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Survival of a victim of Isadora Duncan syndrome: A case report

Anand B Mugadlimath[1], Mandar Ramchandra Sane[2], Sunil M Kallur[3] and Mallikarjun N Patil[4]

Abstract

Incidents of accidental strangulation by uncovered (open-spoked) wheels of vehicles are not uncommon but survival following such incidents is quite a rare phenomenon. The possibility of death from strangulation by a scarf getting caught in the wheel spokes of a vehicle was brought to the public's attention when the world famous dancer Isadora Duncan died on 14 September 1929. Cycle-powered rickshaws, bicycles and bullock-carts remain common forms of transport in India. However, the uncovered spokes of the vehicle wheel can trap the dupatta/chunni/odhani (long scarf worn around neck) worn by Indian women. A number of cases of fatal accidental strangulation have been described by different authors involving vehicles like cycle-powered rickshaws, bicycles and bullock-carts, with very few cases of reported survivors. Here we report a case of accidental strangulation involving a young girl with the dupatta getting caught in moving wheel of a bullock-cart, in which the victim survived in spite of severe injury to neck structures.

Keywords

Asphyxia, accidental strangulation, Isadora Duncan syndrome

Introduction

Incidents of accidental strangulation by uncovered wheels of vehicles are not uncommon but survival following such incidents is quite a rare phenomenon.[1] The possibility of death from strangulation by a scarf getting caught in the wheel spokes of a vehicle was brought to the public's attention when the world famous dancer Isadora Duncan died on 14 September 1929.[2]

Cycle-powered rickshaws, bicycles and bullock-carts remain common forms of transport in of India. Dupatta also called as chunni or odhani is a long scarf worn around neck by women in the Indian subcontinent; the middle part of the scarf goes in front of the woman's chest, and both ends go back over her shoulders and hang loosely at the back. The uncovered spokes of the vehicle wheel can trap the dupatta and cause strangulation. A number of such cases of fatal accidental strangulations[2–7] have been described with very few reports of survivors.[1,8,9]

Here we describe a case with rare outcome, in which a young girl's dupatta accidentally got entangled in the spokes of unprotected wheel of a bullock-cart and strangled her neck. She survived in spite of severe injury to neck structures.

Case report

A 17-year-old girl was returning from her farm-house with family in a bullock-cart. Accidentally, the dupatta she was wearing got stuck in the moving wheel of the bullock-cart and constricted her neck. Her family members quickly acted and rescued her by removing the ligature (dupatta) and she was immediately rushed to our hospital. The girl had lost consciousness during and a few minutes after the incident. She also had an episode of convulsions and vomited twice.

On arrival at the hospital, the girl was found to be drowsy and she complained of pain in her throat and weakness of both the upper limbs. Her voice was hoarse and vital signs were within normal limits (BP – 110/70, radial pulse – 78/min, SpO_2 – 96% and RR – 24/min). Clinical examination of cardiovascular, per-abdomen and respiratory system was unremarkable.

Her neck showed a circumferential prominent ligature-mark (Figure 1) in the form of abrasion, which was more prominent on the right side, in the form of superficial laceration (Figure 2).

[1]Dept. of Forensic Medicine, Ashwini Rural Medical College (ARMC), India
[2]Kempegowda Institute of Medical Sciences, India
[3]Sri B M Patil Medical College, India
[4]S. Nijalingappa Medical College, India

Corresponding author:
Anand B Mugadlimath, Associate Professor, Dept. of Forensic Medicine, Ashwini Rural Medical College (ARMC), Kumbhari, Solapur, Maharashtra, India
Email: dranandmdfm@gmail.com

Figure 1. Ligature mark on the left side of neck.

Figure 2. Ligature mark on the right side of neck.

There was circumferential edema of neck. The soft tissues of neck were swollen and contused on the right side exposing platysma muscle. There was a bite on right margin of tongue, about 1.5 cm from the tip. After examination a consultant neurologist gave opinion of transient paraplegia due to concussion of spinal cord, secondary to constriction of the neck. On examination by consultant otorhinolaryngologist, laryngeal apparatus and airway were found adequate.

The neurologist suggested MRI imaging of the neck and cervical spine which revealed following injuries – haemorrhages into the soft tissues of neck, more on right lateral part of neck; complete tear of the right sternocliedomastoid, right scalene muscles and haemorrhages into the lymph nodes on right side of neck. There was no injury to cervical vertebra or spinal cord.

She was treated conservatively along with intravenous Prednisone for possible concussion of spinal cord. Patient went home Against Medical Advice (AMA) from the hospital after 4 days of admission because of financial constraints. The patient was contacted after 4 weeks of discharge and was found to be in fine fettle except for torticollis developed on the right side.

Discussion

The first case of death from strangulation by a long scarf getting caught in the wheel spokes of a vehicle was brought to the public's attention when the world famous dancer Isadora Duncan died because of the long scarf, which she was wearing, got caught in the wire wheels of her Buggati car. Isadora died at the scene and was later found to have sustained a fractured larynx and carotid artery injury.[2]

Improvements in vehicle designs have drastically reduced such cases in developed countries. However, due to continued use of vehicles with primitive designs in developing countries, unfortunate victims continue to succumb. Cycle-powered rickshaws, two-wheelers and bullock-carts still remain common forms of transport, particularly in rural India. The occupant sitting close to wheels is always in danger especially if wearing long scarf. The uncovered spokes of vehicle wheels can trap the dupatta. A number of such cases of accidental strangulation have been described and most of such cases of accidental strangulation had severe injury with loss of consciousness from the onset to fatal outcome[2–7] with very few cases of recorded survivor.[1,8,9] A 10-year study of accidental strangulations by dupatta getting caught in the wheels of running vehicles, from India, describes unconsciousness and invariable death of the victims as features common to all the cases studied.[7]

In a rare survivor following accidental ligature strangulation while riding a bicycle, the victim escaped with minimal injuries to neck as the compression was partial and unilateral.[8] It is apparent from the literature that almost all fatal cases of accidental strangulation had rapid strangulation (from rotatory part of a machine, unprotected wheel of vehicles),[1,2,5,6,10] and the victims were in sitting position.[1,4,9,11] In a study by Habal et al.[12] of accidental strangulations involving scarves, 9 out of 11 victims were female. All of them had fatal outcome.

In a case report by Bardale et al.[13] the victim, a 13-year-old girl, suffered from accidental ligature strangulation (by dupatta) while travelling in bullock-cart; she remained unconscious after the incident and died after 24 hours of admission to the hospital. At autopsy, ligature mark was on the anterolateral part of neck. Internal examination showed haemorrhagic infiltration in the neck muscles. There was separation of C4-C5 vertebral joint with complete transection of spinal cord at the corresponding level.

According to Yen et al.[14] MRI scan (neck including cervical spine) signs of life-threatening strangulation were subcutaneous haemorrhage, haemorrhage into platysma, intramuscular haemorrhage and

lymph node haemorrhage. According to Christe et al.[15] the best radiological signs on MRI indicating life-threatening strangulation were intramuscular haemorrhage/edema, swelling of platysma and intracutaneous bleeding (all $p = 0.02$) followed by subcutaneous bleeding ($p = 0.034$) and haemorrhagic lymph nodes ($p = 0.04$). In accordance with both the above described studies the findings of MRI scan in the present case are consistent with radiological signs of severe/life-threatening strangulation.

Plattner et al.[16] studied 134 cases of survival following strangulation from 1987 to 2002, and according to their observation the majority of cases showed superficial skin lesion and injury of soft tissues. Ninety-five cases showed a continuum of findings from superficial skin lesions to petechiae and signs of cerebral impairment. But none of their subjects showed signs of extensive neck injury as seen in our case report. In the present case, survival of the patient in spite of severe injury to neck structures with loss of consciousness can be attributed to factors such as:

1. Sideway constriction of neck, with more severe injury on right side. This factor is more important because the laryngeal apparatus can withstand lateral compression pressure but not anteroposterior compression because of its natural lateral mobility.
2. The bullock-cart is a relatively slow moving vehicle.
3. Quick release of the constricting force by family members.

Conclusion and suggestions

Survival following accidental strangulation is rare, especially with severe injury to neck structures as in this case; possible reasons for survival in the present case have been explained.

Neither we can stop the use of vehicles nor can we pass a legislation to ban the wearing of traditional attire such as the dupatta. But we can educate the public about the life-saving precautions that could be observed while wearing a dupatta and travelling in an open vehicle. The design of the vehicles, which are potentially dangerous, can be modified; safety guards to the open wheels of the vehicle can prevent fatal accidents of this kind.

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Declaration of conflicting interests

The authors state that there is no actual or potential competing interest including any financial, personal or other relationships with other people or organisations that could inappropriately influence, or be perceived to influence, their work.

Guarantor

Anand Mugadlimath is named as the guarantor for the work. The guarantor accepts full responsibility for the work and/or the conduct of the study, had access to the data and controlled the decision to publish.

Contributorship

All the authors contributed in the conception, analysis and interpretation of the case described, as well as in drafting and revising the manuscript and have approved the final version.

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