G101 Traumatic Renal Artery Rupture Following a Fall: A Fatal Occupational Accident

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After attending this presentation, attendees will understand the importance of full forensic investigations in establishing the manner of death in occupational deaths. Circumstantial data and autopsy findings, together with a detailed workplace investigation, also are fundamental for the identification of legal responsibilities.

This presentation will impact the forensic science community by emphasizing the fact that, in some circumstances, the forensics have to take into account the traumatic involvement of vascular structures, even without external major injuries. From this perspective, the autopsy is crucial, mainly if death occurred at the time of the accident or immediately after and other causes (natural death, drug or alcohol abuse) must be evaluated.

Presented is a case of an occupational death due to rupture of the left renal artery in closed thoracic-abdominal trauma, after a fall from a height. Blunt renal artery injury is a relatively rare finding. The literature demonstrates an incidence of 0.08% of all blunt abdominal traumas, occurring in 1% to 4% of patients with renal injury. The most common cause is motor vehicle accidents; other causes include a direct blow to the chest or abdomen and a fall from a height. All of these mechanisms result in sudden deceleration or crush injuries, affecting the renal parenchyma or the vascular pedicle. Moreover, a traumatic ruptured renal artery, without grossly demonstrable kidney damage, is also unusual.

In the case presented, a 47-year-old man accidentally fell from a height of 2.5 meters while he was working on a scaffold. The worker was taken to the local hospital, but he remained unconsciousness and unresponsive. A rounded bruise of the left thoracic wall was noticed. At echocardiography, a hematoma was observed at the upper left abdominal quadrant. The patient was intubated and, despite the cardio-pulmonary resuscitation, he died 30 minutes later. With the goal of better understanding the dynamics of the event, a medicolegal autopsy and crime scene investigation was performed.

The shirt he wore showed a soft rounded mark on the left side of the chest. The external examination of the body showed only a rounded bruise of seven centimeters in diameter on the left hypochondrium. At autopsy, fractures of eight ribs were found (the majority to the left), with perilesional hemorrhages with nearly 100cc of fresh blood in pleural cavities. The abdominal cavity displayed two litres of fresh blood and clots. A complete rupture of the left renal artery was found at one centimeter from the origin from the abdominal aorta. No alcohol or drugs of abuse were found in the fluids collected at autopsy. The cause of death was identified as hemorrhagic shock due to the laceration of the left renal artery.

Frames of the surveillance cameras were acquired, showing the man sliding off the scaffold (made of metallic beams and wooden traverses) and falling on the left side of the body, without displaying where he landed.

At the workplace investigation, a footprint on the external side of the scaffold was found, where the victim was working; the footprint matched shoes worn by the worker. On the grassy ground below, was a metallic pedestrian gate with a 1-meter-high hinge post placed just below the side of the scaffold, 2.52 meters from the footprint. The final reconstruction of the fatal accident concluded the man had fallen onto the gate hinge post, hitting the left side of the thorax; the blunt injury caused the rib fractures and the laceration of the left renal artery without any other injury of internal organs.

This report of isolated renal artery rupture represents an unusual finding, extremely rare following blunt abdominal trauma, and accounts for less than 0.1% of all trauma patients. Moreover, traumatic renovascular injuries occur most often in multiple injury patients. In the presented case, the preliminary reconstruction of the work-related fatality was not clear before the autopsy as there were no major external lesions. Therefore, the autopsy detected the cause of the death, allowing the real traumatic mechanism to be traced.

Traumatic Artery, Occupational Fatality, Workplace Investigation

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