

H23 The Role of Autopsy in COVID-19 Disease

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Learning Overview: After attending this presentation, attendees will understand the role of autopsy in COVID-19 disease.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the crucial role of postmortem examination in infectious disease.

The autopsy has played an important role in the study of pathologies. The recent spread of the COVID-19 pandemic is presenting a real challenge for society and health care workers in all sectors. The restrictive measures adopted during the lockdown limited many aspects of personal and family life. The ministerial circulars prohibited the exposure of COVID-19 infected bodies, recommending the immediate closure of the body. Many bodies, at the time of death, were subjected to cremation. Consequently, during the pandemic, many families were unable to see the bodies of their loved ones or carry out funerals, resulting in strong direct and indirect psychological effects. Despite ongoing research, little is known today about the pathological changes of SARS-CoV-2 virus on the body.

During the health emergency, the Forensic Medicine Operating Unit of the “Magna Graecia” University of Catanzaro carried out research aimed at studying the effects of the SARS-CoV-2 virus at autopsy. All deceased patients were examined. The period of hospitalization, medical records, comorbidities, possible complications during hospitalization and cause of death were evaluated for each decedent. All decedents were then subjected to nasal and oropharyngeal swabs. Some of them were also subjected to diagnostic tests and endobronchial swabs.

A total of 20 decedents who were positive for the SARS-CoV-2 virus in life and later died at the Germaneto University Hospital were examined. At the level of the other organs, histiocytosis was noted above all of the spleen with thrombotic areas of the intra-parenchymal vessels.

As part of this study of swabs taken in the postmortem period, some decedents still had a positive Polymerase Chain Reaction (PCR) test for SARS-CoV-2 even 24 hours after death in nasopharyngeal and endo-bronchial swabs.

All autopsies showed a hypercoagulation picture with intravascular thrombo-emboli and features of Disseminated Intravascular Coagulation (DIC). All cases also showed lobar pulmonary fibrosis, in particular at the bases with areas of secondary bacterial infections and pulmonary hepatization with abscess formation. The presence of megakaryocytes was noted in capillaries with endo-alveolar hemorrhagic extravasations and scarring areas. The hilar, paraesophageal, and paratracheal pulmonary lymph nodes demonstrated reactive lymphadenopathy. There was an increase in the density of the bile with gelatinization of the same and degeneration of the hepatic parenchyma. Histiocytosis was noted in the spleen. Additional pulmonary pathology included diffuse alveolar rupture, large areas of pulmonary necrosis due to thrombi, some of which demonstrated evidence of recanalization, early fibrosis, fibrous thickening of alveolar septae, foamy macrophages, and focal hyaline membranes.

Finally, molecular investigations were launched to understand virus-induced genetic mutations that generated the hypercoagulation and subsequent pulmonary thrombo-embolism or hemorrhages associated with DIC. This information allowed multidisciplinary comparison with the COVID-19 Operating Units of the Germaneto University Hospital, both in relation to the effects of the disease and the effectiveness of therapies being used.

Forensic Sciences, Autopsy, COVID-19