H109 An Autopsy Case of Pulmonary Embolism and Underlying Multiple Myeloma

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After attending this presentation, attendees will better understand how previously undiagnosed plasma cell neoplasm can contribute to fatal pulmonary embolism.

This presentation will impact the forensic science community by providing results from a case report in an area with very little previous research. This presentation will also add to research being conducted in forensic pathology by broadening the understanding of how undiagnosed plasma cell neoplasm can contribute to sudden death, enabling a better appreciation of these processes in death investigations.

Multiple Myeloma (MM) is characterized by the neoplastic proliferation of plasma cells producing a monoclonal immunoglobulin.[1] The diagnosis of MM requires clonal bone marrow plasma cells ≥10% or biopsy-proven bony or soft tissue plasmacytoma plus either the presence of related organ or tissue impairment or the presence of a biomarker associated with near-inevitable progression to end-organ damage.[2] Pulmonary embolus refers to obstruction of the pulmonary artery or one of its branches by thrombus.

A 62-year-old Black male with a past medical history of back pain, obesity, hypertension, and diabetes had a witnessed "falling out" in which he fell backward and became unresponsive. After Emergency Medical Services (EMS) arrival, he was found in pulseless electrical activity. The patient was pronounced dead soon after his arrival at the hospital. The most remarkable gross autopsy findings were bilateral thromboemboli in main, segmental, and subsegmental pulmonary arteries. Microscopically, the histology of vertebral bone showed hypercellular (90%) for the age bone marrow with the majority of the cells being atypical plasma cells. Immunohistochemical stains revealed cells of interest being positive for CD138, light chain lambda, and immunoglobulin G. Protein electrophoresis of postmortem blood showed the presence of M-spike and 1g/dl paraprotein and serum immunofixation exhibited IgG Lambda paraprotein in the gamma region.

In conclusion, this report provides evidence that even when the cause for sudden death is obvious grossly, some routine histology may provide valuable information about the underlying disease. In this case, myeloma significantly contributed to the fatal embolic event by the production of a hypercoagulable state. It was observed that in patients with newly diagnosed and untreated myeloma, increases in Von Willebrand factor and factor VIII and a decrease in protein S levels result in a hypercoagulable state which may promote the development of thrombo-embolic complications.[3]

Reference(s):

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2. Rajkumar S.V., Dimopoulos M.A., Palumbo A., et al. International Myeloma Working Group updated criteria for the diagnosis of multiple myeloma. *Lancet Oncol*. 2014; 15:e538.
3. Auwerda J.J.A., Sonneveld P., De Maat M.P.M., Leebeek F.W.G. Prothrombotic coagulation abnormalities in patients with newly diagnosed multiple myeloma. *Haematologica*. 2007;92(2):279–280.

Multiple Myeloma, Pulmonary Embolism, Sudden Death