

H88 The Role of Histopathology Deaths Due to Pulmonary Thromboembolism in Forensic Cases

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Learning Overview: After attending this presentation, attendees will understand the role of histopathology in the postmortem evaluation of thromboembolism.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the need of correct histopathological investigations in order to clarify the time of embolism and any malpractice profiles.

Pulmonary embolism represents a cardiovascular emergency that can obstruct the pulmonary blood vessels and induce severe acute decompensation of the right ventricle even if potentially reversible. The diagnosis is difficult to formulate and may be overlooked due to an atypical clinical presentation. Unfortunately, the gold standard in its identification is the autopsy that allows us to investigate thromboembolic pathology as a cause of sudden death. A fundamental role beyond the autopsy is undoubtedly the histopathology that allows us to distinguish an embolus from a postmortem clot. Specifically, the importance of immunohistochemistry in the differential diagnosis is examined. After the macroscopic examination, the histological evaluation is necessary to observe the chronological changes of a thrombus.

In this study, a retrospective analysis of the autopsy, clinical and circumstantial data of 1,718 deaths was carried out, selecting among these only the cases in which the autopsy confirmed and/or highlighted a Thromboembolism (TE). Overall, 64 cases were selected to which two cases of judicial autopsies were added, for a total of 66 cases, 29 of which were males with an average age of 71 years and 37 were females with an average age of 77 years. Of the 66 cases of established Pulmonary Thromboembolism (PTE), only the cases in which the autopsy confirmed PTE as a cause of death and cases in which the PTE was found in the trunk of the pulmonary artery or in its branches were collected. From this selection, 22 cases were analyzed. For each case, a histological evaluation was performed with hematoxylin-eosin staining. More samples were taken at the proximal, intermediate, and distal levels, along the vascular tract of adhesion of the thrombotic material, evaluating the possible presence of different periods of formation of the thrombus. Fifty-six samples were obtained. In the immunohistochemical investigation, the markers used were: CD 15, CD 68, TNF, CD31, CD 34, P-selectin, α actin, collagen IV, and fibronectin. The results found that anti-CD15 and anti-CD 68 were positive in all tested samples; anti-TNF was positive in 70% of samples; anti-CD 31 was positive in 75% of samples; anti-CD34 was positive in 75% of samples; the anti-P-selectin antibody was negative in tested samples; the anti- α -actin was positive in 60% of samples; and the anti-collagen IV was positive in all the samples. This immunohistochemical analysis allowed, in all cases, to know the time of TE.

This study highlighted the importance of histological analysis of emboli with the examination of the wall of the blood vessel that contains it, thus avoiding removing it from the arterial branch where it is found. It is important to consider the time elapsed between death and autopsy and the time in which the body remains outside the cold room as the timing influences decomposition and the dating of thromboembolic material. In conclusion, the role of the autopsy with histological and immunohistological testing describes new methods for dating pulmonary thromboemboli.

Forensic Sciences, Histopathology, Thromboembolism