



Pathology Biology Section – 2006

G20 Agonal Sequences in a Filmed Suicidal Hanging: Analysis of Respiratory and Movement Responses to Asphyxia by Hanging

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After attending this presentation, attendees will gain a better understanding of the physiological responses of asphyxia by hanging.

This presentation will impact the forensic community and/or humanity by demonstrating a unique case that will allow a better understanding of the respiratory and movement responses of asphyxia by hanging.

The goal of this presentation is to first review the literature of physiological responses to asphyxia by hanging in humans and animals, and to compare such data to a unique case of suicide by hanging that was recorded by a video-camera.

There is just one report in the literature of an analysis of agonal movement sequences in hanging, published in 1989 in German. In this case, a man recorded his autoerotic hanging with a video camera and died accidentally. Except for this foreign language case, there is very few data on human hanging. A few experimental studies have been conducted on dogs, but the application of those results to human hanging is limited. Of course, there are witnessed reports of judicial execution hangings, but those are very different in nature from typical hanging, since death is caused mostly by fracture-dislocation of the upper cervical vertebrae with transaction of the spinal cord, rather than asphyxia by neck structure compression.

A case of a 37-year-old man who filmed his hanging suicide is presented. The man tied a padded rope to his neck and fixed the other end on the rail system of an electric garage door. He used the remote control to close the door, therefore hanging himself. His feet were fixed in ski boots, tied with chains to a metal platform. A camera was previously set to film his suicide. This film allows a unique analysis of agonal movement sequences.

Before the final hanging, the man first hesitated for 23 seconds, testing the door by moving it up and down with the remote control. Then, he finally closed the door and hanged himself.

Considering the time of hanging to be time 0, the agonal sequences consisted of the following: loss of consciousness (thirteen seconds), convulsions (fifteen seconds), decortication rigidity (twenty-one seconds), decerebration rigidity (forty-six seconds), second decortication rigidity (one minute eleven seconds), loss of muscle tone with a few isolated muscle movements (one minute thirty-eight seconds) and last isolated muscle movement (four minutes ten seconds).

Twenty-one seconds after hanging, the body presented decortication rigidity, with extension of trunk and lower limbs combined with upper-limb flexion. This pattern of rigidity is caused by cerebral cortex impairment. Twenty-five seconds later, the body suddenly moved from this pattern of rigidity to decerebrate rigidity, with full extension of both upper and lower limbs. Mesencephalon impairment causes this rigidity pattern and is generally accompanied by irreversible coma and unstable vital signs.

The amplitude of movement during the initial convulsions, as well as during the rigidity pattern changes, explains the minor traumatic lesions often seen in hanging in closed areas, such as a wardrobe.

The hanging in the present case does not seem to completely occlude the airway and respiratory movements are well seen in the film. Twentyseconds after the hanging, very deep respiratory attempts with rhythmic respiratory chest and abdominal muscle contraction started. The respiration was loud and wheezing. At one minute eleven seconds, abundant saliva freely flowed from the mouth. Respiratory movements progressively decreased and completely stopped at two minutes.

This case confirmed the well-known occurrence of rapid loss of consciousness within seconds. Moreover, it gives a unique opportunity to study the agonal movement sequences in hanging.

Asphyxia, Hanging, Forensic Pathology