H83 Postmortem Changes on Computed Tomography (CT) Can Assist With the Diagnosis of Biliary Tract Disease

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After attending this presentation, attendees will gain an appreciation for some of the differences in postmortem imaging and clinical diagnostic imaging; specifically, the impact of postmortem artifacts and changes on diagnosis and forensic examination.

This presentation will impact the forensic science community by illustrating a technology-based example of forensic theory — namely that, in some circumstances, the changes that occur and progress after death (as visualized on postmortem Computed Tomography (CT)) can be the key to stepping backward to determine how and why some people die.

Postmortem changes such as hypostasis in the lungs, hematocrit effect in the dural sinuses, and air collections caused by gas-forming organisms can be distracting to pathologists and radiologists assessing Postmortem Computed Tomography (PMCT) images. Much like postmortem artifacts on gross examination, these findings can obscure, mimic, or be intensified by real pathology. It is important for forensic pathologists to know the difference and be able to draw inference from these findings in order to reinforce their conclusions.

Reported are two cases of sudden unexpected death where biliary tract disease was suspected by localized gas collections following PMCT and confirmed at autopsy. The first involved a 70-year-old woman with a short history of bilious vomiting with sudden collapse. In another case, a 55-year-old man was found dead sitting upright in his bathtub. At the time of discovery, he was slumped over, but his face was not submerged. For two days he had not been feeling well, but did not seek medical attention. In both cases, the postmortem interval to CT was less than ten hours.

Dramatic pneumobilia was noted on PMCT of both cases in the absence of putrefactive changes elsewhere. The first case also showed an obstructive pattern in the small bowel with dilatation and air-fluid levels and, on further examination, a large obstructing ovoid structure was seen in the jejunum. Gallstone ileus was confirmed at autopsy with a fistula between the gallbladder and duodenum. Pneumobilia is attributed to gas from the small bowel gaining access to the biliary tract. In addition to pneumobilia, the second case showed fat stranding in the vicinity of the gall bladder bed, but no other significant findings. The common bile duct was dilated and ascending cholangitis was detected by histology. Pneumobilia in this case is attributed to fermenting processes of gas-forming organisms in the biliary tract.

These cases illustrate the fact that not all postmortem changes seen on CT imaging should be discounted. Occasionally, regional differences in postmortem changes or artifacts can be leveraged to guide specialized dissection and sampling at autopsy. For this reason, postmortem changes must be assessed in the context of the clinical history, external examination, the postmortem interval, their extent and localization in the body, as well as the internal autopsy findings.

Postmortem CT, Forensic Pathology, Postmortem Artefacts