

A case of near-hanging

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ABSTRACT

Hanging is the suspension of a person by a noose or ligature around the neck and has been a common method of capital punishment since medieval times. Hanging is also a common method of suicide/homicide worldwide as also in India. We report a case of attempted suicidal hanging admitted in our intensive care unit. The patient, a 32-year old male, presented with poor clinical status, in gasping condition, hypoxemic and required immediate intubation, resuscitation, assisted ventilation and intensive care treatment. He received standard supportive intensive care and made a full clinical recovery without any neurological deficit. The purpose of the case report is to emphasize that the cases of near-hanging need to be aggressively resuscitated and managed irrespective of dismal initial presentation.

Keywords: *Asphyxia, Near-Hanging, Resuscitation, Suicide.*

Approximately 800,000 people commit or attempt suicide every year worldwide; of these approximately 134,000 (17%) are Indians [1,2]. Between 1987 and 2007, the suicide rate increased from 7.9 to 10.3 per 100,000 with higher rates in southern and eastern states of India [3]. 'Hanging' (45.6%), Consuming 'Poison' (27.9%), 'Self-Immolation' (7.2%) and 'Drowning' (5.4%) were the prominent modes of committing suicides during 2015 [2].

Hanging is defined as death due to external pressure on the neck when a ligature is applied to the neck of a wholly or partly suspended individual [4,5]. Hanging can be classified as either complete or incomplete. When the whole body hangs off the ground and the entire weight of the victim is suspended at the neck, the hanging is said to be complete. Incomplete hangings imply that some part of the body is touching the ground and that the weight of the victim is not fully supported by the neck. Hanging may also be classified by intent (e.g. homicidal, suicidal, autoerotic, and accidental). The term "near-hanging" refers to patients who survive a hanging injury long enough to reach the hospital [4,5]. Previous studies on near hanging cases show that if they are brought down promptly and treated vigorously, chances for survival are good [6,7]. We share our experience of managing a patient of near hanging in our intensive care unit, a rare case of survival after an attempted suicide by hanging.

CASE REPORT

A 32-year-old male was brought by ambulance about six-months back with an alleged history of hanging. He was found hanging by a rope from the ceiling fan in his house by his brother who

brought him down by cutting the rope. He had been hanging for an unknown period of time.

The patient was 5'7" in height and 69.5 Kg in weight. At the time of admission, he was unconscious; both pupils were mid-dilated and unresponsive to light. Glasgow Coma Scale (GCS) was calculated to 3/15, (E1V1M3). There was also an episode of generalized tonic-clonic seizure in the hospital casualty. There was presence of central and peripheral cyanosis. Oxygen saturation at room air was 37% by a pulse oximeter. His pulse was 92 beats/ min and blood pressure was 90/50 mm of Hg. There was no sub-conjunctival hemorrhage or clinical evidence of cervical spinal injury. Local examination revealed one oblique bluish-purple color ligature mark around the neck measuring from 0.5 to 1.5 cm in width and 20 cm in length. The mark was more or less horizontal on both sides of the neck, just above the thyroid cartilage, it ran obliquely upwards and backward and it became very faint on the back of the neck and untraceable just behind the left mastoid prominence, indicating the site of the knot (Fig. 1).

The patient was intubated immediately and put on mechanical ventilatory support. Neurological examination revealed hypotonia and areflexia of all the limbs with bilateral positive Babinski's sign. A few crackles were heard at the right base on examination of the respiratory system. Other systemic examinations including funduscopic examination were unremarkable.

The patient was ventilated mechanically and treated with antiepileptics, antibiotics and fluid resuscitation. After about 24 hours of vigorous treatment, he regained consciousness. He was extubated and was able to maintain oxygen saturation on supplemental oxygen. Chest X-ray, Computerised Tomography (CT) scan head and cervical spine X-ray were normal. Though



Figure 1: Ligature mark around the neck

there was a transient rise in total bilirubin level (2.7mg %), other biochemical parameters were found to be within normal limits. He was discharged after ten days with full clinical recovery. Psychiatric consultation was sought prior to discharge and psychiatric counseling was continued as an outpatient after discharge.

DISCUSSION

The incidence of hanging, as a method of suicide especially amongst young adults, is high with a very low failure rate. The average fatal period is about 3 to 5 minutes. Death occurs immediately if there are fracture and dislocation of the cervical vertebrae or heart block [8]. In classical judicial hanging, which involves a drop from a height that is more than that of the individual's, the death occurs due to fracture of the cervical spine and/or transection of the spinal cord. Fracture of the cervical spine in hanging usually causes an injury known as hangman's fracture (fracture of both pedicle or pars interarticularis of the axis vertebra).

In near-hanging, which involves a drop from a height less than that of the victim's, the morbidity and mortality result from compression of the neck structures. Other pathophysiological mechanisms are venous obstruction, laryngeal edema and delayed airway obstruction (due to loss of neck muscle tone), carotid sinus stimulation causing increased vagal tone, local injuries (thyroid cartilage/hyoid bone fracture/laryngeal rupture), vascular compression with brain asphyxia (believed to be the main mechanism) [9]. In addition, other complications such as aspiration pneumonia, adult respiratory distress syndrome (ARDS), pulmonary oedema secondary to negative intrathoracic pressure, secondary cerebral injury (diffuse because of cerebral oedema and generalized cerebral hypoxia because of arterial dissection or arterial spasm or subarachnoid haemorrhage), hyperthermia, status

epilepticus, bleeding into vessel wall or intima of carotid arteries or lower oesophageal rupture have also been described [10].

While the overall survival rates described in patients with near-hanging is optimistic and ranges from 70% to 100%, factors predicting clinical outcomes have been variably described and remain largely inconsistent, the most controversial of them being GCS score. A GCS score of 3 at presentation has been described as a predictor of poor clinical outcome independently in three case series [11–13]. Other poor prognostic factors are long hanging time, cardiopulmonary arrest at presentation, presence of cervical spine injury, drop height greater than that of the victim's, presentation beyond 4 hrs, hypotension on arrival, need for cardiopulmonary resuscitation, anoxic brain injury and cerebral edema on CT scan and $\text{PaO}_2/\text{FiO}_2$ ratio of <100 at admission [12–17]. Type of ligature mark has also been described as having potential prognostic significance, with complete circumferential marks reflecting severe arterial occlusion and cerebral anoxia likely associated with poorer clinical outcomes as against partial marks [16,17].

However, considering that survival rates of up to 32% described in patients with GCS scores of 3 at presentation, aggressive resuscitation of all near-hanging victims, irrespective of their GCS score, must be carried out. In the absence of a dedicated guideline for the management of near-hanging patients, the approach described is basically on lines of the advanced trauma life support (ATLS) guidelines [18]. The management primarily includes immobilization of neck, securing airway by endotracheal intubation, positive-pressure ventilation, maintenance of fluid and electrolyte balance, euglycemia and normocarbica (to control intracranial tension) [9,10]. Intravenous fluids should be restricted and diuretics, with or without mannitol or hypertonic saline, may be indicated to reduce the development of cerebral edema [19]. Short-acting sympatholytic drugs may be chosen over vasodilators for control of hypertension, as the vasodilators may result in a rise of the intracranial pressure. The role of prophylactic anticonvulsants, naloxone, calcium channel blockers, and steroids is still controversial [10,19]. A plain radiograph of the neck should be taken to rule out injury to the cervical spine. Further radiological evaluation, including CT scan of the head and neck, may be required if there is no neurological improvement within 24 hrs of admission [9,13,15].

CONCLUSION

Our clinical experience with a patient of near hanging, as reported here, is consistent with the existing knowledge and reiterates optimistic final outcomes with a standard management protocol. Accordingly, all patients of near-hanging, even those with severe initial neurological deficits and gloomy outlook, must be aggressively managed as the recovery is often complete.

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