E44 A Rare Case of Fatal Anaphylactic Reaction Following the Application of Gadobutrol, a Gadolinium-Based Contrast Agent, for Contrast-Enhanced Magnetic Resonance Imaging (MRI)

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The goal of this presentation is to sensitize forensic pathologists (and clinicians) to the fact that fatal anaphylactic reactions cannot only occur after application of a Computerized Tomography (CT) contrast agent which is generally well known, but also after application of an MRI contrast agent. For the forensic pathologist, it is a rare but important cause of death to be considered in forensic investigations.

This presentation will impact the forensic science community by expanding professional knowledge beyond the general known causes of anaphylactic reactions by discussing a rare trigger of a fatal anaphylactic reaction. Adverse drug reactions in gadobutrol in general have a very low incidence of 0.55%-3.5% and there are even fewer cases of fatal anaphylactic reactions; however, if an anaphylactic reaction occurs, it can present itself with a fulminant course within minutes. Even in a medical setting with highly trained professionals, the outcome can be fatal.

The rare case of a fatal anaphylactic reaction to gadobutrol, a MRI contrast agent, in a 42-year-old male is presented.

The patient underwent elective MRI for diagnostic clarification of a suspicious kidney tumor. He had undergone contrast-enhanced computed tomography previously without occurrence of any adverse effects. A few seconds after the application of the MRI contrast agent gadobutrol, the patient felt unwell and complained of nausea and dypnoea. With the suspected diagnosis of an allergic reaction, he was immediately administered an ampoule of the antihistamine clemastine, the H2-receptor-antagonist ranitidin and the glucocorticoid dexamethasone intravenously. Yet, within minutes, he went into cardiac arrest. Even though resuscitation measures were started immediately and successfully, he died two days after the event due to ischemic brain damage. In the blood samples obtained upon admission to the hospital, the enzyme tryptase was elevated several times higher than normal. Autopsy showed massive brain edema. Cause of death was paralysis of the respiratory system due to brain edema following the lack of oxygen resuscitation measurements as a consequence of anaphylactic reaction to the MRI contrast agent gadobutrol. There were no indications of medical or third-party negligence.

Anaphylactic reaction to an MRI contrast agent is very rare, but can take a relentless course within minutes of occurrence. Even in a medical setting with highly trained professionals, the outcome can be fatal.

Forensic pathologists have to keep in mind that fatal anaphylactic reactions can also occur after application of an MRI contrast agent. Clinicians should understand that even during MRI examinations, fatal accidents can occur and resuscitation equipment as well as a well-trained staff must be immediately available at all the times.

Fatal Anaphylactic Reaction, MRI Contrast Agent, Gadobutrol