



### H83 A Fatal Dental Extraction: A Case of Ceftriaxone-Induced Anaphylactic Shock in an Inmate

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**Learning Overview:** The goal of this presentation is to underline the role of immunohistochemical technique and to estimate serum concentration of mast cell tryptase as a specific marker to determine the cause of death during suspected anaphylactic shock.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by emphasizing the importance of an accurate anamnesis and to give the patient a detailed explanation of the risks of procedures and the possibility of Ceftriaxone (CTR<sub>X</sub>) anaphylaxis. It is important to conduct an exhaustive immunohistochemical study, with anti-tryptase antibodies and measuring allergen-specific IgE in blood samples from the corpse to indicate sensitivity to certain allergens in order to obtain a reliable postmortem diagnosis.

CTR<sub>X</sub> is a third-generation cephalosporin commonly used for bacterial infections. The incidence of CTR<sub>X</sub>-related hypersensitivity skin reactions is between 1% and 3%, whereas anaphylaxis is rare. Although CTR<sub>X</sub> is a frequently used antibiotic, only a few cases of anaphylaxis in response to the first dose of CTR<sub>X</sub> have been reported. A case of anaphylactic shock after a single dose of CTR<sub>X</sub> without previous exposure to the drug is presented. Signs and symptoms of anaphylaxis are variable and can range from mild skin lesions to fatal reactions. It is generally quite difficult to prevent anaphylaxis, although effective advanced life support and postresuscitation care may improve survival.

The following case concerns a sudden death due to intramuscularly administered CTR<sub>X</sub> after a dental extraction in an inmate. Physicians did not collect an accurate anamnesis and did not offer a detailed explanation about the risks of this drug before injection, about any procedures offered, and precautionary measures before and during the dental extraction.

**Case Report:** A 35-year-old male convict with a medical history of allergic asthma, celiac disease, and known food-induced allergies for fish, fresh milk, peanuts, hazelnuts, walnuts, apples, kiwis, and peaches underwent a dental extraction with intramuscular CTR<sub>X</sub> administration. A few minutes after CTR<sub>X</sub> administration, he suddenly collapsed. Advanced life support with intramuscular adrenaline and resuscitation maneuvers were unsuccessful. Postmortem examination was unremarkable. At the autopsy, gross examination showed mild cerebral edema and white foam in the main bronchi. Lungs were normal in shape, increased in volume and weight, and exhibited small subplurular petechiae. Histological examination revealed polivisceral stasis and mild cerebral edema. Myocardial interstitial edema was also detected. An immunohistochemical technique was used to estimate the mast-cell population using the anti-tryptase antibody as a mast-cell specific marker. A considerable number of degranulating mast cells with extracellular tryptase-positive material were observed. Histological and immunohistochemical (CD4, CD15, CD68, CD20, CD3, CD8, and CD45) investigation of brain specimens revealed a diffuse cerebral edema. Lung samples showed subpleural and interstitial hemorrhage, intra-alveolar and diffuse interstitial edema, and acute stasis. The analysis of other organs was unremarkable. The goal was to detect IgE specific for CTR<sub>X</sub>. A serum concentration of mast cell tryptase from femoral blood was 41.4ug/l. The laboratory tryptase enzyme immunoassay on blood revealed a tryptase concentration of 136.50mcg/L (n.v. 0.00–15.00mcg/L), greater than the cut-off value of 45µg/l for the diagnosis of anaphylactic shock. The death was attributed to an anaphylactic shock due to CTR<sub>X</sub>, after his very first dose.

#### Ceftriaxone, Anaphylactic Shock, Dental Extraction