



Virtual autopsy as an alternative to traditional medical autopsy in the intensive care unit: a prospective cohort study

Wichmann D, Obbelode F, Vogel H, Hoepker WW, Nierhaus A, Braune S, Sauter G, Püschel K, Kluge S

Abstract: Background: Autopsy is an important educational and quality control tool in the intensive care unit, but rates of traditional medical autopsies have declined worldwide. “Virtual” autopsy involving only advanced radiographic techniques might provide an alternative approach to post-mortem examinations. Objective: To assess the value of post-mortem multidetector computed tomography as an alternative to medical autopsy. Design: Prospective cohort study. Setting: Nine intensive care units in a single academic medical center. Consent for both medical and virtual autopsies was sought from the families of all consecutive patients dying in intensive care between January 1st and June 30th, 2010. Clinical records were reviewed to determine whether unsuspected autopsy findings would have altered care if known (‘major’) or not (‘minor’). Results: Of 285 patients, 47 underwent both virtual and medical autopsy. Of 196 clinical diagnoses made prior to death, 173 (88%) were identified by virtual autopsy and 183 (93%) by medical autopsy. 14 new major and 88 new minor diagnoses were detected by any autopsy method. The main diagnoses missed by virtual autopsy were cardiovascular events (9 of 72) and malignancies (12 of 30). In contrast, medical autopsy missed 13 traumatic fractures and 2 pneumothoraces. Among 115 additional patients on whom only a virtual autopsy was performed, by which 11 new major diagnoses were made. Limitations: Virtual autopsy was performed in only 57% of patients (n=162), among whom consent for traditional medical autopsy was obtained in only one third. Conclusion: Virtual autopsy may be useful in identifying diagnoses which traditionally have been identified by medical autopsy. This may also hold true at least in part for the educational aspect of medical autopsy of confirming ante-mortem clinical diagnoses. Further studies are required to confirm these preliminary results. (ClinicalTrials.gov number, NCT01040520).

Statement: The virtual autopsy is a newly developed procedure that will enhance the classic autopsy, giving it the capacity to achieve more reliable results. In some cases, the virtual autopsy could also replace the normal autopsy. This is the first study investigating virtual autopsy in a large cohort of non-forensic patients. Clearly, the introduction of this new autopsy method is likely to have a major impact on forensic medicine, the judicial system, and general medicine in the future

Our research work was performed as an interdisciplinary project at the Departments of Intensive Care Medicine, Legal Medicine and Pathology. The three main researchers were Stefan Kluge, Klaus Püschel and Dominic Wichmann. Primary Funding Source: University Medical Center Hamburg-Eppendorf.