Hanging & its Medicolegal Importance

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ABSTRACT

The asphyxia in legal aspect can be caused by a number of events i.e. hanging, strangulation, suffocation, smothering, choking, electricity shock, etc. Hanging is a form of ligature strangulation in which the force applied to the neck is derived from a gravitational drag of the weight of the body or part of the body. Various mechanism involved in death due to compression of neck in cases of hanging are asphyxia, venous congestion, combined asphyxia and venous congestion, cerebral anaemia

Keywords: Hanging, anaemia.

No: of References: 05

INTRODUCTION

Asphyxia" is a term derived from Greek that literally translates as "stopping of the pulse." This term refers to a multi-etiologic set of conditions in which there is inadequate delivery, uptake and/or utilization of oxygen by the body's tissues/cells, often accompanied by carbon dioxide retention.

The asphyxia in legal aspect can be caused by a number of events i.e. hanging, strangulation, suffocation, smothering, choking, electricity shock, etc. Hanging is one of the common methods of committing suicide and it is considered suicidal unless contrary is proved.[1]

Strangulation, the deliberate squeezing of the neck, can cut off oxygen to the brain, drowning, where the air in the lungs is replaced by water. The airway can also be blocked when a victim chokes on an object such as a small toy or piece of food. Finally, the airway can also be physically be blocked by hanging, when a person is suspended in the air by a rope or other object wrapped around their throat. Asphyxiation from hanging can occur quickly if the trachea is compressed, or can occur as a result of strangulation if the carotid arteries are compressed.

PATHOPHYSIOLOGY: Various mechanism involved in death due to compression of neck in cases of hanging are asphyxia, venous congestion, combined asphyxia and venous congestion, cerebral anaemia, reflex vagal inhibition and fracture or dislocation of the cervical vertebra.[2] Blockage or compression of air passages is not necessary to cause death in hanging.[3]

ASPHYXIA: The constricting force of the ligature, causes compressive narrowing of laryngeal and tracheal lumina, and forces up the root of the tongue against the posterior wall of the pharynx, and folds the epiglottis over the entrance of the larynx to block the airway. Atension of 15 kg on ligature blocks the trachea.

VENOUS CONGESTION: The jugular veins are blocked by the compression of the ligature which results in stoppage of the cerebral circulation, and a rapid rise in venous pressure in the head. This occurs if ligature is made up of broad and soft material, which cannot sink into tissue to any depth. The jugular veins are closed by a tension in the rope of 2kg.

CEREBRAL ANAEMIA: Pressure on the large arteries on the neck produces cerebral anaemia and immediate coma. This occurs with ligature made of thin cord, which sinks deeply into tissues. A tension of 4 to 5kg on ligature blocks carotid arteries, and 20 kg the vertebral arteries.

Reflex vagal inhibition form pressure on the vagal sheath or carotid bodies.

FRACTURE OR DISLOCATION OF THE CERVICAL VERTEBRAE: In the absence of classical signs of asphyxia, even in hangings in which there is complete suspension, the inference must be that death has occurred more rapidly than it

takes for such signs to appear, raising the possibility that carotid sinus pressure and neurogenic cardiac arrest has played an important role.[4]

RESTRICTION OF BLOOD FLOW: Restriction of blood flow from and to the brain is typically the major feature in non-judicial hanging or strangulation. There is a significant difference in the amount of force required to occlude the adult airway and cervical blood vessels. Compression of the neck blood vessels is sufficient to cause unconsciousness and death. Thus, unconsciousness and death may occur without significant compromise of the airway.

Ligature mark in the neck is the principal external sign in hanging that requires ver meticulous inspection. In this study single ligature mark has been found in 511(89.02%) cases followed by double ligature mark 17(2.96%) and very faint 31(5.40%). The mark was oblique in 509(88.68%) cases and transverse in 50(8.71%). In this study the ligature mark was continuous in 50(8.71%) and non continuous 478(83.27%) study subjects. Impression corresponding to ligature material found in 126(21.95%) cases. The ligature mark was completely absent in 15(2.62%) cases. Any intervening object like beard, hair, neck tie, clothings if get tangles between neck and ligature material will not produce any marks on neck. Again soft broad ligature material like scarf, towel, produces faint marks. If someone is rescued soon after hanging the ligature mark may be absent1.

In this study 520(90.59%) cases had ligature above thyroid cartilage level, 28(4.88%) had marks at thyroid cartilage level and 11(1.92%) had marks below thyroid cartilage level. This coincides with a study done by Reddy KSN,which showed that in 80% cases ligature marks situated above thyroid cartilage level between chin and and larynx, in 15% cases at the level of thyroid cartilage and in 5% cases below the cartilage.1Considering injury to neck structures stretching and elongation of neck was found in 448(78.04%) cases. In hanging the neck is always stretched due to elasticity of neck muscles and vessels unless the body is removed soon after hanging. Haemorrhage in underlying layers of neck skin had been found in 372(64.81%) cases, haemorrhage in strap muscles were seen in 162(28.22%), rupture of platysma and sternocledo mastoid muscles in 66(11.49%) cases. Haemorrhage occurs due to direct trauma prodecud by ligature material and ruptured muscles indicates considerable violence, specially in long drop. Reddy in his study stated that haemorhhage may be persent in 25% cases and rupture of muscles in 5- 10% cases, which coincides withour study.1Transverse split of carotid artery intima with extravasation of blood were found in 27(4.70%) cases and rupture of vertebral arteries with intimal tear and sub intimal haemorrhage in 15(2.62%) cases. These also occurs due to stretching and crushing of blood vessels in long drop and prolonged hanging. Fracture of thyroid cartilage seen in 2(0.35%) cases with petechial haemorrhage in epiglottis, larynx, trachea in 16(2.78%), congestion of trachea in 568(98.95%) and fracture of

hyoid bones in 81(14.11%) cases. Reddy(2004) stated fracture in 10-20% cases, Nikolic S(2003) showed fracture in 68%cases, ApurvaNandy(2000) showed in 5-10% cases, Betz P(1996) showed in 67% cases, Wintraub(1961) found fracture in 27% cases and Reutor(1901) stated in 60% cases. But
Modi(1988) stated that fracture of hyoid bones are rare. Whereas Smith and Foddes(1955) and Mukherjee JB(1994) had never found any fracture in their study

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