



PROCEEDINGS



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PROCEEDINGS
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190 When Immunohistochemistry Acquitted the Defendant: A Particular Scuba-Diving Death

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Learning Overview: This presentation will utilize results of immunohistochemistry to demonstrate the importance of this analysis in determining the cause of death following a fatal diving accident. After attending this presentation, attendees will better understand the importance of considering this kind of evidence and that immunohistochemistry can be decisive in the solution of some cases.

Impact Statement: This presentation will impact the forensic science community by showing that a thorough and standardized autopsy examination should always be desirable in order for the prosecutor to pass judgment.

A 53-year-old female diver was involved in an accident during a recreational dive to a maximum depth of 39 meters. The subject had many diving certificates and a long experience behind her, although she had suspended her diving activity for some years before the accident. She restarted directly with a deep dive. During the dive, she communicated some problems with the Buoyancy Control Device (BCD), and the dive was interrupted for safety reasons. During the ascent, the diver was reported to have lost the regulator from her mouth several times. The guides accompanied her to the surface. Upon leaving the water, the subject was cyanotic, with evidence of froth at mouth and nose. The diver was pronounced dead shortly after. An autopsy was ordered by the local prosecutor. The examination, performed by a first pathologist, observed: epicardial fat hyper-representation; patent coronary, with a small eccentric plaque in the descending branch of the left coronary artery, reducing the lumen by about 20%; myocardium was overall normal; smooth and shiny aorta, with small diffuse lipid plaques; no subpleural petechiae; clear, overexpanded lungs and, copious edema and bilateral congestion; negative docimasic test; fine hemorrhagic punctuation on the upper III of the tracheal mucosa; the stomach did not contain water but a few ccs of food liquid; and marked renal congestion. Barotrauma was indicated as the cause of death. The result was not considered decisive by the judge, who asked for a second opinion to determine the cause of death and any liability of the guides. Documentation was carefully examined anew by expert dive pathologists, together with photographic images and dive profiles.

It was decided that the histological samples with immunohistochemistry for CD61, serum anti-glycophorin, and desmin be examined. This technique made it possible to confirm the recurrence of the emphysematous appearance of the lungs due to laceration of the alveolar septa, widespread presence of platelet aggregates, fibrin, and heterogeneous thrombosis of the pulmonary microcirculation. Nothing was found in other body districts, excluding CID diagnosis, and thus proposing that the micro-thrombosis was the consequence of a slowdown of the microcirculation, which is well correlated to a primitive failure of the cardiac function. Other histological findings supported this hypothesis: the wall of the right ventricle with important fat replacement, atheromatous degeneration of the coronary wall, and widespread chronic pulmonary inflammation foci. Immunohistochemistry together with the examination of the documentation let the pathologists to define the causes of death and its natural manner. Barotrauma was thus ruled out as the primary cause of death. The public prosecutor asked for the acquittal of the guides, which the judge upheld.

Accident; Drowning; Histological