



Pathology/Biology Section - 2015

H72 Lethal Drug Intoxication of a Bank Robber: The Role of Physical Restraint

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The goal of this presentation is to discuss controversies that often arise concerning deaths that occur under physical restraint, with disputes due to increasing public concern on the recourse of violence by police officers and to the byzantine definitions of self-defense among countries' legal frameworks.

This presentation will impact the forensic science community by stressing the prominent role of a thorough synopsis of the results from testimony, scene inspection, and a complete autopsy – with radiological and toxicological analysis – when dealing with deaths that occur during physical restraint.

Choke holds, also known as “*shime waza*” in the sport of judo, are widely used by police officers to subdue violent suspects. It was once believed to be a safe and harmless way of controlling and subduing violent suspects; however, recently, multiple case reports and reviews have emphasized the possible lethal effect of neck compression during physical restraint.

Conversely, cocaine is a major cause (36%) among undetermined deaths occurring during physical restraint or custody. Cocaine is a powerful sympathomimetic agent; its role in the sympathetic sensitization of the myocardium has been widely discussed. Cocaine increases myocardial inotropy, heart rate, and blood pressure in a dose-dependent manner, thus increasing myocardial oxygen demand.

Some case series report deaths that occurred during choke holds on subjects whose blood samples were positive for cocaine; however, in these reports, cocaine blood levels are not quantified.

A case of an attempted bank robbery is presented. The perpetrator came into the bank wearing a baseball cap and sunglasses holding an electronic device, claiming it was a bomb. One of the bank clerks and a customer immediately realized that the electronic device was a power transformer and attempted to push the robber outside the bank. During the struggle, the robber pulled a screwdriver out of his pocket; he was tripped and pulled down. The robber was then immobilized on the floor, in prone posture, with the bank clerk pressing the assailant's thorax and an arm locking the neck, while the bank customer was blocking the robber's arms. The immobilization lasted approximately five minutes, per witness testimony. During this period, the robber's behavior escalated; he was agitated, shouting blasphemies, threatening bystanders, and suddenly showed disorganized and inconsistent thought processes and disturbances in speech. When police officers arrived at the scene, the robber was quiet. He was then handcuffed, but while moving him in a supine posture, the robber's face was described as cyanotic. Resuscitation attempts were then started but proved to be ineffective.

Scene inspection revealed bloody fluid on the ground, arising from the mouth and nostrils. Rectal temperature, measured two hours after death, was slightly increased from that expected. Conjunctival petechiae, mouth ulcers, and a small abrasion on the nose were found at external examination, with minor bruises on the arms and legs.

At autopsy, a meticulous dissection of the neck was performed, since choke holding of the robber's neck was reported by witnesses. Minor hemorrhagic infiltration of the soft tissue surrounding the left lesser horn of the hyoid bone was identified, without any fractures. A computed tomography scan with 3D reconstruction confirmed the macroscopic examination results. The lungs were congested and edematous, with foamy fluid in the airways. Heart dissection showed plaques on the right coronary artery (30%) and circumflex artery (50%). Histology revealed contraction bands in the myocardium.

Toxicological analysis was performed on blood, urine, and vitreous humor; gas chromatography/mass spectrometry assessed lethal blood levels of cocaine, benzoylecgonine, ecgonine-methyl-ester, and cocaethylene. Urine and vitreous humor were negative. Cocaine consumption occurred within an hour prior to the attempted bank robbery.

No evidence was found of significant trauma or a natural pathological cause which could independently justify the death. Data resulting from witness testimony, autopsy, and ancillary postmortem analysis allowed the determination of cocaine intoxication as the cause of death; the manner was declared as accidental. The mechanism of death involved a terminal arrhythmia, most likely due to sympathetic sensitization of the myocardium by cocaine and the stressful effects of the attempted bank robbery and the subsequent struggle. It can be speculated that the pre-existing coronary artery disease played a role in the establishment of the arrhythmia and in the failure of the resuscitation attempts.

Drug Intoxication, Physical Restraint, Choke Hold

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