

THE AMERICAN ACADEMY OF FORENSIC SCIENCES

PROCEEDINGS

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MODERN FORENSIC SCIENCE WORLD



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H4 A Fuel Tank Injury In a Fatal Motorcycle Accident

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Learning Overview: After attending this presentation, attendees will better understand that some typical lesions can help the forensic pathologist to clarify the dynamics of motorcycle accidents.

Impact Statement: This presentation will impact the forensic scientific community by highlighting the importance of injury around the groin area in victims of motorcycle accidents, known as Fuel Tank Injury (FTI) as one of the few characteristic findings.

Vehicle trauma is the leading cause of death in young people. The collision injury mechanism is the cause of direct impact with a fixed object, another motorcycle, or vehicle. FTIs occur when a motorcycle undergoes a violent deceleration following the impact, leading the driver to slide forward against the tank, handlebars, and steering of the vehicle. The driver creates high peak loads between the rider's pelvis and the motorcycle fuel tank, causing abdominal and groin injuries. The 85% of the pelvic injuries sustained by the patient were due to this type of mechanism.^{1,2} FTIs are comparatively rare even in drivers of motorcycle accidents because they may occur only from a head-on collision. Some reports showed that the FTI was an evidence of the driver, even though the passengers can also suffer from groin injuries.³

A 26-year-old man was riding on a motorcycle with a 600-cc engine (Honda® Hornet®). The motorcycle ran straight into an intersection at high speed and collided with the right-frontal side of a left-turning car. The rider was thrown from the motorcycle onto the roadway by the impact. He was unconscious immediately after the accident and had neither spontaneous breathing nor response on arrival at the emergency department, where he was pronounced dead.

At autopsy, the body showed purple bruising distributed symmetrically over both hips with a partial bowel evisceration through an abdominal lacerated wound, scrotal laceration with exposure of the left testicle, left femur's fracture, and diffuse bruises and abrasions of the head, the trunk, the abdomen, and the four limbs. Multiple rib fractures, thoracic aorta's laceration, intrathoracic herniation of the liver through a diaphragmatic breach, and laceration of the bowel, the spleen, and the liver were also found.

The groin injuries were related to the violent impact with sudden deceleration of the motorcycle, which catapults the rider forward over the saddle. The FTI resulted from gliding and striking of the scrotum and perineum of the rider on the fuel tank during the collision.

For its mechanism, this injury is one of the most useful and important findings of the motorcycle driver and has been described as exclusive to the driver who is sitting behind the fuel tank.³ The occurrence of groin injuries appears to be dependent on the specific dynamics of the collision and on the impact speed.⁴ Therefore, a better knowledge of the FTIs is helpful to understand the dynamics of the event and to discriminate the driver from the passenger, in case this is unknown.

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Fuel Tank Injury, Groin Injury, Motorcycle Accident