G87 Postmortem CT-Angiography Using Angiofil®

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After attending this presentation, attendees will know how to perform a postmortem CT-Angiography using Angiofil®, will understand the differences between this technique and other techniques of postmortem angiography, and will understand the advantages and limitations of postmortem angiography.

This presentation will impact the forensic science community by presenting a new technique of postmortem angiography which has the potential to be largely used for postmortem radiological examinations. The perfusion machine and other technical materials developed for the method as well as a standardized protocol makes it easy applicable and therefore interesting for postmortem examiners.

Postmortem CT-angiography using Angiofil® is a minimally- invasive technique that allows to map the vascular system of a decedent in detail and therefore to perform vascular diagnosis similar to clinical CT-angiography.

Synopsis of Contents: *Preparation of the corpse:* To perform the postmortem CT-angiography, the body is placed on the CT-table. There, a small incision is made in the inguinal region to prepare the femoral vessels. Cannulas are inserted into the vascular lumina, and connected with the tubes of a special perfusion machine.

Perfusion Machine: In the University Center of Legal Medicine Lausanne and Geneva, a special perfusion machine has been developed that is easy to handle. Its special software gives further information about the pressure measured in different regions of the vascular system and these parameters provide some information about the conditions of the investigated vessels.

Contrast Agent: Angiofil® is a mixture of paraffin oil and iodized linseed oil. Thanks to the hydrophobic abilities of this oily contrast agent, no extravasation through the intact vascular wall is observed. Therefore, infiltratation of the surrounding tissue is avoided. This is important to increase the quality of the procedure and to avoid deformation of the investigated body as it happens when using aqueous contrast agents, especially when important quantities of aquaeus contrast agent are injected.

Technique of the Angiography: To start the angiographic examination, the cannulas are inserted into the femoral vessels and connected with the tubes of the perfusion machine. The examination consists of different phases. As a first step, the arterial phase of

angiography is performed. The perfusion machine is started and Angiofil® is introduced into the vascular system, entering by the femoral artery. To demonstrate the venous part, the contrast agent is injected by the femoral cannula and a further CT-acquisition is started.

As a third step, one or more further CT-acquisitions can be performed after establishing a “postmortem circulation”. Hereby the contrast agent is flowing from the arterial into the venous system and quits the vascular system by the femoral vein.

Conventional autopsy: In the University Center of Legal Medicine Lausanne and Geneva the radiological findings are compared with those obtained by conventional autopsy. This procedure is important to verify the angiographic diagnoses and to define advantages and limitations of the angiographic examination.

Results: By performing a dynamic postmortem CT-angiography, the vascular system can be visualized in detail. Vascular pathologies such as ruptures of vessels, aortic dissection and cardiac tamponade can be diagnosed. By comparing the different phases of angiography, information about the rapidity of extravasation and therefore about the quantity of blood loss can be gained.

However, problems persist in the diagnosis of thrombosis and embolism, since postmortem clots have the same appearance on CT-images.

Conclusion: Postmortem dynamic CT-angiography is of great interest in forensic pathology, because the detailed mapping of the entire vascular system is almost impossible with conventional autopsy tools. The presented method and the use of the recently developed perfusion machine allow postmortem angiography in an easy and standardized way. The new method using Angiofil® as a contrast agent allows to investigate blood vessels under pressure similar to real life conditions without creating artifacts due to extravasations and therefore without deforming the corpse. By performing different phases of angiography, information about the relation between the quantity of blood loss and time can be gained.

Postmortem Angiography, Forensic Radiology, Postmortem CT

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