G37 Postmortem Pulmonary Findings by Computed Tomography Compared With Conventional Autopsy

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After attending this presentation, attendees will improve their knowledge about interpretation of postmortem CT scanning images of the lungs and to distinguish them from pathological changes developed before death.

The presentation will impact the forensic science community by demonstrating an important contribution to the new practical knowledge that the forensic pathologist should know regarding the role of CT scanning in autopsy (virtopsy) with reference to the new ACCME criteria.

Postmortem CT scanning (PMCT) is becoming an increasingly important supplement to the medicolegal autopsy. It contributes significantly to the description of skeletal lesions, thereby clarifying the mechanisms of trauma. Gas and foreign bodies are readily identified, and it provides insight in the process of decomposition, in case of which visualization of organs such as the brain is also improved. Interpretation of the CT images acquired from dead people is in many ways different as compared to living people. Evidently, the circulation stopped, resulting in reduced blood filling in the arterial system and sedimentation of blood and other body fluids in the soft tissues. Decomposition of the body begins and is clearly visible as air formation in the soft tissues at a very early stage. It can be difficult to discern the various postmortem changes from pathological conditions in the organs and other soft tissues, especially because experience with PMCT is very limited in contrast to the widespread knowledge in clinical CT scanning.

The purpose of this study was to compare the findings in the lungs by PMCT with the findings and diagnosis made by conventional autopsy, and to learn how to identify common postmortem changes in the lungs in PMCT and to distinguish them from pathological changes developed before death. Internal lividity can be present in all organs, but they are easier to recognize in the lungs both at the autopsy table as well as on PMCT images, because the presence of air in the lung tissue acts as a contrast to the denser appearance of blood and tissue. Internal lividity of the lungs is often seen in the posterior parts due to the frequently supine positioning of the body. In many cases, internal lividity is easily recognized as such. However, differential diagnoses should always be considered, e.g. pneumonia, edema, contusion, and infarction.

The material consisted of 100 forensic cases which were autopsied in 2008-2009 at the Institute of Forensic Medicine, preceded by PMCT by using an in-house Siemens Definition 64 slice scanner. Whole-body scanning was performed in all cases. The torso scanning was obtained with 140 kV and 500 mAs; a beam collimation of 1 mm and pitch 0.75. From the PMCT data axial images were made using different algorithms (H20S smooth and H60S sharp) provided by the manufacturer. Evaluation of the axial images was supplemented by secondary multiplanar reconstructions obtained with available software at the workstation. The PMCT images were initially evaluated by an experienced forensic pathologist and in selected cases a senior radiologist with postmortem radiology experience also evaluated the images. Following the initial evaluation all thoracic axial slices obtained in each of the cases were reviewed by the authors in order to complete a detailed description of the lungs with respect to internal lividity and pathological findings, using the standard settings for viewing of the lungs (window width 1200 HU, center -600 HU) and the mediastinum (window width 400 HU, center 40 HU). The results of the PMCT were compared with the macro- and microscopic findings at autopsy.

The results will be presented and discussed.

Postmortem CT Scanning, Virtopsy, Lung Pathology

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