

## Near hanging with Multiple Tentative Cuts: A Case Series

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### Abstract

Suicide is one of the major global health issues specially in countries having low to medium socioeconomic condition. Hanging is method of choice for adults to commit suicide. Near hanging defined as person who survive a hanging injury for enough time to reach hospital. Tentative cut or self-inflicted injury is an intentional and direct injury to own's body part. It is also known as self-harm, self-wounding, moderate self-mutilation and parasuicide. Various factors responsible for high mortality in near hanging are low systolic blood pressure (<90), injury severity score (ISS) >15, Glasgow coma scale (GCS) <8, hypoxic brain injury on CT scan. Immediate arrival to hospital and aggressive management of near hanging and its complication can improve the final outcome.

**Keywords:** Near-hanging, Self-harm, Suicidal, Tentative cuts

### Introduction

Suicide is one of the major global health issues specially in countries having low to medium socioeconomic condition. Suicide is at 4<sup>th</sup> spot for cause of death among age group 15-29 years. 77% of worldwide suicide occur in countries having low to medium socioeconomic condition. Pesticide ingestion, hanging and firearm are leading methods of suicide in the whole world<sup>1</sup>. Various methods of suicide in India are pesticides ingestion, firearm, hanging, jumping from bridge, jumping in front of

train<sup>2</sup>. Hanging is method of choice in India for adults to commit suicide<sup>3</sup>. Hanging has higher success rate in comparison to other methods of suicide<sup>4,5</sup>. Hanging is defined as form of asphyxia caused by suspension of body by a ligature which constrict the neck and the constricting force being the body weight<sup>6</sup>. Near hanging defined as person who survive a hanging injury for enough time to reach hospital<sup>3</sup>. Cause of morbidity and mortality in hanging is due to venous compression, cerebral hypoxia, injury to laryngeal apparatus, laryngeal oedema resulting into

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respiratory obstruction, vagal inhibition and many other pulmonary complications such as aspiration pneumonia, pulmonary oedema, acute respiratory distress syndrome, status epilepticus, subarachnoid haemorrhage, hyperthermia etc<sup>7</sup>. Various factors responsible for high mortality in near hanging are low systolic blood pressure (<90), injury severity score (ISS) >15, Glassgow coma scale (GCS) <8, hypoxic brain injury on CT scan<sup>7,8</sup>.

Tentative cuts or self-inflicted injury is an intentional and direct injury to own's body part without intention of suicide<sup>9</sup>. It is also known as self-harm<sup>10</sup>, self-wounding<sup>11</sup>, moderate self-mutilation<sup>12</sup> and parasuicide<sup>13</sup>. This stereotypic behaviour not only seen in psychiatric populations but also common in nonclinical populations<sup>14</sup>. Skin cutting is most common self-inflicted injury. Other forms of self-inflicted injuries are burning, hitting body part, scratching and hindering the wound healing process<sup>9,15</sup>.

### Case Description:

#### Case 1.

A 19 years old female was admitted in female medicine ward at Gandhi Memorial and associated Hospital, King George's Medical University (KGMU) as a case of suspected hanging. A reference came to department of forensic medicine and toxicology, KGMU for examination, evaluation and giving expert opinion.

#### Examination of case no. 1

Examined the patient on bedside in medicine female ward, at Gandhi Memorial & associated Hospital, King George's Medical University (KGMU). Patient was conscious and well oriented to time, place and person. GCS was 14/15, BP was 149/97 mm Hg, pulse rate 101 and SPO<sub>2</sub> was 96%.

**Examination of local injuries:** On examination following injuries noted-

1. A reddish-brown ligature mark of dimension 8 cm×3 to 3.5 cm was present in front of neck, above thyroid cartilage. Ligature mark was 6cm below chin. From right ear lobule ligature mark was 10 cm vertically downward on right side and from left ear lobule ligature was 8.5cm vertically downward on left side.

There was interruption of 26 cm on back of neck. Ligature mark was moving obliquely upward from right front side of neck to left front side of neck. (Image no. 1)

2. 2 linear old abrasions of size 4 cm parallel to each other present on ventral aspect of left wrist.(Image no. 2)

**Blood investigations:** Blood investigation- total leucocyte count (TLC) was raised (15900 cells/mm<sup>3</sup>), neutrophil 82%, lymphocyte 14%, serum Na<sup>+</sup> was high (155.3mmol/l). Rest of the blood parameter was within normal range.

**Diagnosis and Opinion:** 1. Nature, pattern and characteristic of ligature mark (Injury No.1) is suggestive of hanging. 2. Injury no. 2 is suggestive of tentative cuts.

**Advise:** Patient was advised for psychiatric evaluation.

#### Case 2.

A 32 years old male was admitted in medicine male ward at Gandhi Memorial and associated Hospital, King George's Medical University (KGMU) as a case of suspected hanging. A reference came to department of forensic medicine and toxicology, KGMU for examination, evaluation and giving expert opinion.

#### Examination of case no. 2

Examined the patient 32-year-old male on bedside in medicine male ward at Gandhi Memorial & associated Hospital, King George's Medical University (KGMU). Patient was conscious but not well oriented to time, place and person. GCS was E<sub>3</sub>V<sub>1</sub>M<sub>4</sub>, BP was 104/60 mm Hg, pulse rate 84 and SPO<sub>2</sub> was 86%.

**Examination of local injuries:** On examination following injuries noted-

1. A reddish-brown ligature mark of dimension 24 cm×2 cm was present in front of neck, above thyroid cartilage. Ligature mark was 6 cm below chin. From right ear lobule ligature mark was 6 cm vertically downward on right side and from left ear lobule ligature was 5 cm vertically downward on left side. There was interruption of 13 cm on back of neck. Ligature mark was directed obliquely

upward from right front side of neck to left front side of neck. (Image no. 3 & 4)

- Multiple linear old abrasions of size 2 cm to 4 cm parallel to each other were present on ventral aspect of left wrist.

**Blood investigations:** Blood investigation- total leucocyte count (TLC) was raised (18200 cells/mm<sup>3</sup>), neutrophil 88%, lymphocyte 10%. serum electrolyte and other blood parameters were within normal range.

**Diagnosis and Opinion:** 1. Nature, pattern and characteristic of ligature mark (Injury No.1) is suggestive of hanging. 2. Injury no. 2 is suggestive of tentative cuts.

**Advise:** Patient was advised for psychiatric evaluation.

### Case 3.

A 22-year-old male was admitted in medicine male ward at Gandhi Memorial and associated Hospital, King George's Medical University (KGMU) as a case of suspected hanging. A reference came to department of forensic medicine and toxicology, KGMU for examination, evaluation and giving expert opinion.

### Examination of case no. 3

Examined the patient 22-year-old female on bedside. Patient was conscious and well oriented to time, place and person. GCS was E<sub>4</sub>V5M5, BP was 118/94 mm Hg, pulse rate 84 and SPO<sub>2</sub> was 91%.

**Examination of local injuries:** On examination following injuries noted-

- A reddish-brown ligature mark of dimension 24 cm×1.5 cm was present in front of neck, above thyroid cartilage. Ligature mark was 7 cm below chin. From right ear lobule ligature mark was 5 cm vertically downward on right side and from left ear lobule ligature was 5 cm vertically downward on left side. There was interruption of 8 cm on back of neck. Ligature mark was directed obliquely upward from left front side of neck to right front side of neck. (Image no. 5)
- Multiple linear old abrasions of size 3 cm to 5 cm parallel to each other were present on ventral aspect of left wrist. (Image no. 6)

**Blood investigations:** Blood investigation- total leucocyte count (TLC) was raised (15100 cells/mm<sup>3</sup>), neutrophil 86%, lymphocyte 12%. Serum sodium was raised (151) other serum electrolyte and blood parameters were within normal range.

**Diagnosis and Opinion:** 1. Nature, pattern, and characteristic of ligature mark (Injury No.1) is suggestive of hanging. 2. Injury no. 2 is suggestive of tentative cuts.

**Advise:** Patient was advised for psychiatric evaluation.



Image no. 1. Showing ligature mark at neck



Image no. 2. Showing tentative cuts at left wrist.



Image no.3. Showing hanging ligature mark at front of neck



**Image no.4. Showing hanging ligature mark at right lateral side of neck**



**Image no.5. Showing hanging ligature mark at front of neck**



**Image no. 6. Showing tentative cuts at left wrist.**

### Discussion

India has highest number of deaths by suicide in the world and most common method of suicide in India is hanging followed by pesticides ingestion<sup>16</sup>. Venous congestion, cerebral hypoxia, laryngeal oedema airway obstruction, laryngeal, laryngeal rupture, vasovagal attack due to stimulation of carotid sinus, fracture of hyoid bone and laryngeal apparatus, pulmonary complication like pulmonary oedema, acute respiratory distress syndrome (ARDS), bronchopneumonia and aspiration pneumonia

are the important reasons behind morbidity and mortality of near hanging<sup>17,18</sup>. Judicial hanging and non-judicial hanging are two major types of hanging. In judicial hanging body drops from height greater than individual height and death is caused by transection of spinal cord. In non-judicial hanging body drop from height less than individual height i.e., insignificant height. Depending on outcome, the non-judicial hanging may fatal or non-fatal. The term near hanging is used for non-fatal nonjudicial hanging<sup>19</sup>. All the discuss cases in the present study were of near hanging.

Characteristic features of non-judicial hanging are ligature mark around the neck and petechial haemorrhage around subconjunctival region due to venous engorgement<sup>20,21</sup>. Petechial haemorrhage and laryngeal fracture are uncommon in near hanging and were not seen in any of the case in our study. Injury of cervical spine is uncommon in near hanging since there was no significant drop from height<sup>22</sup>. Cervical injury was not present in any of the victim in our study. To rule out cervical and laryngeal injuries we advised for plain radiograph of neck and CT scan of head and neck. Overall survival rates of near hanging are about 70 to 100 percent<sup>3</sup>. There are various important predictor of high mortality in near hanging and one of them is Glasgow coma scale (GCS)<sup>7,8</sup>. GCS scores is highly controversial and most inconsistent. Jawaaid, *et al* in their study found that GCS was <8 (defined as poor GCS) in 56 patients out of 101. Almost all the 56 patients required endotracheal intubation. Out of 56 patient 42 completely recovered and 10 had poor neurological outcome<sup>23</sup>. Similarly, Ali *et al*. in their case series found that a GCS score of  $\leq 8$  on arrival of patient was not to have significant association with clinical outcome<sup>24</sup>. A GCS score of 3 at time admission was found to be associated with poor clinical outcome independently in three case series<sup>25,26,27</sup>. In our case series all the three patients had GCS  $\geq 8$  and had good outcome. Other important predictors for outcome are systolic blood pressure (<90), injury severity score (ISS) >15, hypoxic brain injury on CT scan and presentation after 4 hours<sup>7,8,24</sup>. Due to lack of guideline for management of the patient of near-hanging, the approach for management was based on Advanced Trauma Life Support (ATLS) guideline<sup>28</sup> require cervical spine immobilization, airways securing by endotracheal

intubation, fluid and electrolyte balance, glycaemic control and maintain normal arterial carbon dioxide pressure to maintain normal intracranial tension<sup>17,18</sup>. CT head and neck recommended if there is persistent neurological deficit within 24 hours of admission. In our case series we recommended CT scan of head and neck in all the three cases. All the patients of near hanging with or without neurological deficit or respiratory distress must be taken seriously and managed aggressively since the recovery is usually complete.

Tentative cuts are intentional and direct injury to own's body part without intention of suicide and this stereotypic behaviour not only seen in psychiatric populations but also common in nonclinical populations<sup>9,14</sup>. These intentional injuries are indicators of risk of suicide in near future. In our case series all the three patients had tentative over wrist and hence we advised them for psychiatric evaluation.

### Conclusions

Immediate arrival to hospital and immediate management of near hanging patients with standard protocol can definitely improve the outcome. Further management of common complication such as respiratory distress, pulmonary oedema, seizure, and other neurological deficit can improved the final outcome of near hanging patients. Intentional injuries are indicators of risk of suicide in near future hence such patient advised for psychiatric evaluation to reduce the risk of another future self-harm.

**Conflict of interest:** Nil

**Source of Funding:** Nil

### Data Retention Statement

- All data collected for the study were anonymized.
- Particulars of the patients were available only to the authors of this study.
- Patient's confidentiality was maintained during collecting the data.

**Consent:** Informed consent from the family was taken to published the photograph of the patient.

**Abbreviations:** GCS: Glassgow coma scale, CT: Computed tomography, KGMU: King George's Medical University.

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