

Can post mortem CT reliably distinguish between drowning and non-drowning asphyxiation? A prospective study

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Purpose: To document and confirm post mortem CT findings in bodies recovered from water after drowning. **Materials & Methods:** We performed a prospective, comparative study of post mortem CT-scans obtained for medico-legal purposes in a 2 year interval. All CT-examinations were performed on a 64-slice MDCT-scan. Case inclusion criterion (n=14): body recovered from water with clear circumstantial evidence of drowning. Control inclusion criterion (n=11): body with autopsy confirmed, non-drowning asphyxiation. Images were evaluated for the presence of fluid in the paranasal sinuses (FPS), mastoid air cells (FMA) and lower airways (FLA), frothy foam in upper airways (FFUA), ground-glass opacity (GGO) within the lungs, the level of the right hemi-diaphragm, interpulmonary distance at the level of the aortic valve (IPD), the area of the esophagus at the carina (AAE), the mean density of intracardiac blood (MDICB) gastric (MDGC) and esophageal contents (MDEC). **Results:** The following observations were made in cases and controls respectively: FPS: 92.9% vs. 77.8%; FMA: 14.3% vs. 20%; FLA: 85.7% vs 66.7%; FFUA: 7.1% vs. 36.4%; GGO: 90% vs. 88.9%. The MDICB was 61.9 HU in cases and 57.1 HU in controls. The MDGC was 15.9HU in cases and 13.1 HU in controls. The MDEC was -111.5 in cases and -33.3 HU in controls. The mean IPD at the cardiac level was 8.9 mm in cases and 17 mm in controls. The mean AAE was 1.3 cm² in cases and 1.1 cm² in controls. The average position of the right hemi-diaphragm was at the level of the 5th rib in cases and the 4th rib in controls. **Conclusion:** Our provisional results indicate that it is very difficult to distinguish drowning from non-drowning asphyxiation on CT. Only the level of the right hemi-diaphragm differed significantly ($p < 0.05$). CT-indicators for drowning as the cause of death should be defined with caution