G118 Postmortem Examination of a High-Altitude, Diving-Related Fatality 17 Years After the Incident

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After attending this presentation, attendees will be familiar with the key elements of postmortem examination of diving-related deaths, understand the basic physics and physiology of SCUBA diving with an emphasis on the effects of altitude, and appreciate the importance of interpreting postmortem findings in the context of the events prior to death. They will also see a unique case of adipocere formation with remarkable preservation of the body and internal organs 17 years postmortem.

This presentation will impact the forensic science community by providing an example of a diving-related fatality due to an error in judgment in the setting of altitude diving.

Diving-related fatalities are rare occurrences. When they do occur, it is important for the forensic pathologist performing the postmortem examination to have an understanding of the physics and physiology of SCUBA diving and apply it to the circumstances surrounding the incident in order to determine the cause of death.

A body was discovered in Lake Tahoe, an alpine lake at a surface elevation of 6,225 feet in the Sierra Nevada mountain range. The body was found by recreational divers at a depth of 250 feet and brought to the surface by a robotic submarine. At the time of recovery, the body was clad in full dive gear, including a wetsuit with hood, gloves, booties, a buoyancy compensator vest with attached SCUBA tank and regulator, a 27-pound weight belt, and fins. The body was determined to be that of a 44-year-old male who had gone missing while diving with a friend 17 years earlier.

Postmortem examination revealed a partially skeletonized male with preservation of the torso and lower extremities by adipocere formation. No external evidence of antemortem trauma was identified. The internal organs were fairly well preserved due to encasement by adipocere, allowing examination of the cardiovascular system, lungs, liver, and kidneys. Moderate stenosis of the proximal left anterior descending artery was noted as well as mild calcific atherosclerosis of the abdominal aorta. Both lungs exhibited anthracotic pigmentation on the pleural surfaces.

Toxicology was performed on cardiac blood. Nicotine was detected, but there were no other positive findings of toxicological significance.

The equipment was sent to a dive expert and determined to be intact with the valve in the open position. Evaluation of the air mixture could not be assessed due to water in the tank, which appeared to have siphoned into the tank during his free-fall descent.

Review of the dive profile demonstrated that the divers were unfamiliar with altitude diving procedures. They dove to an actual depth of 100 feet with plans to stay at depth for a maximum of ten minutes. Approximately five minutes after arriving at depth, the friend noticed that his air supply was low, and he signaled to ascend. At a depth of 45 feet, he observed the decedent 25-30 feet below in free fall. He went after the decedent but was unable to remove the decedent's weight belt or put his mouthpiece into the decedent's mouth. At 130 feet, his air supply was significantly limited, so he returned to the surface alone. The buddy's equipment was examined at the time of the incident. Per the report, the equipment was functioning normally, but the 72-cubic-inch tank was empty.

After thoroughly reviewing the postmortem examination findings, toxicology, and dive profile, the cause of death was determined to be drowning due to cardiac arrest from lack of air while SCUBA diving with coronary artery atherosclerosis listed as a contributing factor.

This case exemplifies the need for the forensic pathologist performing a postmortem examination in a diving-related fatality to thoroughly review the dive profile, to be knowledgeable about the physics and physiology of SCUBA diving, and to seek expert consultation when needed in order to ensure that a correct cause of death is provided.

Diving, Fatality, Adipocere

 ** Presenting Author*