

## Homicides due to positional asphyxia: two case reports

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**Abstract:** Homicides by positional asphyxia do not come up very often within forensic literature in contrast to other ways of asphyxia have been frequently described. This article describes two cases in which the autopsy findings of the external and internal examination, may suggest patterns for future studies and/or reference points for studying this kind of death. In addition, it could open discussion about an unfrequented topic in forensics.

The analysis of this case report aims to understand positional asphyxia as a homicide method in order to shed light on such a complex and rare kind of death.

**Key Words:** positional asphyxia, physical restraint, homicide.

Positional asphyxia is caused by the adoption of particular positions contrary to the normal posture of the body, assumed independently or induced by other circumstance, which impedes the mechanics of pulmonary ventilation (reduction of the total lung volume, functional residual capacity and pulmonary expansion). The deleterious effects of these positions interfere not only in those aspects related to breathing, but also directly with the brain and coronary circulation. The situation has been well discussed in forensic literature but only in relation to accidents (including motor vehicle accidents) under the influence of pre-existing illnesses, ingestion of alcohol or narcotic drugs [1- 9].

The following criteria are proposed by Bell, Swann and Padosch [4, 10-11] which are useful for defining the diagnosis of death due to accidental positional asphyxia:

*The body position must obstruct normal gas exchange;*

*It must be impossible to move to another position;*

*It must be excluded, other causes of natural or violent death.*

Homicides due to positional asphyxia are not very frequent, and reports within literature have been focused generally on accidental deaths due to positional asphyxia as during arrests (restriction) where accidentally if either the arrested person had cocaine intoxication or the Hog tie position induced death, as well as subjects who fall into confined spaces and are unable to get out, as traffic and work accidents [5, 11-15].

The following two cases, occurring five years ago, whose autopsy were performed at National Institute of Legal Medicine and Forensic Sciences Medellin-Colombia, pretend to open a discussion on the main pathophysiologic and diagnostic aspects of positional asphyxia as a homicide manner of death.

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### CASE REPORT 1

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A 29-year-old man, initially admitted as unidentified body (during the autopsy was found a driver's license), wearing brand name clothes in good condition, was found in a public area of a poor

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neighbourhood in the city of Medellin-Colombia within some fibre bulks. The body was bent in the following way: head, chest and abdomen were over the thighs with transparent polypropylene tape tied around knees and the chest, and the head against the limbs with the hands tied backwards with the same tape (Fig. 1).



**Figure 1.** The body of the victim as discovered at the moment of autopsy.

**CASE REPORT 2**

A 31-year-old man, unidentified even after the autopsy, with expensive clothes just like the other described before, was found in a public area of a popular neighbourhood of the city of Medellin-Colombia within blankets. The body was found bent in the following way: head, chest and abdomen were over the thighs and knees, tied with transparent polypropylene tape under the thighs and knees with the head pulled against the interior limbs and with the hands tied backwards with the same tape (Fig. 2).

External examination revealed, in both cases, localized hypostasis to the face, neck, and upper chest, with petechiae on these areas and, bilaterally, of the conjunctiva. Peribuccal cyanosis and slight abrasion in lips which did not reach the buccal mucosa or the



**Figure 2.** The body of the victim as discovered at the moment of autopsy.

frenums. Face and upper extremities were swelling. Pressure stretch marks with ecchymosis around the wrists and ankles. Case 2 additionally revealed vomit in clothes (case 1 has empty stomach), contusions on left scapula and irregular edge wounds on dorsal medium index finger of the left hand.

During the autopsy, internal examination revealed, in both cases, blood congestion at the base of the tongue, epiglottis and trachea. The third distal region of the tongue was severed, having been bitten off. Haemorrhagic infiltration in the chest and neck muscles from both clavicles to the sixth costal bilateral arches (chest in vest shape). Slight haemorrhagic infiltration around the pressure marks. Examination of the meninges and brain showed dark fluid blood in the superior longitudinal venous cavity, congested leptomeninges, flattening of the cerebral convolutions and surface sulcus, the lungs were heavy (1010 g and 1160 g, respectively) and dark red, and when incised, a frothy reddish liquid appeared. In case 2, special incisions performed (such as cervical exploration, face lifting, dorsal and gluteal incisions) showed: hematoma in right periorbital area, hematoma (9 x 4 x 2 cm long) in right trapezius muscle, non-displaced fractures of IV, V and VI anterior right ribs and lacerations of right hepatic lobe with peritoneal bleeding of 250 mL.

No microscopic studies were performed in samples collected in cases 1 and 2, because the reports in the literature indicate all asphyxia cases share common findings: cerebral and pulmonary edema, vascular congestion and generalized visceral congestion and the heart was normal for all aspects, including its coronaries arteries, valves and great blood vessels [8-10, 12].

In case 1, a sample of blood was sent to the toxicology laboratory for analysis and found to contain ethanol in a concentration of 128 mg/100 mL, cocaine and cannabinoids urine tests were found positive (qualitative). Toxicology results were negative for cocaine, alcohol, opiates, marihuana and methamphetamine in case 2.

The cause and manner of death was, in both cases, homicide due to positional asphyxia.



**Figure 3.** Note congestive anterior chest wall as a vest.

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## DISCUSSION

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For more than 100 years, the diagnosis of asphyxiation has been based in the classical signs described in many forensic medicine texts, especially by German authors [12]. However, the signs of asphyxiation may be present in some external causes of death, including natural death. Therefore, unless there is evidence of the cause of asphyxia, its diagnosis is without any value.

Respiration in healthy subjects compromises two important factors: movements of the ribs through the intercostals muscles and movement of the diaphragm. The ribs expand and the diaphragm is contracted taking air to the lungs (inhalation); the ribs and the diaphragm relax, later expelling the air out of the lungs (exhalation). When an individual is subject to restrictions on these movements compromising the ability to breathe, then it is not possible to expand the thoracic cage and the abdominal organs are compressed thereby reducing movement to the diaphragm which worsens the situation even more.

Posture asphyxia is a fatal condition which appears due to the adoption of a body position that interferes with breathing mechanisms, which may take place in several circumstances (work accidents, traffic accidents, torture, kidnapping, etc.). Its diagnosis is difficult due to the nonspecific signs presented (common to all anoxia). However, its main difference lies in the way of the event took place, for instance, it may be a position adopted for pleasure or forced by another [5, 7, 9].

There are a number of potential adverse effects related to the application of restriction to the thoracic cage in a person. These include incapacity to breathe, sensation of sickness or vomit, face and neck edema, and the appearance of petechiae in the face, neck and chest. If the restriction continues, the situation gets worse and is generalized which compromises the functioning of the internal organs. All muscles of the body require oxygen for their functioning, including the heart. When the heart fails to receive the adequate amount of oxygen, it starts to beat harder, trying to achieve the optimum levels of oxygenation. If this is not possible, arrhythmias are generated which may threaten life itself. The venous circulation starts to suffer restrictions, and floods the tissues producing venous congestion and capillary rupture [5].

Therefore the correlation of autopsy findings, location of the bodies and the context, Medellin city, Colombia, has been known for its large violence history from 80's decade when narcotics dealers began to develop a terror between them so called Cartel wars until nowadays. Since then, several techniques and terror mechanisms to kill have been designed, neighbourhoods with the presence or influence of street gangs or organized

crime, are much relevant to define the cause of death.

The findings described in autopsy correspond to a homicide and/or torture method, where the absence of strangulation signs and foreign objects damage in the upper respiratory tract, moreover the presence of marked congestion of the chest muscles in the shape of a vest allow us to make this kind of diagnosis (Fig. 3).

This is because the positioning of the body interferes with respiration mechanics. On this subject, literature has mentioned the Incaprettamento, a particular way of homicidal positional asphyxia which has been reported as a method applied by the Italian Mafia. It consists of knotting one end of the cord around the neck and the other end of the cord around the ankles which pulled backwards, with the hands being tied towards the posterior part of the chest. The person may avoid chest constriction, and therefore asphyxiation while he can sustain flexing his legs towards back, but once fatigue sets in due to the force position, the individual dies strangulated. In a serie of 18 autopsies, it was possible to arrive at the conclusion that the Incaprettamento was simply to enable easier packaging and transportation of the body to another place [1, 16].

The presence of vital reactions in one of these cases, such as vomit must be considered to discard the possibility that the body position was not intended to facilitate the packaging and transportation of a corpse from the place of the event [4, 16].

Other signs founded as the slight to moderate skin, bone and organ system injuries must raise the idea of possible torture [16].

The tied hands or the hands behind the back, is a factor which worsens respiration and which must be considered when analyzing the physiopathology of positional asphyxia as a way of homicidal death and the presence of haemorrhagic infiltration in the chest muscles is an important indication of asphyxia [5].

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## CONCLUSION

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The medical legal autopsy with special incisions and toxicological study allowed us to perform an accurate diagnosis regarding the causes and manner of death.

This kind of homicidal method may be an element of crimes against humanity, war crimes and other forms of violations of human rights. They may be perpetrated to admonish or warn members of specific cultural groups (including criminal groups and the so called Mafia). In some circumstances, dead bodies may be mutilated or displayed in public spaces and this could interfere with the analysis of the specific cause and manner of death.

From these cases, the authors conclude that further research is necessary in order to understand how this kind of asphyxia results in such a complex method of death.



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