ANIL AGGRAWAL'S
Internet Journal of Forensic Medicine and Toxicology
The world's first online journal devoted entirely to forensic medicine and toxicology · Published 1 January and 1 July

VOL. 10, NO. 1 · JANUARY – JUNE 2009
Downloaded from www.anilaggrawal.com · ISSN 0972-8074 (Online) · https://www.anilaggrawal.com/ij/vol_010_no_001/papers/paper002.html

Late death in a case of hanging - A Case Report

D.R.Vaghela, Pratik R.Patel

Assistant Professor, Forensic Medicine dept., Smt NHL Mun Medical College, Ahmedabad, India
Professor & Head, Forensic Medicine dept., Smt NHL Mun Medical College, Ahmedabad, India
Contact: the corresponding author D.R.Vaghela · digraj_gemin@yahoo.com

CITE THIS ARTICLE

Vaghela DR, Patel PR. Late death in a case of hanging - A Case Report. *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology* [serial online], 2009; Vol. 10, No. 1 (January – June 2009): [about 5 p]. Available from: https://www.anilaggrawal.com/ij/vol_010_no_001/papers/paper002.html

ABSTRACT

We present a case of hanging, in which death occurred after one month. A person had committed suicidal attempt by hanging himself at home. He was saved at that time and was referred to general hospital and treated accordingly. At the end of 36 days, person died due to irreversible brain damage and respiratory arrest. This case is reported for its rarity, for the awareness of the possible late cause of death, to explain the circumstances of such a possibility, and to emphasize the importance of involving forensic medicine experts as a part of post mortem examination.

Keywords: Late death, delayed death, hanging, asphyxia

Introduction

In unnatural deaths, the appropriate and rational interpretation and differentiation of cause and manner of death must be understood to reach at a proper conclusion. This is especially true in cases of late deaths, where more certainty is required for giving the precise cause of death. *Prinsloo* and *Gordon, Sapiro*[1] and *Meritz* described late causes of death in hanging a few decades ago and *Narayan Reddy*[2] has thrown some light on the same. Since then, as far as the cause of death is concerned, no more changes have been found. However because of increased facility and advancement in medical science, mode of death could be understood more properly . Usually, death in case of hanging occurs within a few minutes either by vagal inhibition, asphyxia or cerebral ischemia. In judicial hanging & hanging exercised with a long drop, injury to spinal cord at c2-c4 level leads to immediate unconsciousness but heart action and respiration may remains continue for up to 10 to 15 minutes.[3 , 4 , 5] Late death in hanging, as late as a month is very rare.

Case report

A 32 year old male patient attempted hanging at his home on May 11th 2007 at around 0300 pm. He was retrieved by his family members in time and was brought to the hospital. There was history of episodic convulsions. There was bleeding from the nose and mouth and loss of consciousness.

At first the patient was treated at a nearby hospital. Before having been brought to the hospital, that patient had had some episodes of convulsions suggesting 2nd degree brain insult. He was treated conservatively and was kept on mechanical ventilator for 3 days. When he was brought to the general hospital, he was unable to breath spontaneously. Emergency tracheostomy was performed and cervical collar was applied for any probable cervical injury. Blood reports and gas analyses reports were suggestive of hyperglycemia (190mg %) and type 1 respiratory failure (PCO_2 61.3, PO_2 31.2). It was decided to keep the patient on mechanical ventilation with regular oral and tracheostomy suction. Patient did not show any improvement in consciousness level, responding only to painful stimuli. Patient was diagnosed to be having permanent cerebral damage clinically on the basis of decreased power and tone of all 4 limbs and remained comatose for 12 days.

After 12 days the patient showed a little improvement in spontaneous breathing (12/min) while chest physiotherapy was prescribed. After 3 days waterbed was advised and bedsores were treated conservatively. Patient was stable, showed partial limb movements on stimuli and advised for gradual ventilation weaning. On June 2nd, patient's condition was quite good and followed verbal commands and mechanical ventilator support was taken away. On June 4th, respiratory condition worsened with bilateral shattered wheeze and the patient went into *coma vigil* . He was put on mechanical ventilation. On June 9th, patient was better on mechanical ventilation, and was advised weaning on 11th June. On 14th June, patient was better and advised tracheostomy closure. On June 15th, patient suddenly went into gasping and died while being transferred for mechanical ventilation in another ward.

Post-mortem examination

On examination of the dead body, tracheostomy wound in mid front of neck and injection marks on both forearms were evident and seemed therapeutic in nature. Old partially healed scar with brownish scab at places, of ligature mark was evident, suggestive of typical hanging. Brain showed small areas of necrotic tissues with edema and congestion. This has been described in deaths due to hanging.[6] Both lungs were congested with consolidation over both posterior lower lobes. On microscopic examination of lungs, alveolar spaces were found to contain plenty of edema fluid, macrophages, debris, denatured alveolar epithelium and inflammatory cells along with heart failure cells, was evident. All these findings were suggestive of infection or chronic passive congestion followed by pulmonary edema.[7]

Discussion

Hypoxic brain injury or global cerebral ischemia occurs due to reduced cerebral blood flow (CBF) over the entire brain. Cardiac arrest from ventricular fibrillation or asystole that lasts for 5 to 10 minutes may lead to reduced CBF resulting in specific pattern of histological injury to neurons. Though perfusion might improve later, it can still lead to secondary injury from neutrophilic influx, increased super oxygen species, cerebral edema, and hemorrhage. Irreversible cerebral infarction and death may follow.[8]

Every forensic expert must familiarize himself with recent trend towards denoting cause of death. Because of increased awareness in patients, relatives and insurance companies, it creates many problems if cause of death is not given properly. Together with this, W.H.O. guideline for expressing cause of death must be followed.

In our case, there might be multiple causes of death as differential diagnoses as death occured as late as after a month.

• There might be thromboembolism due to prolong bed-ridden state (DVT), but no primary thrombi found in major leg veins or any emboli in coronaries or pulmonary.

• Septicemia might be cause of death as patient was bed-ridden and had multiple bedsores in sacral region and other bony prominences. These primary foci may lead to generalize septicemia in already immunocompromised patient, but there was no history of high-grade fever, malaise, body ache, headache or shivering.[9]

• There was no history of neck rigidity, fever, abnormal limb movements or verbal assault suggestive of meningitis or encephalitis.

• Urea, creatinine and sugar with routine/microbiological urine reports were within normal range suggestive of no renal failure and histological examination of kidney reveled no renal pathology.

• Ion (Na, Cl, K) balance and acid-base balance was within normal range suggestive of no imbalance leading to death.

At the time of hanging, oxygen supply is decreased to brain because of pressure on carotid, severe enough to damage brain cells. This hypoxia ultimately leads to encephalopathy. Necrosis of brain cells leads to inflammatory reactions, which ultimately causes swelling and edema.[7] Brain edema together with postural lung congestion and infection leads to respiratory failure.[9]

In this case, type 1 respiratory failure was evident since admission, but then patient was improved on mechanical ventilator.

References

1. I. Gordon, H. A. Sapiro and S. D. Berson, Forensic Medicine- A guide to principles, 3rd edition, Churchill Livingstone, Edinburgh London Melbourne and New York 1988. p 95-127.
2. K S N Reddy, The Essentials of Forensic Medicine and Toxicology, 22nd edition, Hyderabad 1998. p286-320
3. Krishan Vij - Textbook of Forensic Medicine and Toxicology principles and practice, 3rd edition, 2005, p 165-221.
4. Kumar V. Hanging without knot in the noose. J Forensic Leg Med . 2007 Jan;14(1):35-8.
5. R Basu, Fundamentals of Forensic Medicine and Toxicology, p 173-194
6. A. Nandy, Principles of Forensic Medicine, 2nd edition, Calcutta, 2003. p 315-343
7. Matthew P Frosch, Douglas C Anthony & Umberto De Girolami, Robbins and Cotran Pathologic Basis of Disease, 7th edition 2004. p1347-1419
8. Harukuni I, Bhardwaj A. Mechanisms of brain injury after global cerebral ischemia. Neurol Clin. 2006 Feb;24(1):1-21.
9. Modi's Medical Jurisprudence and Toxicology edited by K. Mathiharan and Amrit Patnaik, 23rd edition, Butterworths India, New Delhi 2005.p 565-614.