Identification of a Driver from the Analysis of Specific Injuries

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Abstract

Determining who was driving a vehicle is often an important part of the assessment of a crash because of the potentially significant medicolegal ramifications. A case is reported of a vehicle containing two occupants. The male occupant had a blood alcohol reading of 85 mg/100 ml and the female occupant (who claimed to be the driver) of 0 mg/100 ml. However, the injuries to the male were more consistent with an impact against the steering wheel and from the posterior displacement of the floor toward the driver’s seat. The injuries sustained by the female occupant were less severe and fewer in number. Blood stains on the edge of the driver’s window and the steering wheel were from the male occupant. It was concluded, therefore, that the male occupant had been the driver and not the female occupant as was being claimed. This result had significant implications in terms of insurance claims and potential criminal charges.

Keywords: Accident, driver, forensic science, injuries, investigation vehicle crash

INTRODUCTION

In vehicle crashes, it is often imperative to identify the driver, particularly if criminal charges are being considered.[1] Given the potential significance of this, it is common for passengers and the driver to give the police misinformation in an attempt to prevent pinpointing the driver. There are many reasons for this including situations where the driver has been intoxicated,[2,3] or is under the influence of drugs, or has not had a current driver’s license. In the case of fatal crashes, it is also common for survivors to claim that the driver was one of the decedents. For this reason, careful interpretation of injury patterns can be vital in either confirming or refuting the proffered statements.[4,5] The following case is reported to demonstrate a situation where the analysis of injury patterns did not support witness statements. In addition, the usefulness of the examination of structural damage to the vehicle and the position of blood stains is demonstrated.

CASE REPORT

A vehicle crashed into a safety barrier at the center of a road injuring the driver and his/her passenger. The vehicle occupants were transported to a hospital before the arrival of traffic police. The blood alcohol level of the male occupant was 85 mg/100 ml, which is higher than the legal limit in China of 20 mg/100 ml. Alcohol was not detected in the female occupant who claimed that she was the driver.

Examination of the vehicle occupants

A 30-year-old male occupant had multiple injuries consisting predominantly of superficial abrasions and bruises. These were found in the left of the forehead, right upper eyelid, and the right upper lip (measuring 0.5 cm × 0.1 cm, 0.7 cm × 0.2 cm, and 3.0 cm × 1.0 cm, respectively), the front of the neck/upper part of the chest (14.0 cm × 12.0 cm), the left elbow and the middle of the right forearm (10.5 cm × 3.5 cm, 8.0 cm × 3.0 cm, and 6.0 cm × 2.5 cm), the anterior aspect of the left knee and the left popliteal fossa (3.0 cm × 1.5 cm and 5.0 cm × 4.0 cm, respectively), and the lower, and lateral aspect of the right knee (5.0 cm × 4.0 cm and 4.0 cm × 3.0 cm respectively). A sutured wound (2 cm) was located on the right lower lip near the angle of the mouth. Significantly, a large bruise (9.0 cm × 9.0 cm) was...
located on the right inner malleolus, which was accompanied by a superficial linear abrasion (scratch) and a skin flap (2.5 cm × 0.8 cm) at the center of bruise [Figure 1]. Further examinations revealed a comminuted fracture of the superior border of the left acetabulum with posterior dislocation of the head of the femur through X-ray examination and computed tomography scan [Figure 2].

A 31-year-old female occupant had multiple bruises located on the lateral aspect of the left upper arm (5.0 cm × 4.0 cm), the lateral aspect of the right leg (7.0 cm × 1.0 cm), the anterolateral aspect of the right inner ankle (3.0 cm × 0.5 cm), the anterior aspect of the left leg (5.0 cm × 0.6 cm), and the anterolateral aspect of the left ankle (6.0 cm × 2.0 cm). A 3-cm-length sutured wound was located on her left lower jaw, and there was conjunctival congestion of her left eye. Neither occupant showed seat belt markings.

Examination of the vehicle
The vehicle was a standard late-model sedan. The major impact trace was located on the left side of the vehicle with a 45–62 cm-long depression that was approximately 14.5 cm in depth and 35 cm in width. There was also loss of the left portion of the bumper bar and damage to the roof. The driver’s door was severely damaged and could not be opened (the inside door handle had been broken off). The glass of the window was shattered, and the steering wheel and instrument board were also damaged and displaced downward.

The front section of the vehicle cabin on the driver’s side was displaced posteriorly, resulting in the clutch, brake, and accelerator pedals being pushed backward toward the driver’s seat. The width of the right side of the brake pedal was 0.8 cm [Figure 3]. The driver’s seat was also twisted and displaced forward. In contrast, the cabin and seat on the front-passenger side were intact.

Blood stains were located on the edge of the driver’s window, on the steering wheel, on the left side of the driver’s seat, and on the inner part of the right rear door. DNA analysis result of the blood stains collected from these sites matched with the male occupant’s DNA typing, which indicated that they were from the male occupant.

Based on these analyses, it was concluded that the male occupant had been the driver and not the female occupant as was being claimed. This clearly had significant implications in terms of insurance claims and criminal charges for driving under the influence of alcohol or drunken driving cases. Subsequently, the male occupant confessed that he had asked his wife to state that she had been the driver, as he was afraid of criminal charges related to his alcohol consumption.

Discussion
The reported case demonstrates the value of careful examination of injuries in vehicle crash victims[6,8] and correlating these with the alleged history of the incident and the physical findings in the vehicle. Clearly, these can vary greatly depending on the time that has elapsed since the crash and the mechanism of impact.[9] In the reported crash, the point of impact was on the driver’s side, with significant damage to the driver’s door and cabin. It would appear most logical, therefore, that the occupant who had sustained the most significant injuries was sitting in the driver’s seat. This was the male victim.

On examining the injuries to the male occupant, the facial, anterior neck, and chest injuries were most likely sustained
upon impact with the steering wheel which was pushed downward [Figure 4]. The comminuted fracture of the left acetabulum and posterior dislocation of the left hip would be in keeping with the longitudinal forces related to the posterior displacement of the floor toward the driver’s seat. Of note, the width of the abrasion and skin flap on the right inner malleolus matched the width of the edge of the brake pedal (0.8 cm). The injuries sustained by the female occupant were less severe and fewer in number and less specific. During the road traffic accident case investigation, the forensic expert could find out specific pattern injuries of the victim and matched the injury to the special structure of the vehicle, which would apply crucial evidences to identify the driver.

This report demonstrates the importance of carefully integrating specific physical findings (especially pattern injuries), DNA analysis, the history of a crash, and the damage to the vehicle with the statements of passengers in some road traffic accident cases.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

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