinterpreted by the untrained eye. This can be ruled out by careful dissection.
3. As a hesitation cut (self-inflicted incised wound) of complex suicide.
4. Attempted tracheotomy in a near hanging.

The peri-ligature split-laceration of the deep cervical fascia, which was found in the present case, is a new observation in hanging. This requires further study. To the best of our knowledge, no such case has been reported earlier. Due caution should be exercised while examining such peri-ligature findings in the cases of hanging.

CONCLUSION

Hanging is the commonest form of asphyxial death encountered in routine forensic practice. Though rare, laceration of the cervical region is a recognised peri-ligature injury in hanging. These peri-ligature findings are also important and should be noted and studied carefully along with the primary ligature mark and other external and internal injuries. Those might be of help in reconstructing the circumstance, and hence the nature of death in hanging.

The primary contention of this case report is to sensitise the forensic pathologists that peri-ligature injuries are common and should not be over-diagnosed at autopsy.

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