

## Introduction:

Hanging is one of the leading cause of death in the world accounting for 1 million death annually<sup>1</sup>. In India hanging is the 2<sup>nd</sup> most common method of suicide after poisoning<sup>2</sup>.

Hanging is a violent death produced by suspending the body with ligature around the neck, the constricting force being the weight of the body or a part of body. Hanging can be classified as various types as typical or atypical according to knot position, complete or partial on the basis of degree of suspension, suicidal, accidental or homicidal on the basis of manner of death and others<sup>3</sup>. Death usually occurs due to cervical injury as occurs commonly in judicial hanging<sup>4</sup> or cerebral hypoxia or cardiac arrest (due to vagal stimulation)<sup>5,6</sup> or other complication like aspiration, post obstructive pulmonary oedema, ARDS, seizure<sup>7,8,9,10</sup>. Although it is a common mode of suicide in India, very less data is available on its epidemiology. Here we share our experience of managing 4 cases of hanging over a period of one year.

## Case Study:

### CASE 1

A 14 year old girl presented to ER with alleged history of suicidal hanging followed by loss of consciousness. On presentation she was unconscious (GCS of 6) and her vitals were pulse 160/min., BP of 80/50 mm of Hg, respiratory rate of 34/min and spo2 70% with 5L O2 with bilateral crepts on auscultation. Ligature mark was present around the neck. Following ABC protocol she was immediately intubated to secure airway. Patient was then shifted to ICU and put on mechanical ventilation (VCV-AC) mode. An initial fluid challenge of 1L was given over 1 hour. An indwelling catheter and ryles tube was introduced. Central venous access was secured. Routine blood investigations, ABG, chest X-ray, X-ray cervical spine and CT brain were advised. She was started on vasopressor agents in view of persistent hypotension despite adequate fluid resuscitation. Her chest X-ray showed bilateral diffuse opacities and in view of poor oxygenation in successive ABGs and inability to maintain saturation, ARDS NET protocol was used and lung recruitment measures were started. Patient was sedated with morphine infusion with interruption of brief periods. She was started on antibiotics according to hospital antibiogram as she was spiking fever on 2<sup>nd</sup> day with increase of TC. All of cultures were reported negative.

A neurology opinion was also taken. Her CT brain and X-ray cervical spine were unremarkable. She was also given intermittent boluses of diuretics when her hemodynamics permitted. Other supportive care like heparin was used as DVT prophylaxis, pantoprazole as ulcer prophylaxis and her sugars were targeted between 140 -180mg/dl. Gradually patient's hemodynamic status improved by 3<sup>rd</sup> day and vasopressor were tapered off. Her oxygenation status also improved. She was gradually weaned of ventilator and extubated by 5<sup>th</sup> day and shifted out of ICU on 6<sup>th</sup> day. FOCUS ON: She was treated as a case of post obstructive pulmonary oedema and responded promptly to appropriate therapy which is aimed at reversing hypoxia and removing excess fluid from lung interstitium

## **CASE 2**

A 45 year old male presented to ER with alleged history of suicidal hanging within 2 hours. Duration of hanging was not known. He had history of depression and not talking to anyone for last 6 months. During presentation his GCS was E1V2M5 with pulse of 51/min, BP of 90/60 mm of Hg and respiratory rate of 30/min with stridor but was able to maintain a saturation of 100% with 5L O<sub>2</sub>. Cervical collar was used for precaution and patient was intubated in view of border line GCS and shifted to ICU for further management. He was managed conservatively with antibiotics, nebulisation, steroids and mechanical ventilation. His CT brain and cervical X-ray was unremarkable. His sensorium improved and was extubated on 3<sup>rd</sup> day, shifted out of ICU on day 4<sup>th</sup> and discharged on 5<sup>th</sup> day with advice of psychiatric consultation.

## **CASE 3**

A 35 year old alcoholic male with alleged history of suicidal hanging where hanging time was 2-3 minute and was rescued by his relatives. During presentation he had ligature mark around his neck, had stridor with GCS of E2V2M5, pulse of 120/min. BP of 150/10 mm of Hg. He was intubated in ER and shifted to ICU for further management. He was conservatively managed with nebulisation, antibiotics, steroid and mechanical ventilation. He weaned off ventilator on 3<sup>rd</sup> day. During stay he had alcohol withdrawal which was managed accordingly. He discharged on 4<sup>th</sup> day with advice for psychiatric opinion.

## **CASE 4**

A 15 year old girl with alleged history of hanging presented to ER after 4 and ½

hours of hanging and the duration of hanging was not known. At presentation she was unconscious with GCS of 3, pulse of 163/min. BP of 110/70 mm of Hg and respiratory rate of 40/min. with SPO<sub>2</sub> of 78% at room air. After securing airway in ER she was shifted to ICU for further management. During ICU stay she had convulsion and her neurological status didn't improve. Neurology opinion was sought and MRI was done which showed hypoxic changes. She was being managed conservatively with mechanical ventilation, antibiotic, steroid anticonvulsant and other supportive measures like sugar control, DVT prophylaxis and ulcer prophylaxis. She was planned for tracheostomy. Her outcome was not known as she was lost to follow up.

## **Discussion:**

The term near hanging refers to a patient who initially survives the attempt of hanging and in spite of high associated fatality rate survival is possible<sup>11</sup> with aggressive measurement which include establishment of safe airway, treating pulmonary manifestation and complication, maintaining hemodynamic stability and preventing any other secondary organ injury, lowering ICP and ensuring adequate cerebral oxygenation.

In case of suicidal hanging there is minimal drop which leads to compression of neck soft tissue leading to jugular venous obstruction resulting in loss of consciousness. This leads to loss of muscle tone allowing for further tightening of ligature around the neck and subsequent carotid artery obstruction with or without airway closure<sup>12, 13, 14</sup>, whereas in judicial hanging body drops from a height equal to or more than persons height which causes forced hyperextension of head with cervical spine fracture and spinal cord injury leading to death<sup>12, 13</sup>. Spinal injury although uncommon, but occurs in near hanging<sup>15</sup>. Occurrence of cervical spine fracture is influenced by age, suspension time, drop from a height<sup>12, 16, 17</sup>. None of our cases had cervical injury and was ruled out by CT imaging after initial stabilisation of patients.

Regarding prognostic markers some study group concluded that a SBP <90, GCS <8 and hypoxic injury in CT brain predicted a poor prognosis<sup>12</sup> while other groups highlighted profoundly depressed GCS or cardio pulmonary arrest as poor prognostic markers. In our patients 2 had profoundly depressed GCS of which one had hypoxic injuries in MRI and in other patient outcome was good. The other 2 patients with borderline GCS improved well. Other prognostic markers long hanging

time<sup>18</sup> and drop height >body height<sup>19</sup> could not be assessed in our cases. Regarding respiratory complication none of the patient showed any finding of aspiration though it is one common complication, where as one patient developed Post Obstructive Pulmonary Edema and was managed by positive pressure ventilation with diuretics and judicious use of IVF and could be discharged of hospital by 6<sup>th</sup> day. None of the patient had retinal bleed. Only one patient had seizure( who showed hypoxic damage in CT brain). There is high incidence of both the above complication, but of little prognostic value.

**FOCUS ON:** In our case management was aimed at

- Stabilisation of neck and radiological clearance.
- Securing airway with endotracheal tube and positive pressure ventilation.
- Judicious use of IVF to maintain hydration and to avoid overload.
- Control of ICP and cerebral edema.
- Prevention and management of respiratory complications.
- Other supportive measure like DVT prophylaxis, ulcer prophylaxis and good sugar control.

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