

Road Traffic Accident, Drowning and Secondary Drowning: Case Series

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ABSTRACT

Road traffic accidents (RTAs) commonly result in deaths due to blunt force trauma; however, in certain environmental conditions, drowning can become a primary cause of mortality. We present a series of six cases following a road traffic accident where a bus plunged into a drain after colliding with a truck. Five passengers died at the scene due to drowning, while one succumbed two days later to secondary complications consistent with drowning-associated acute respiratory distress syndrome (ARDS). This report highlights the forensic features of drowning and secondary drowning and emphasises the importance of meticulous autopsy examinations in multi-causal deaths following vehicular accidents.

Keywords: Road Traffic Accidents, Drowning, Secondary Drowning.

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INTRODUCTION

Drowning as a consequence of road traffic accidents is an underrecognized cause of death. In cases where vehicles submerge into water bodies, drowning can occur either immediately or after a survival period, resulting in secondary drowning due to delayed pulmonary complications such as acute respiratory distress syndrome (ARDS).¹ Forensic pathologists must differentiate between traumatic injuries and asphyxia due to drowning, especially in complex scenarios involving both mechanisms.²

Case Series Description

Incident overview

On 18/02/2025, a fast-moving bus collided with a truck and fell into a drain. Five passengers, including a woman, died at the scene, and over 30 individuals were injured. One additional male passenger succumbed two days later while under medical care. Postmortem examinations were conducted at the Department of Forensic Medicine, GGSMCH, Faridkot, after proper identification and police procedures.

Case 1

A male aged 52 years old was brought dead on 18/02/2025 at 10:21 AM with alleged history of road traffic accident and on external examination, cyanosis over nails of both hands and blackish mud was present over nostrils and both ears and fine tenacious froth mixed with dirty water was coming out of nose and mouth. On opening of the trachea, whitish froth mixed with blackish foul-smelling mud and liquid material was present. Rib markings were present on both lungs, and

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both lungs were heavy. The cause of death was declared as asphyxia due to ante-mortem drowning.

Case 2

A male aged 63 years old was brought dead on 18/02/2025 at 10:15 AM with an alleged history of road traffic accident, and on external examination, an abraded lacerated wound was present over the forehead, reddish abrasion over the nose, all injuries were ante-mortem in origin. Blackish mud was present over both nostrils; fine, tenacious froth mixed with dirty water was coming out of the nose and mouth. On opening of the trachea, whitish froth mixed with blackish foul-smelling mud and dirty liquid was present. Both lungs were congested, voluminous and heavy and rib markings were present on the surface. The cause of death was declared as asphyxia due to ante-mortem drowning.

Case 3

A male aged 45 years was brought dead on 18/02/2025 at 10:16 AM with an alleged history of a road traffic accident,

and on external examination, a lacerated wound was present over the forehead. Injury was ante-mortem in origin. Blackish foul-smelling mud was present over the chest, both ears, and nostrils; fine tenacious whitish froth mixed with dirt and water was coming out of the nose and mouth. On opening of the trachea, whitish froth mixed with blackish foul-smelling mud with dirty liquid was present. Both lungs were congested, voluminous and heavy and rib markings were present on the surface. The cause of death was declared as asphyxia due to ante-mortem drowning.

Case 4

A female aged 35 years old was brought dead on 18/02/2025 at 10:22 AM with an alleged history of road traffic accident, and on external examination, reddish abrasion and lacerated wound were present over the forehead, reddish bruise was present over the left forearm and right leg, all the injuries were ante-mortem in origin. Crushed glass particles were present over the chest. Blackish foul-smelling mud was present in the right ear and in both nostrils, fine tenacious froth mixed with dirty water coming out of the nose and mouth, with cyanosis present over the ear lobules. On opening of the trachea, blackish mud and whitish froth mixed with dirty liquid were present. Both lungs were congested, voluminous and heavy and rib markings were present on the surface. The cause of death was declared as asphyxia due to ante-mortem drowning.

Case 5

A male aged 75 years old was brought dead on 18/02/2025 at 09:12 AM with an alleged history of road traffic accident, and on external examination, a lacerated wound was present over the forehead and face; all injuries were ante-mortem in origin. Blackish mud was present over both nostrils; fine, tenacious froth mixed with dirty water was coming out of the nose and mouth. On opening of the trachea, blackish mud and whitish froth mixed with dirty liquid were present. Both lungs were congested, voluminous and heavy and rib markings were present on the surface. The cause of death was declared as asphyxia due to ante-mortem drowning.

Case 6

A male aged 56 years died during treatment of 2 days in hospital, having a bruise over the left elbow and visible deformity of the left forearm, fracturing the radius. All injuries were ante-mortem in nature. The left side of the pleura contained about 300 mL of blood-stained fluid, and the right side of the pleura contained about 300 mL of blood-stained fluid. Both lungs were congested on dissection, and foul-

smelling, dark colored fluid mixed with pus was coming out. The cause of death was declared as complications of drowning, acute respiratory distress syndrome.

DISCUSSION

This case series illustrates both immediate and delayed fatalities following drowning secondary to an RTA. Ante-mortem drowning findings — such as fine froth from airways, voluminous heavy lungs with rib markings, and mud in the tracheobronchial tree — were consistently present in the five individuals who died on the scene.^{1,3}

The sixth case represents secondary drowning, wherein a delayed pulmonary response led to ARDS, sepsis, and death after hospitalization.^{2,4} This emphasises that drowning-related deaths may not always be immediate and can occur hours to days later due to evolving respiratory failure.

In road traffic accidents, blunt trauma injuries are commonly seen. Still, the injuries and cause of death can vary in different environmental conditions, as in these cases of RTA, the few non-fatal injuries were more. Still, the cause of death came to drowning and secondary drowning. While doing these kinds of cases, we should be able to; Differentiating primary trauma deaths from drowning, identifying drowning-specific features even in the presence of traumatic injuries, certifying cause of death accurately, particularly in complex RTA scenarios involving submerged vehicles.⁵

CONCLUSION

Road traffic accidents resulting in vehicle submersion can cause immediate drowning or delayed secondary drowning due to pulmonary complications. In forensic practice, awareness of such mechanisms is crucial for the accurate determination of the cause of death, especially when multiple factors like trauma and drowning coexist.

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