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Case report

Medical research

### Fracture-dislocation of cervical vertebra in a case of accidental strangulation by chunni: A case report

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#### ABSTRACT

Accidental ligature strangulation in adults though uncommon, is occasionally reported amongst agricultural workers working adjacent to machinery and circumstantial evidence alone sufficiently indicates the accidental nature of the occurrence. While it is recognized that fracture and dislocation of the cervical vertebra are seen in judicial hanging or hanging associated with a long drop, it is not routinely reported in ligature strangulation. In the present case, a 48 year-old female was accidentally strangled while she was working in the field by the side of a crop thresher when her *chunni* accidentally got stuck (from behind) in the thrasher belt, pulling her towards it by the neck thereby strangling her. She became unconscious & while being brought to the hospital, she expired on the way. The autopsy revealed fracture and dislocation of the 5th cervical vertebra with extensive bruising of the deep muscles of the neck and fracture of greater horn of hyoid bone apart from the ligature mark around the neck. Fracture and dislocation of the cervical vertebra in accidental ligature strangulation by *chunni* is a rare occurrence and not reported routinely in cases of accidental strangulation.

**KEYWORDS:** Ligature strangulation; Accidental; Chunni; Crop thresher; Cervical vertebra fracture.

#### INTRODUCTION

Strangulation is a constriction of the neck by a ligature without suspension of the body, the constricting force being applied directly to the ligature.[1] Strangulations are almost always homicidal, except in children where they tend to be accidental. Strangulations may rarely be accidental, as in work place accidents in which a tie or other article of clothing is caught on machinery.[2] While it is recognized that fracture and dislocation of the cervical vertebra are seen in judicial hangings or hangings associated with long drop, it is not usually reported in ligature strangulation.[3] A case of

fracture and dislocation of the cervical vertebra and fracture of the greater horn of hyoid bone in accidental ligature strangulation due to entrapment of a *chunni* (a long scarf worn around the neck by Indian women) in the moving belt of a crop thresher is presented.

#### CASE REPORT

This paper presents a case of a female, aged 48 years who, while working near a crop thresher accidentally got strangled when the loose end of her *chunni* got entangled in the moving thrasher belt. She lost her consciousness and was immediately brought to the A

& E Dept., PGIMS, Rohtak where she was declared 'brought dead'. The incident was witnessed by her son who was also working nearby. Her body was sent to the mortuary for autopsy after preliminary police investigation.

### AUTOPSY FINDINGS

On external examination, both eyes were partially open. Sub-conjunctival petechial hemorrhages were present in the right eye. Mouth was closed. Postmortem lividity was present on the back except over the areas of contact with the underlying surface and it was not yet fixed. A reddish abraded grooved ligature mark was present over the front of neck at the level of thyroid cartilage situated at a level 6 cm below the center of chin in midline. (Figure- 1) It extended backwards on both sides of neck to completely encircle it in the transverse plane, at the level of posterior hairline. It was situated 5 cm below the right angle of mandible, 4 cm below the left angle

of mandible and 6 cm below the external occipital protuberance. The ligature mark was dry and hard with its width varying from 0.8 to 1.5 cm. On dissection of neck tissue, underlying tissues were ecchymosed and contusion was present over strap muscles of neck corresponding to ligature mark.(Figure-2) There was haemorrhagic infiltration over the laryngo-tracheal structures. On further dissection, fracture of the right greater horn of hyoid bone was present at the junction of inner 2/3<sup>rd</sup> and outer 1/3<sup>rd</sup> region. (Figure-3) There was a fracture-dislocation of the 5<sup>th</sup> cervical vertebra (Figure-4), with an associated injury to the spinal cord corresponding to the fractured cervical vertebra. Besides the above ligature mark, reddish abrasions were also noticed over the mid-back and left scapular regions. (Figure-5) Mucosa of the respiratory tract was congested. Visceral organs were congested. Lungs and brain were congested. The victim died due to asphyxia as a result of strangulation by ligature.



**Figure 1:** Transverse ligature mark of strangulation over neck.



**Figure 2:** Transverse ligature mark of strangulation over neck.



**Figure 3:** Ecchymosis and contusion over strap muscles of neck corresponding to ligature mark.



**Figure 4:** Fracture of the right greater horn of hyoid bone.



**Figure 5:** Fracture-dislocation of the 5<sup>th</sup> cervical vertebra.



**Figure 6:** Abrasions over the mid and left upper back regions.

## DISCUSSION AND CONCLUSION

This is an unusual case of accidental ligature strangulation with fracture and dislocation of the cervical vertebra along with fracture of the greater horn of hyoid bone. Accidental strangulation though rare, is occasionally reported and the circumstantial evidence alone can sufficiently indicate the accidental nature of the occurrence.[4] The first reported case of accidental strangulation was that of the world famous dancer Isadora Duncan who died on 14 September 1929. The long scarf, which she was wearing, was caught in the wire wheels of her Buggati car, stopping the vehicle. Isadora died on the spot and was later found to have sustained a *fractured larynx and carotid artery injury – “Isadora Duncan Syndrome”*. [5] Bhullar et al., [6] Aggarwal et al., [7] Kohli et al., [8] Agrawal et al. [9] and Gupta et al. [10] also reported a few cases of accidental ligature strangulation due to entanglement of the chunni while moving in a vehicle like a rickshaw, motorcycle and bicycle. All these cases of accidental strangulation occurred on the road and the victims died immediately due to asphyxiation but without cervical spine injury except in the case of Gupta et al. [10] in which there was only a dislocation between the 2nd and 3rd cervical vertebrae. In another reported case of accidental ligature strangulation, a 15 year-old female was accidentally strangled when her chunni was caught in a rear wheel of a motorcycle while sitting on the pillion. The victim was hospitalized in an unconscious condition and survived for 4 days,

and had a fracture and dislocation of the cervical vertebra associated with spinal cord injury. [11] A few more cases of accidental ligature strangulation have been reported, in which the article of clothing was caught in the moving machine, such as a shawl in the crop thresher in the agriculture field, [3] a chunni in a moving electrical grinder at home [12] and a head scarf in an ironing machine in the hospital laundry room. [13] But none of these cases had a cervical spine injury. There was only a fracture of the hyoid bone and cricoid cartilage in accidental ligature strangulation by the ironing machine. In the present case, there was a fracture-dislocation of the lower cervical vertebra along with fracture of the greater horn of hyoid bone. This was due to a sudden jerk on the neck leading to hyper-extension injury to the neck as the head was being snapped back due to the entangled chunni and as the machine-belt of the thrasher continued to move forward. Fracture of the cervical vertebra and greater horn of hyoid bone in a case of accidental ligature strangulation is quite uncommon and not reported routinely. In Conclusion, this accidental death highlights that these kinds of machines need to be produced with increased safety mechanism and people using them should be educated on hazards of working with machinery as well as using safety measures and alteration in dress to prevent loose, flowing ends from getting caught in machinery. This often total injury can be prevented largely through public awareness and education.

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