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Fatal truck-bicycle accident involving dragging for 45 km

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Abstract Vehicle-bicycle accidents with subsequent dragging of the rider over long distances are extremely rare. The case reported here is that of a 16-year-old mentally retarded bike rider who was run over by a truck whose driver failed to notice the accident. The legs of the victim became trapped by the rear axle of the trailer and the body was dragged over 45 km before being discovered under the parked truck. The autopsy revealed that the boy had died from the initial impact and not from the dragging injuries which had caused extensive mutilation. The reports of the technical expert and the forensic pathologist led the prosecutor to drop the case against the truck driver for manslaughter.

Keywords Forensic · Traffic accident · Bicycle rider · Dragging · Abrasion injuries

Introduction

Unlike roadway fatalities of pedestrians, deaths of bicycle riders are relatively rarely observed in forensic medicine. Although these accidents appear to be more common in Europe [1], in an American study only 36 out of 6,552 cases investigated involved bicycle riders and of those 72% were collisions between bikes and motor vehicles [2]. Most of these accidents occurred in urban areas with an equal distribution between men and women, at least in Europe [3]. Typical findings were fatal head injuries and fractures of the lower legs, and patterned injuries from parts of the bike occurred regularly [4]. Examples would be stamp abra-

sions of the medial lower leg produced by the bicycle crank set, the chest or abdomen by the handlebars [5], or the thighs by the edge of the seat [2].

Typically a victim of such an accident will be found near the scene of accident, although the body can be dragged by the vehicle for kilometers. Nevertheless, those cases appear to be extremely rare with only one case being found in a literature search [6], and in this case the body was dragged for 4.2 km. We present a second case in which a biker was killed in a collision with a truck and dragged for a distance of 45 km and report the extensive mutilating abrasions caused by the extremely long dragging distance.

Case report

The distribution of blood and brain tissue, the damages to the bicycle and truck, the analysis of the travel recorder and testimonies of witnesses and the truck driver allowed the following reconstruction of the accident:

A 16-year-old mentally retarded boy was riding his bike in a busy thoroughfare of the city of Graz, Austria. A number of vehicles, one of them a 16.4 m long truck, had stopped in front of a set of red traffic lights. The boy either dismounted his bike and stood in front of the truck or overtook the stationary truck to the right side. In either case the boy stood with his bike in front of the truck, approx. 1–1.5 m from the kerb, and probably in the dead vision area of the driver when the truck accelerated. The right front corner of the truck struck the rear wheel of the bike (but not the body of the victim) and the head of the boy was run over by the right rear tyre of the prime mover at a speed of approx. 10 km/h. The bike became trapped by the oil pan and the boy became trapped with his left foot in the rear axle of the trailer, approx. 13 m behind the bike. The truck, whose driver had failed to notice the accident, was driven for approx. 250 m until stopped because the driver became aware of the noise produced by the dragged bike. He removed the bike from under the truck without noticing the body of the victim. He thus assumed that he had run over a parked bike and resumed his travel to a neighboring town. After a 45 km drive he found the corpse when unloading the truck and notified the police.

On inspection of the truck by the forensic pathologist the body of the victim was found trapped with the left leg in the rear axle of the trailer. The body was in a prone position, the upper part and the right foot stretched towards the rear end. Only the left shoe and parts of the jeans were left of the clothes. The back of the corpse was not in contact with the trailer which had a clearance of more than 50 cm (Fig. 1). Bloodstains and brain particles were found in

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Fig. 1 The body of the victim of the truck-bicycle accident trapped with the left foot in the rear axle of the truck as found after a 45 km drive

the vicinity of the rear tyre of the prime mover and on the road surface at the scene of the accident.

No ethanol was found in the blood of the truck driver. An autopsy was performed to clarify the cause and manner of death and to reconstruct the accident.

Autopsy findings

The body was that of a 16-year-old boy with normal physical development. The skull was squashed and the brain was missing. Discreet bleeding was noted in the remnants of galea and brain. Extensive abrasions and friction-like injuries were noted at the anterior aspects of both arms, the face, the anterior parts of the chest, and the medial part of the right foot. These structures were literally abraded away (Figs. 2, 3, 4). The surface of the wounds was blackened and surprisingly smooth with encrusted dirt particles. The anatomical structure of the bones and soft tissues were visible, reminiscent of anatomical preparations or pictures produced by computer-assisted tomography.

Of the face only both ears and orbitae, the nose and parts of the upper jaw were remaining. The largest part of the mandible with all the teeth was abraded away as were parts of the right ribs. The

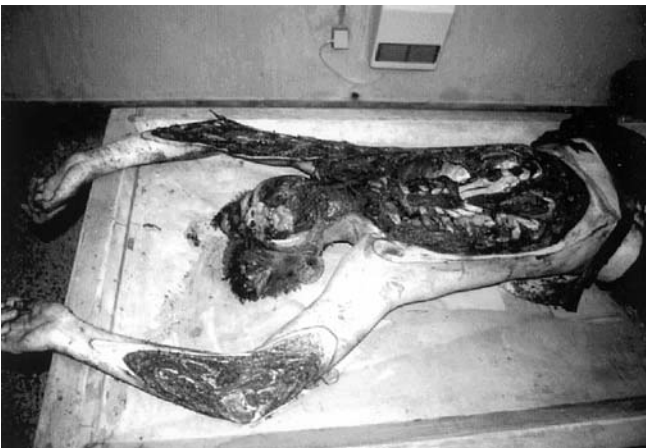


Fig. 2 The dorsal view of the body of the dragging accident victim. Massive abrasions of both arms, the face and the torso. Wide opening of the left side of the chest and the abdomen



Fig. 3 Squashed skull and massive abrasion of the lower part of the face. Abrasion of the upper arm and the proximal part of the forearm. In the elbow the bone marrow cavities of the condylus of the humerus and the olecranon of the ulna are visible



Fig. 4 Abrasion at the medial part of the right foot

foremost parts of the left ribs 3–10 were completely ground away, the left pleural cavity being opened over a 40×10 cm area. The anterior part of the diaphragm was partly missing. The liver and spleen showed loss of tissue due to abrasion (Fig. 2).

Both arms were abraded up to the bone marrow cavities of the humeri and ulnae (Fig. 3). Of the right foot most parts of the medial ankle, the first metatarsal bone and the big toe were no longer present (Fig. 4). No hemorrhages were detected in and around any of the abrasions. The back of the body was inconspicuous except for minor unspecific abrasions and hematomas. No fractures or luxations of any of the bones and joints of the extremities were noted. There were no internal injuries or natural diseases to the organs of chest and abdomen except for the deep abrasions. No ethanol was found in blood and urine of the victim.

Discussion

The present case merits attention mainly from 2 aspects: firstly vehicle-biker accidents with dragging of victims for kilometers are extremely rare. In the international literature only one such case, also involving a truck, is reported [6]. Vehicle-pedestrian accidents with dragging, on

the other hand, appear to be more common. In most of those cases [7, 8, 9, 10, 11] cars rather than trucks were involved and the victim was run over while lying on the road.

The second aspect is the extremely long distance of dragging (45 km) and the consequent massive mutilations of the corpse. In the only case reported with a biker as victim the distance was 4.2 km [6]. In the cases with pedestrians as victims the distance varied between less than 1 and 10 km [7, 8, 9, 10, 11].

In most cases patterned injuries from the exhaust or parts of the chassis, which can be helpful for reconstructing the accident, were observed. In our case, however, no significant injuries from parts of the truck (except for the injury to the skull caused by the right rear tyre) were noted. The absence of those injuries was due to the fact that the clearance of the truck was approx. 50 cm and the back of the corpse therefore did not come into contact with parts of truck or trailer. Cars, on the other hand typically have a clearance of less than 15 cm, whereas the height of a prone adult is well over 20 cm. On the other hand, also no typical bicycle-related injuries were noted.

In most of the reported cases, especially those when a lying pedestrian is run over by a car, signs of vitality like hemorrhages, dilated vessels, or aspiration of dirt particles were observed [10, 12]. In those cases thoracic compression and subsequent traumatic asphyxia, tension hemothorax or blood loss during the dragging were established as the cause of death rather than the initial impact [6, 8, 10, 11]. Only in some of those rare cases in which the victim is hit in an upright position death was found to have resulted from the initial impact injuries with the dragging injuries graded as accompanying injuries inflicted partly postmortem [12].

In the present case macroscopic signs of vitality were limited to the remnants of the skull. A proof of vitality with established histological and histochemical methods as proposed elsewhere [13, 14] was not performed as in the present case the victim was (fortunately) killed instantly by the right rear tyre of the prime mover smashing the skull and brain. This assessment was deduced from testimonies of witnesses of the accident and brain tissue particles found at the scene of the accident and in the vicinity of the rear tyre, while the corpse was found attached more than 10 m to the rear.

Our case is, however, typical for such accidents because that the victim was of impaired capability to ride in traffic: In most published cases the victims were heavily intoxicated [8], in the present case the victim was mentally retarded.

Also limited visibility is usually reported, in the present case due to the fact that the victim was standing with his bike in the dead area from the truck driver's point of view.

Typical findings in dragging deaths are also the (partial) undressing of the victim.

In the present case the truck driver stated that he had not noticed the accident but heard the noise caused by the bike being dragged over the road surface. He stated that he had looked for an injured rider, but had failed to notice the corpse attached to the rear axle. The technical expert could not refute this statement. The forensic pathologist stated in his report that the death of the boy occurred instantly and as consequence of the first impact. The dragging injuries were thus afflicted postmortem. Because of these facts the prosecutor refrained from preferring a charge for manslaughter.

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