G122 Sudden Cardiac Death Due to Acute Coronary Artery Dissection Following Exercise-Related Blunt Chest Trauma: A Case Report

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After attending this presentation, attendees will learn about an unusual case of unexpected cardiac death during sports activities due to an acute coronary artery dissection following blunt chest trauma.

This presentation will impact the forensic science community by increasing awareness of sudden cardiac death following a blunt chest trauma occurring during sports activities.

The case is presented of a healthy 43-year-old man who suddenly collapsed ten minutes after the beginning of his sporting activity, kung fu. Despite resuscitation efforts by paramedics, the patient never regained a cardiac rhythm and expired. Review of the decedent's hospital records revealed that he had no specific past medical history. A forensic autopsy was performed 48 hours after death. At the external examination, the body showed embalming. There were also some contusions on the upper limbs, and one contusion on the left lateral chest area. Area of hemorrhage were found next to the left lateral fourth, fifth, and sixth intercostal spaces and anterior to the left second. The aortic arch and the descending aorta was normal and without coarctation. The heart weighed 410g which was within the normal reference range, and it had unremarkable myocardium and cardiac valves. The coronary arteries were present in a normal distribution with a right dominant pattern. An area of hemorrhage next to the proximal segment of the left anterior descending artery was observed. The other coronary arteries were without abnormalities. The lungs were edematous and their cut surfaces were congested. The gross examination of the left anterior descending artery showed a thick, recent adventitial hemorrhage surrounding the proximal segment with luminal obstruction by hemorrhage. Histological examination of the left anterior descending coronary artery revealed an acute dissection between the inner four-fifths and outer one-fifth of the media with collapse of the lumen due to blood in the false channel. Histologic examination revealed no evidence of inflammation, medial degeneration, or vasculitis. The arterial wall not involved by the dissection was otherwise unremarkable. An elastic stain showed essentially normal elastic fibers. In addition, the postmortem toxicological screening was negative. The death was attributed to an acute dissection of the left anterior descending artery resulting in an acute myocardial ischemia.

The heart's position between the sternum and vertebral column makes it vulnerable to injury from blunt chest trauma. Cardiac injuries after blunt chest trauma are various, including myocardial contusion or hemorrhage, arrhythmia, cardiac rupture, valvular injury, and acute myocardial infarction. Road traffic accidents are mainly responsible for blunt chest trauma and heart injury. Coronary artery dissection following blunt chest trauma is rare and is even less common in the setting of a contact sport such as kung fu. Coronary artery dissection following blunt chest trauma typically involves the left anterior descending artery; the probable explanation is its vulnerable anatomic position on the anterior part of the heart. The second most commonly affected artery is the right coronary artery. Although rare, left circumflex coronary artery involvement has also been reported. Shearing forces during the traumatic episode probably cause intimal tears of the most vulnerable part of the left anterior descending artery, which subsequently initiates the process of thrombus formation. Cases of coronary artery dissection have been described after practicing rugby, soccer, basketball and water-skiing. It is assumed that this is the first report of acute coronary artery dissection leading to sudden death following the practice of martial arts. The martial arts are considered relatively safe compared to many other sports, including football, basketball, and wrestling, and most martial arts injuries reported in the literature are minor. Indeed, the most common types of martial arts injury are sprains, strains, and contusions, and the less common injuries include fractures, dislocations, and dental injuries.

In conclusion, the forensic pathologist may be aware of the possibility of sudden cardiac death in a context of martial arts practice, and that martial arts are mistakenly considered safer than most.

Coronary Dissection, Sports, Blunt Chest Trauma

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