



### **K30 An Unusual Circumstance of Internal Chemical Burn Injury: A Case Report**

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After attending this presentation, attendees will understand the injuries due to a rarely reported case of chemical burns due to ingestion of nitric acid in which the history was not of an accidental but of a suicidal nature.

This presentation will impact the forensic community by helping in formulating an emergency treatment protocol.

The present case describes the macroscopic findings of vital changes seen in patient due to ingestion of nitric acid is also highlighted. Spillage of nitric acid (vitriolage) is frequently reported especially in the third-world countries, but an ingestion injury due to nitric acid injuries are seldom encountered in routine practice.

Nitric acid, also known as aqua fortis (strong water) or spirit of nitre or engraver's acid<sup>1</sup> is a chemical important for industrial and domestic purposes. A strong acid, powerful oxidizing agent and an ability to nitrate organic material make it an essential in the production of numerous chemicals. Skin contact leads to severe burns and its vapours can cause severe acid burns to the eyes, respiratory tract, and lungs. Being a corrosive, it produces immediate pain and causes burns of mouth, throat, esophagus and abdomen, widespread gastroenteritis, and bloody diarrhoea. Blood may also be found in urine.

A 55-year-old female unable to face the problems of life, ingested an acid around 11:00 a.m. in the morning. She was brought in with complaints of pain and burning sensation and thereby was admitted to a private medical hospital around 3:00 p.m. the same afternoon. She was a known diabetic. Following admission, the patient had undergone laboratory tests which revealed red colored urine (haematuria), proteinuria, aciduria (low urine pH), and pyuria suggesting signs of poisoning and later septic shock.

Amorphous calcium oxalate crystals were also found in urine. Serum electrolytes and other routine investigations were normal. Liver function tests (LFT) showed raised liver enzymes (SGOT = 91, SGPT = 46). Peripheral smear showed a total count of 22,300 (N92 L7 M1) which is a sign of acute inflammation and perforation. This was later confirmed with an abdominal X-ray showing pneumo-peritoneum.

The patient's condition deteriorated after two hours. Arterial blood gas analysis showed acidosis with a pH of 7.1. Serum electrolytes showed variation (serum potas- and whitish tinge of teeth was seen).

Unlike sulphuric acid, when concentrated nitric acid is ingested, the tendency to produce charring of tissues and then perforation is a rare event as recorded in the present case. It may be said that acid burn injuries represent only a minute percentage of burns, but they cause a particular type of lesion in which the morbidity is high and death is certain.

This case presents as an unusual circumstance of an internal burn injury caused due to nitric acid, a rare event, made more so by being used as an agent for suicide. It is recommended that medico-legal death investigators become familiar with the internal chemical burn injuries due to nitric acid.

#### **Chemical Burn Injury, Nitric Acid, Nitric Acid Ingestion**