G62 Postmortem CT Angiography as a New Tool in Medical Education and Clinical Research

Jochen M. Grimm, MD, JD, Nussbaumstr. 20, Munich, GERMANY; Christine Chevallier, Patrice Mangin, MD, PhD, and Beat Riederer, PhD, University Center of Legal Medicine Lausanne, Rue du Bugnon 21, Lausane, SWITZERLAND; Valentin Djonov, PhD, Baltzerstrasse 3, Bern, SWITZERLAND; and Silke Grabherr, MD, University Center of Legal Medicine Lausanne, Romand de Médecine Légale, Rue du Bugnon 21, Lausanne, SWITZERLAND*

After attending this presentation, attendees will understand the role of postmortem angiography in medical education, advanced medical training, and in clinical research as well as the need for close interdisciplinary collaborations of postmortem and clinical medicine.

This presentation will impact the forensic science community by showing how the performance of a postmortem CT angiography can increase the quality of medical teaching in anatomy and highlight the impact of postmortem perfusion on clinical research and advanced medical training.

In postmortem investigations, radiological cross sectional imaging techniques such as Multi-Detector Computed Tomography (MDCT) have already found a place in many medicolegal institutes. More complex methods such as Postmortem CT Angiography (PMCTA) have been introduced in the last years. In order to increase practicability and reproducibility of this kind of exam, a standardized technique called Multi-Phase Postmortem CT Angiography (MPCTA) has recently been developed. This technique consists of a native CT scan followed by three angiographic phases (arterial, venous, and dynamic phase). The vascular system is hereby investigated in a minimally invasive way by cannulating the femoral artery and vein of one side, connecting these cannulas to a perfusion device and injecting a mixture of paraffin oil and contrast agent before and during CT scanning. Adequate technology for performing this examination, including a specialized perfusion device and contrast agent, has recently been developed in Switzerland. The new technique has already been proofed as being a sensitive tool for detecting vascular lesions and to increase significantly the quality of postmortem investigation when it is combined with conventional CT.

But the need for a reliable radiological demonstration of the vascular system has also increased in the field of medical education and advanced medical training. The goal of this presentation is to show the interest of postmortem angiography as a new tool in medical teaching and clinical research and to underline the importance of close collaboration between postmortem disciplines (legal medicine, pathology, anatomy) and clinical research.

Anatomical education for medical students: Human bodies foreseen for anatomical preparation courses have been examined by native CT, magnetic resonance imaging, and PMCTA using the technique of MPCTA. Thanks to the installation of computer displays in the autopsy-room, medical students are now able to compare the radiological data of the investigated body with the topographic anatomy of the same body during dissection courses. As a rsesult PMCTA, the vascular topography can be studied in detail. After the dissection course, anatomical cross sectional preparations have been fabricated which can be compared to the cross sectional radiological images.

In the context of clinical anatomy, the same radiological techniques have been used in order to develop and validate new diagnostic methods and surgical techniques. In fact, for multiple clinical studies, the knowledge of the exact vascular anatomy which can be explored on human bodies by PMCTA is essential. For other studies, the establishment of a postmortem circulation is of interest. Such a circulation can be obtained by using the equipment which has been developed for medicolegal PMCTA. Once a postmortem circulation has been built up, different surgical techniques can be tested on bodies under nearly "*in-vivo* conditions." Even the performance of interventional vascular examination becomes possible. Without vascular perfusion, such interventions are impractical due to a collapsed vascular system.

The actual development of postmortem imaging and clinical anatomy leads to an increasing demand of interdisciplinary collaboration between different medical fields. This presentation will point out this need and show possibilities for such collaborations. It also demonstrates that a technique, which has initially been developed for forensic purposes, can gain an important impact on teaching and clinical research.

Forensic Radiology, Medical Education, Clinical Research

 ** Presenting Author*