G75 A Case of a Death Related to Underwater Propeller at a Desalination Plant During Illegal Scuba Fishing

Benedetta Di Battista, MD, Stefano Derrico, PhD, and Cristoforo Pomara, MD, PhD, University of Foggia, Department of Forensic Pathology, Viale degli Aviatori 1, Foggia, 71100, ITALY*

The goal of this presentation is to show how injuries by propeller, amputation, and death by drowning are rarely reported events in forensic literature. A complete methodological approach with complete autopsy and histological study must be required as forensic approach to these cases.

This presentation will impact the forensice science community by educating them on a complete autopsy and histological study of all organ and surfaces of mutilated skin to determine the phases of death are of impact for attendees.

A self-contained underwater breathing apparatus (SCUBA) is often used in diving; it is practiced both as a sport and for some commercial activities. Most developed countries have legislation ensuring the safety of divers, but despite this, deaths are still recorded, especially among amateurs. In Puglia, many amateurs scuba dive for fishing for shellfish, such as mussels and clams, as well as octopus and bluefish. The most frequent cause of death, associated with this activity is drowning. In Italy, drowning occurs at a lower incidence than in others countries but is a highly lethal phenomenon. In almost half of the 800 events per year, the person involved dies (387 cases in 2007) and in the remaining 55% of the cases, people are hospitalized (near-drowning cases). Of these, it is estimated that in 2010 almost 10% occurred during SCUBA fishing expeditions. In contrast, propeller injuries are rare events and are thus seldom reported in the international forensic literature. According to a previous report, the frequency of propeller accidents is greater than 1 in every 20 boating accidents, and the fatality rate in propeller accidents is 15–23%.

Most propeller injuries occur at water recreational facilities such as those equipped for water skiing, boat racing, and skin and scuba diving. Injuries by propeller are typically multiple, deep, parallel lacerations that can result in permanent scarring, substantial blood loss, traumatic or surgical amputation, or death. Research has not shown any previous reports of injuries or reported deaths related to propellers from a desalination plant. This case study presents a scuba diver's death that occurred during an illegal scuba fishing trip in the vicinity of a desalination plant. During a scuba diving fishing trip at around 6:30 a.m., three scuba divers were fishing about 3-4m deep and about 30m away from the beach. One of the divers decided to fish close to the plant, probably attracted to the enormous quantity of "big mussels" attached onto the surface of the underwater parts of the desalination pump. After a sudden and unexpected start of the pump, a few minutes later, the other fishermen noticed a large, bloody patch in the water and then the lifeless body of their friend. They dragged him by swimming to the beach and then alerted local authorities.

An underwater scene investigation was conducted by an engineering team, studying the mouth of the pump and the dynamic characteristic of rotating propeller blades. An autopsy was performed the day after the death. The external examination of the body showed multiple amputations of arms and legs; a large bluish/red abrasion/contusion of the right thoracic wall extending to the superior part of the ipsilateral abdominal wall was also observed. Autopsy confirmed the complete sectioning of the right arm, the left forearm, and both ankles, and corresponding great vessels. A contusion of the thoracic soft tissue without any fractures was also noted. Examination of all other organs was unremarkable except for pulmonary and cerebral edema. Vessels were completely free of blood. Lungs were increased in volume and size, with few subpleural hemorrhagic spots. Mild cerebral edema with focal subcortical hemorrhagic spots and focal pulmonary edema associated with extended areas of atelectasia, acute emphysema and "ballonee" cells inside the alveolar spaces were observed at histological examination with standard H&E staining. Histological examination of the heart was unremarkable except for few foci of contraction band necrosis. Histological examination of the skin of the amputated surfaces revealed the presence of red cells on the derma.

In accordance with the data obtained, the dynamics of the fatal event were reconstructed and the cause of death was a result of drowning and massive hemorrhage due to propeller injuries.

Histological study of all organ and surfaces of mutilated skin to determine the phases of death (drowning and after mutilations of lifeless body?) must be required as forensic approach to similar cases.

The public implications of this event will be discussed especially in regards to criminal charges initiated against the owners of the desalination plant.

Amputation, Underwater Propeller, Scuba Fishing

 ** Presenting Author*