Case Report

DELAYED DEATH DUE TO FATAL PULMONARY EDEMA IN NEAR HANGING
Dr. NB Kumar, Dr. CV Tingne, Dr. PS Ghormade, Dr. AN Keoliya

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Abstract
Hanging is the commonest mode of suicide in India. It is a painless method of committing suicide and death is instantaneous. Only few persons survive this episode, if rescued promptly and usually die at a later stage, which more precisely can be called delayed hanging death. Delayed death in hanging being a rare phenomenon has been reported infrequently in the literature. We report a case of a young adult male who was rescued within minutes of hanging but succumbed to the consequent complications.

Keywords: Near hanging, delayed death, suicide, pulmonary edema,

Introduction
Hanging has become the commonest method of suicide in India followed by poison ingestion. Statistics show an increasing incidence in suicidal hanging over past three years. In the year 2012, 37.0 % people committed suicide by hanging which is 4 % more than the previous year (33.2%). 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. The term “near hanging” refers to patients who survive a hanging injury long enough to reach the hospital.

There are a number of mechanisms by which hanging may cause death, which may act independently or in concert. These include: stretching of the carotid sinus causing reflex cardiac arrest; occlusion of the carotid (and possibly vertebral) arteries; venous occlusion; airway obstruction resulting from pushing the base of the tongue against the roof of the pharynx or from crushing of the larynx or trachea; and finally spinal cord–brainstem disruption. In hanging delayed death occurs due to aspiration pneumonia, infection, hypoxic encephalopathy, oedema of the lungs, oedema of larynx, infarction or abscess of the brain and cerebral softening. We present a case of a young adult male who developed fatal complications even though he was rescued within minutes of attempted hanging.

Case report
A 27 year old male was brought to emergency department with altered sensorium, restlessness and in gasping state with an alleged history of attempted suicidal hanging. He was rescued by his neighbors within minutes of hanging and was brought to hospital within 20 minutes. He was suffering from depression since 2 years and was under medication for the same. He was admitted in intensive care unit and put on a ventilator. He was aggressively managed and even though his sensorium improved to some extent he succumbed to the complications on 6th day. A medicolegal autopsy was performed on the deceased at the Department of Forensic Medicine, Indira Gandhi Government Medical College, Nagpur.

On external examination an obliquely placed ligature mark was present over the neck, above the level of thyroid cartilage running backwards and upwards towards nape of neck having dimensions 23 cm x 2 cm. It was a healing abrasion, with a brownish dried scab surrounded by a puckered skin. Mark was non-continuous for 8 cm over the back of neck. It was situated 5.5 cm below chin, 4 cm below tip of right mastoid and 3cm below tip of left mastoid process. Therapeutic intravenous injection marks were present over dorsum of both hands.
On internal examination all organs were congested. Brain was soft and edematous. Lungs were edematous weighing 550gms (right) and 480gms (left); on cut section oozing of fine frothy fluid was present along with red to grey hepatization in lower lobes of both lungs. Stomach was empty without any peculiar odour. All neck structures were intact. Histopathological samples from lungs revealed edema (Photo 1) and evidence of pneumonitis (Photo 2) while those from brain had evidence of edema (Photo 3). No specific pathology was observed in heart and kidneys.

![Photo 1: Lung showing congestion and oedema](image1)

![Photo 2: Lung showing congestion and interstitial mononuclear infiltration](image2)

![Photo 3: Brain showing congestion and oedema](image3)

**Discussion**

Victims of hanging usually die within a period of three to five minutes. Death in hanging occurs earliest when there is dislocation of the cervical vertebrae and injury to medulla leading to failure of respiratory centre. Deaths due to closure of cervical and vertebral arteries too occur quickly but not as quick as in injury to cervical vertebrae. Ligature at the level of cricoid cartilage causes complete asphyxiation earliest. When the level is over larynx the fatal period is slightly more and is maximum when the ligature is between chin and hyoid.

In suicidal hangings, there is often no or minimal drop height. Compression of the soft tissues of the neck results in jugular venous obstruction (stagnant hypoxia) and loss of consciousness. The body then becomes limp from loss of muscle tone, which further tightens the ligature around the neck, resulting in carotid arterial obstruction, with or without airway closure, cerebral hypoxia and death. The duration of hanging correlates with outcome, and several small studies have shown hanging times of less than 5 minutes predicts good outcome.

Delayed deaths in hanging ranging from 18 hours to 39 days have been described in literature. In the present case the deceased was rescued within minutes of hanging and was brought to a tertiary care centre within 20 minutes. He had altered sensorium and respiratory distress on admission. He was resuscitated and aggressively managed in ICU. Slight
improvement was seen in sensorium but respiratory distress owing to pulmonary edema and pneumonitis could not be countered to the extent of successful revival and he succumbed on 6th day of admission.

Most of the patients develop respiratory and neurological complications immediately after the incident, the severity of which varies proportionally to the quickness of ligature removal. Pulmonary oedema as observed in our case is one of the most common immediate complication in patients following their rescue from acute airway obstruction or suicidal hanging. Its onset is very rapid, generally appears within minutes of the event but sometimes it may be delayed. The cause of delay is not clear but it might be related to rate of onset of oedema and severity of airway obstruction. The exact mechanism of development of pulmonary oedema after rescue from hanging or strangulation is still not clear.

Conclusion

Delayed hanging death occurs due to a variety of mechanisms. Pulmonary edema is one of them. Survival of such victims not only depends on the early relieving of neck compression but also on prompt resuscitation measures. This case emphasizes the importance of forensic medicine experts to give final opinion regarding the cause of death by post mortem examination in cases of delayed hanging.

References